

AGENDA

Meeting **Health and Environment
Committee**

Date **Wednesday 12 September 2012**

Time **2.30 pm**

Place **Committee Room 5, City Hall, The
Queen's Walk, London, SE1 2AA**

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Members of the Committee

Murad Qureshi (Chair)

Jenny Jones (Deputy Chair)

James Cleverly

Nicky Gavron

Stephen Knight

Kit Malthouse

Onkar Sahota

Fiona Twycross

[Vacancy]

A meeting of the Committee has been called by the Chair of the Committee to deal with the business listed below. This meeting will be open to the public. There is access for disabled people, and induction loops are available.

Mark Roberts, Executive Director of Secretariat
Tuesday 4 September 2012

Further Information

If you have questions, would like further information about the meeting or require special facilities please contact: Camelia Thomas, Committee Officer; Telephone: 020 7983 4795; email: camelia.thomas@london.gov.uk; Minicom: 020 7983 4458. For media enquiries please contact: Lisa Moore, Tel: 020 7983 4228, email: lisa.moore@london.gov.uk.

If you have any questions about individual reports please contact the report author whose details are at the end of each report.

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Certificate Number: FS 80233

**Agenda
Health and Environment Committee
Wednesday 12 September 2012**

1. Apologies for Absence and Chair's Announcements

To receive any apologies for absence and any announcements from the Chair.

2. Declarations of Interests (Pages 1 - 2)

The Committee is recommended to:

- (a) Note as disclosable pecuniary interests the list of memberships of functional bodies and London Borough Councils, as set out in the table at Agenda Item 2;**
- (b) Declare any disclosable pecuniary interests in specific items listed on the agenda and take any necessary action regarding withdrawal following such declaration(s); and**
- (c) Additionally declare any relevant interests (including any interests arising from gifts and hospitality received which are not at the time of the meeting reflected on the Authority's register of gifts and hospitality, and noting also the advice from the GLA's Monitoring Officer set out at Agenda Item 2) and take any necessary action regarding withdrawal following such declaration(s).**

3. Minutes (Pages 3 - 112)

The Committee is recommended to confirm the minutes of the meeting of the Health and Environment Committee held on 3 July 2012 to be signed by the Chair as a correct record.

The appendices to the minutes set out on pages 7 to 112 are attached for Members and officers only but are available from the following area of the GLA's website:

<http://www.london.gov.uk/moderngov/mgCommitteeDetails.aspx?ID=256>

4. Summary List of Actions (Pages 113 - 306)

Report of the Executive Director of Secretariat
Contact Camelia Thomas, camelia.thomas@london.gov.uk 020 7983 4415.

The Committee is recommended to note the completed and outstanding actions arising from previous meetings of the Committee.

5. Update on NHS and Public Health Reform in London (Pages 307 - 310)

Report of the Executive Director of Secretariat
Contact Carmen Musonda, carmen.musonda@london.gov.uk 020 7983 4351.

The Committee is recommended to note the report as background to hearing from and putting questions to invited experts.

6. Tackling Childcare Affordability in London - Next Steps (Pages 311 - 324)

Report of the Executive Director of Secretariat
Contact Carmen Musonda, carmen.musonda@london.gov.uk 020 7983 4351

The Committee is recommended to:

- (a) Note the responses to the predecessor Health and Public Services Committee's report, *Tackling childcare affordability in London* received from the Department for Work and Pensions, the Department for Education, the Mayor, and London Councils; and**
- (b) Agree the follow up action set out in paragraphs 4.2 and 4.3 of the report.**

7. Playing Fields Update (Pages 325 - 338)

Report of the Executive Director of Secretariat
Contact Ian Williamson, ian.Williamson@london.gov.uk 020 7983 6541.

The Committee is recommended to:

- (a) Note the information received from Sport England and the other developments on playing field availability and protection set out in this report; and**
- (b) Authorise the Chair, in consultation with Party Group leads, to write to Sport England expressing the Committee's views and in particular to seek information on what is being done to protect or monitor a number of playing fields in London identified by Sport England as being at-risk.**

8. Briefing on the Government's Draft Aviation Policy Framework (Pages 339 - 342)

Report of the Executive Director of Secretariat

Contact Carmen Musonda, carmen.musonda@london.gov.uk 020 7983 4351.

The Committee is recommended to:

- (a) Agree the suggested guests and approach to the discussion on the Government's draft Aviation Framework, focusing on noise and climate change impacts; and**
- (b) Agree to submit a response to the Government consultation on the draft Aviation Policy Framework.**

9. Proposal for a Rapporteurship Review of Food Poverty in London (Pages 343 - 350)

Report of the Executive Director of Secretariat

Contact Richard Derecki, richard.derecki@london.gov.uk 020 7983 4899

The Committee is recommended to agree to recommend to the GLA oversight Committee the appointment of Fiona Twycross AM as a rapporteur to carry out a review of Food Poverty in London with the terms of reference as outlined at paragraph 4.1 of the report.

10. Domestic Retrofit (Pages 351 - 354)

Report of the Executive Director of Secretariat

Contact Ian Williamson, ian.Williamson@london.gov.uk 020 7983 6541.

The Committee is recommended to agree to discuss the retrofit of energy efficiency measures in homes in London at its meeting on 8 November 2012.

11. Health and Environment Committee Work Programme (Pages 355 - 358)

Report of the Executive Director of Secretariat

Contact: Carmen Musonda, carmen.musonda@london.gov.uk, 020 7983 4351 and Ian Williamson, ian.williamson@london.gov.uk; 020 7983 6541.

The Committee is recommended to agree its future work programme, as outlined in Sections 4 and 5 of this report.

12. Date of Next Meeting

The next meeting of the Committee is scheduled for 16 October 2012 at 10am in the Chamber.

13. Any Other Business the Chair Considers Urgent

London Assembly

Membership of Functional Bodies and London Borough Councils

Member	Interest
James Cleverly	Chairman of LFEPA
Nicky Gavron	
Jenny Jones	
Stephen Knight	Member, LFEPA; Member, LB Richmond
Kit Malthouse	
Murad Qureshi	
Onkar Sahota	
Fiona Twycross	Member, LFEPA

[Note: LB - London Borough; LFEPA - London Fire and Emergency Planning Authority.]

Recommendations:

- (i) That the list of memberships of functional bodies and London Borough Councils , as set out in the table above, be noted as disclosable pecuniary interests¹;
- (ii) That all Members declare any disclosable pecuniary interests in specific items listed on the agenda and take any necessary action regarding withdrawal following such declaration(s); and
- (iii) That all Members additionally declare any relevant interests (including any interests arising from gifts and hospitality received which are not at the time of the meeting reflected on the Authority's register of gifts and hospitality, and noting also the advice from the GLA's Monitoring Officer set out below) and take any necessary action regarding withdrawal following such declaration(s).

Paragraph 10 of the GLA's new Code of Conduct, which reflects the relevant provisions of the Localism Act 2011, provides that:

- where an Assembly Member has a Disclosable Pecuniary Interest in any matter to be considered or being considered or at
 - (i) a meeting of the Assembly and any of its committees or sub-committees; or
 - (ii) any formal meeting held by the Mayor in connection with the exercise of the Authority's functions
- they must disclose that interest to the meeting (or, if it is a sensitive interest, disclose the fact that they have a sensitive interest to the meeting); and
- must not (i) participate , or participate any further, in any discussion of the matter at the meeting; or (ii) participate in any vote, or further vote, taken on the matter at the meeting

UNLESS

¹ The Monitoring Officer advises that: Paragraph 10 of the Code of Conduct will only preclude a Member from participating in any matter to be considered or being considered at, for example, a meeting of the Assembly, where the Member has a direct Disclosable Pecuniary Interest in that particular matter. The effect of this is that the 'matter to be considered, or being considered' must be about the Member's interest. So, by way of example, if an Assembly Member is also a councillor of London Borough X, that Assembly Member will be precluded from participating in an Assembly meeting where the Assembly is to consider a matter about the Member's role / employment as a councillor of London Borough X; the Member will not be precluded from participating in a meeting where the Assembly is to consider a matter about an activity or decision of London Borough X.

- they have obtained a dispensation from the GLA's Monitoring Officer (in accordance with section 2 of the Procedure for registration and declarations of interests, gifts and hospitality – Appendix 5 to the Code).

Failure to comply with the above requirements, without reasonable excuse, is a criminal offence; as is knowingly or recklessly providing information about your interests that is false or misleading.

In addition, the Monitoring Officer has advised Assembly Members to continue to apply the test that was previously applied to help determine whether a pecuniary / prejudicial interest was arising - namely, that Members rely on a reasonable estimation of whether a member of the public, with knowledge of the relevant facts, could, with justification, regard the matter as so significant that it would be likely to prejudice the Member's judgement of the public interest.

Members should then exercise their judgement as to whether or not, in view of their interests and the interests of others close to them, they should participate in any given discussions and/or decisions business of within and by the GLA.

Members are also required, where considering a matter which relates to or is likely to affect a person from whom they have received a gift or hospitality with an estimated value of at least £25 within the previous three years or from the date of election to the London Assembly, whichever is the later, to disclose the existence and nature of that interest at any meeting of the Authority which they attend at which that business is considered.

The obligation to declare any gift or hospitality at a meeting is discharged, subject to the proviso set out below, by registering gifts and hospitality received on the Authority's on-line database. The on-line database may be viewed here: <http://www.london.gov.uk/gifts-and-hospitality-register>.

If any gift or hospitality received by a Member is not set out on the on-line database at the time of the meeting, and under consideration is a matter which relates to or is likely to affect a person from whom a Member has received a gift or hospitality with an estimated value of at least £25, Members are asked to disclose these at the meeting, either at the declarations of interest agenda item or when the interest becomes apparent.

It is for Members to decide, in light of the particular circumstances, whether their receipt of a gift or hospitality, could, on a reasonable estimation of a member of the public with knowledge of the relevant facts, with justification, be regarded as so significant that it would be likely to prejudice the Member's judgement of the public interest. Where receipt of a gift or hospitality could be so regarded, the Member must exercise their judgement as to whether or not, they should participate in any given discussions and/or decisions business of within and by the GLA.

MINUTES

**Meeting: Health and Environment
Committee**

Date: Tuesday 3 July 2012

Time: 10.00 am

**Place: Committee Room 5, City Hall, The
Queen's Walk, London, SE1 2AA**

Copies of the minutes may be found at: <http://www.london.gov.uk/who-runs-london/the-london-assembly/meetings/whole-assembly>

Present:

Murad Qureshi (Chair)
Jenny Jones (Deputy Chair)
Tony Arbour
James Cleverly
Nicky Gavron
Stephen Knight
Kit Malthouse
Onkar Sahota
Fiona Twycross

1. Apologies for Absence and Chair's Announcements (Item 1)

1.1 An apology was received from Victoria Borwick AM for whom Tony Arbour AM attended as a substitute.

2. Declarations of Interests (Item 2)

2.1 **Resolved:**

- (a) **That the list of memberships of functional bodies and London borough councils, as set out in the table at Item 2, be noted as disclosable pecuniary interests.**

3. Minutes (Item 3)

3.1 The Committee received the minutes of the meeting of the Health and Environment Committee held on 12 June 2012.

3.2 **Resolved:**

That the minutes of the meeting of the Health and Environment Committee held on 12 June 2012 be signed by the Chairman as a correct record.

4. Air Quality (Item 4)

4.1 The Committee received the report of the Executive Director of Secretariat.

4.2 The following guests attended the meeting to answer the Committee's questions on air quality in London:

- Matthew Pencharz, Mayoral Adviser, Environment and Political Affairs;
- Elaine Seagriff, Head of London Wide Policy & Strategy, Transport for London Planning (TFL);
- Samantha Kennedy, TfL Senior Delivery Planning Manager;
- Elliot Treharne, Air Quality Manager, Greater London Authority;
- Dr Gary Fuller, Environment Research Group, King's College London;
- Simon Birkett, Founder, Clean Air in London; and
- Jon Averbs, Port Health and Public Protection Director, City of London Corporation.

4.3 A transcript of the discussion is attached as **Appendix 1**.

4.4 During the course of the discussion, the Committee requested that the following information be made available in writing:

- Confirmation on whether newer taxi cabs are more polluting than older ones;
- An explanation of the rationale behind the Mayor's decision to impose a 15-year cut off point to identify the most polluting taxi cabs as opposed to an annual assessment to determine whether they should remain in operation;
- A copy of the Mayor's written response to the letter jointly submitted by the London boroughs of Camden and Westminster, and the City of London, (dated 15 June), setting out proposals for further action to help improve air quality within London's boundaries; and
- Further information on the projected increase in mode share for walking and cycling by 2015.

4.5 A copy of the jointly submitted letter by the London boroughs of Camden, Westminster and the City of London has been attached to the Minutes as **Appendix 2**.

4.6 During the course of the discussion the Chair tabled a briefing received by King's College London which has been attached as **Appendix 3** to the Minutes and a report by Transport for London which is attached as **Appendix 4**.

4.8 **Resolved:**

That the report and discussion be noted.

5. Responses to Reports (Item 5)

5.1 The Committee received the report of the Executive Director of Secretariat.

5.2 **Resolved:**

That the responses and further information received in relation to reports of the former Health and Public Services Committee be noted.

6. Health and Environment Committee Work Programme (Item 6)

6.1 The Committee received the report of the Executive Director of Secretariat.

6.2 **Resolved:**

(a) That the report updating Members on the status of various items on the Committee's work programme and the main items for the year 2012/13 be noted; and

(b) That it be agreed that officers commence scoping work on a project that reviews the role of Greater London Authority owned land in boosting housing and regeneration which would be a focus of the Committee's work at the end of the calendar year.

7. Date of Next Meeting (Item 7)

7.1 The date of the next meeting was scheduled to be held on 12 September 2012 at 2.30pm in Committee Room 5.

8. Any Other Business the Chair Considers Urgent (Item 8)

8.1 There was no other business that the Chair considered urgent.

**Greater London Authority
Health and Environment Committee
Tuesday 3 July 2012**

9. Close of Meeting

9.1 The meeting ended at 12.29pm.

Chair

Date

Contact Officer: Camelia Thomas, Committee Officer; Telephone: 020 7983 4795; E-mail: camelia.thomas@london.gov.uk; Minicom: 020 7983 4458.

Health and Environment Committee

Transcript: London's Air Quality

Murad Qureshi (Chair): Now we come to our main item of business, air quality in London. I think it is appropriate that we start by having a general overview of the situation and I cannot think of any better authority than someone from King's College, Dr Gary Fuller, to update us on air quality in 2012.

Just to note to some new Members, we have been given a report by King's College, last night, copies of which are available, and Gary will undoubtedly be referring to it when he talks through how he sees the scenario at the moment.

Dr Gary Fuller (Environment Research Group, King's College London): Thank you, Murad, and thank you Assembly Members for inviting me along here today. I produced a brief, I would not say a report, a briefing note, which I believe has been circulated to you, so, with your permission, maybe it is best if I just talk through some of the items there. The briefing note very much refers to concentrations of nitrogen dioxide (NO₂) and PM₁₀ in London in 2011, as measured by the London Air Quality Network, and what I have done through the note is compare these to the National Air Quality Strategy objectives and to the European Union (EU) limit values.

So, in summary, what do we find here? If we look at firstly nitrogen dioxide concentrations, in my figure 1 you can see that the majority of roadside monitoring locations and kerbside locations are exceeding the objectives for NO₂ on an annual mean basis, and in some places, some kerbside locations, and locations in busy street canyons, this can be exceeded by a factor of around two or three. There are a small number of background locations that are also exceeding this annual mean, and they are for the most part in Central London; there are a few areas outside in the suburban areas.

There are also limits attached to, not just the long-term exposure to nitrogen dioxide in terms of an annual mean, but the frequency of short-term peaks that people experience. These are exceeded for the most part in London next to very busy roads and in street canyons, and in my figure 2 you can see the number of monitoring sites that are exceeding those.

Nitrogen dioxide arises in the atmosphere from two sources: partly it is directly emitted from traffic; and partly it is produced in the atmosphere from other nitrogen oxides that are emitted from traffic. So in order to understand how we are progressing with abating nitrogen dioxide, you need to think about nitrogen oxides as a whole. My figure 3 shows some longer-term measurements of nitrogen oxides in London and to kind of simplify this, I have grouped monitoring sites according to their location. For instance, background sites in outer London are the ones with the lowest concentrations at the bottom, and then we progress up through inner

London through roadside sites, and then finally I put Marylebone Road on there as kind of a benchmark; not worst the case for Central London, but amongst the worst cases.

What you can see from this is nitrogen oxide (NO_x) concentrations improved quite a lot up until about the turn of the century and thereafter the improvement has been much slower, and in some cases it has more or less flattened out at roadside locations. A lot of the reasons for this are thought to be associated with diesel vehicles, and there are two factors here.

One is the growth of diesels in the last period. If you look about 2000, I think diesels made up about 14% of the new cars sold, and now they are 52%, I believe, according to the Society of Motor Manufacturers and Traders (SMMT) figures.

What we also find, from experiments that we have done looking at the pollution from individual vehicles on the road as they are actually travelling past, is that diesel cars, most diesel vehicles, but most especially diesel cars, are not exhibiting the reductions in emissions in real-world driving situations that we would have wished for or that were projected from the new technologies. New cars are subject to progressive Euro standards that should be tightening these emissions, but there is a suggestion from these actual real-world measurements that they are not being effective.

The next one looks at nitrogen dioxide concentrations and you can see once again a progression from background sites in outer London through background sites in inner London, and the roadside locations. Here you can also see that trends are largely flat. There are two interesting features here from my perspective: one is Marylebone Road at the top in around 2002-2004, which experienced quite a large increase in nitrogen dioxide concentrations, and this is because of a change in what was coming out of the tailpipes of vehicles. Also, interestingly, and this is something that demands a lot more investigation, is in the last period from about 2011-2012 we seem to be seeing some improvements at some roadside locations and that needs looking at very carefully. A lot of what you see in terms of the line drawn here on these graphs may be in part due to a weighting of the line-drawing algorithm for the weather conditions that we have been experiencing in the last month or two, because, if you look, we have had some very low air pollution concentrations on account of an absence of summer.

Moving on briefly to PM₁₀, if I may, assessment of PM₁₀ is a little more complicated. We have national air quality strategy objectives and we also have EU limit values. In submitting data to the EU for assessment with compliance with the EU limit values, the Government can take allowance of certain factors, for instance particles from natural sources.. So just looking at the pure measured concentrations that we have here at the moment, we need to be mindful that it is not a final representation of London's position as will be reported to the EU.

The United Kingdom (UK) also reports modelling data to the EU, which fills in some of the gaps between the locations where we actually monitor. What I have here is not the final assessment that the UK government will present to the EU since that is a matter for them. But what we do see from the measurements here is that there are a number of monitoring sites that have raw measurements that seem to be exceeding the EU limit value last year As shown here this applies to a small number of roadside sites, background sites, and one industrial site.

If you turn over to the next page, on figure 6 you can see trends for PM₁₀ concentrations since 2004 and these are fairly flat over this period. The Marylebone Road line, since it is just one site, rather than an aggregate measurement across several sites, experiences greatest fluctuations.

So that is a coverage of the main pollutants - the main pollutants that are the focus of the Mayor's air quality strategy - I am happy to take any questions. There are other pollutants that we should not forget, for instance ground-level ozone, that are likely to have health effects on London's population, but they are not a focus for the Mayor's strategies.

One interesting and very encouraging thing we have seen in London. For particles there is some debate as to what is the best way to measure something that relates to the health effects., One of the things that has been put forward is that we should not be focusing just on the mass per unit volume of particles in the air, but we should think about the number. There is the so-called Seaton hypothesis; if you think about the way in which your lungs experience an air pollution challenge, you can have one large particle in one part of your lungs or many tiny particles throughout your lungs and they may have equivalent mass. It is however though that the larger number of tiny particles that might exert a greater health effect. Hence there is an interest not just in the mass, but in the number of particles per unit volume of air

This metric has seen quite a pleasant change in recent times. Towards the end of 2007, the number of particles in the air decreased by about 60% in Marylebone Road and by a lesser amount at North Kensington, but that is just because it is not quite so close to a road. This may be encouraging. It is something that needs to be assessed in terms of its health effects, since previously epidemiologists have found associations between particle number and health effects.

I have produced a brief comment here as well on the low emission zone (LEZ). I am sure you are all aware of low emission zones, so I will not explain the concept. Colleagues from Transport for London (TfL) can probably explain better than me. What we did, as part of an assessment of the low emission zone, was to look at four locations in London next to busy roads. We found that it is difficult to say that there has been improvement in PM₁₀ concentrations, but we are finding interesting evidence in outer London. If you look specifically at the pollutants that come in from the roads, there may have been an improvement in PM_{2.5} and there may have been an improvement in the black carbon concentrations. This is important since different particles come from many different sources, but black carbon is a very good tracer for what is actually coming out of vehicle exhausts. There is an indication that there is an effect from the LEZ on black carbon particles, and this very much falls into line with findings that have been made in other cities, such as Berlin.

The rest of my briefing note talks about some of the wealth of air pollution and health research that is going on here in London, but I will not take the Committee's time explaining those. Also, I think one of the important things, which I wanted to emphasise, comes from the Environmental Audit Committee's report just last year. This is the importance they stressed on public information, and that is an area where we have been working very keenly at King's in order to be able to think about different ways of delivering air quality information to Londoners.

For instance, there is information about smartphone applications and so forth, included in my note.

So, if that is all right, I will stop at that point before my voice fails.

Murad Qureshi (Chair): I thought it was quite humorous with the cough, by the sounds of it. Gary, thank you for that introduction to your paper. Can I apologise to the rest of the expert panel, we only received this actually last night and Assembly Members only received it this morning. I will give you an opportunity to come back. Can I just follow-up some brief questions to Gary. Firstly, I do not quite have in my head what the difference between a kerbside and a roadside monitoring station is; what precisely is the difference? In my mind they are one and the same thing, but tell me otherwise.

Dr Gary Fuller (Environment Research Group, King's College London): We have two types of monitoring site that are really looking at pollution from traffic: we have roadside sites and kerbside sites. Kerbside sites are right close to the kerbside; we are talking within a metre or so of the kerb, whereas roadside sites can extend back 5 metres and beyond. So you have to think about what exposure they are representing; and kerbside sites are really looking very specifically at the traffic; roadside sites might be more representative of, , the building facades than the road.

Murad Qureshi (Chair): OK. Then with particular monitoring stations, you have mentioned the Marylebone Road, is that a fair representation for the rest of the Marylebone Road as well as the Euston Road into King's Cross?

Kit Malthouse (AM): It is just by the Council House, is it not?

Murad Qureshi (Chair): It is in front of University of Westminster, the other side of Madam Tussauds.

Kit Malthouse (AM): I thought it was in the block just by the Council House.

Dr Gary Fuller (Environment Research Group, King's College London): You are correct that, Westminster City Council have been making some measurements at the Council House, which is further down, but this monitoring site is opposite Madam Tussauds, so further east.

Nicky Gavron (AM): Is kerbside low or is it high? Are the monitoring sites at exhaust pipe level or are they high on the buildings?

Dr Gary Fuller (Environment Research Group, King's College London): They are somewhere between the two; generally they are put out of harm's way, so you are looking at sampling somewhere in the region of about 2.5 to 3 metres high, so the inlet is high enough such that someone passing cannot insert a kebab or something like that.

Nicky Gavron (AM): Because I found a great difference on the Ondray Road between ones that were parallel with the exhaust pipes and ones that were at the top of buildings.

Murad Qureshi (Chair): While we have gone into the monitoring stations, just one question to go before I open it up to Kit [Malthouse] and Tony [Arbour] and Jenny [Jones]. We go on to nitrous oxides with Jenny and the EU enforcement, because I think there is particular pressure there at the moment. Just on the PM₁₀ situation, most of your report is based on 2011; where are we on PM₁₀ so far in this year?

Dr Gary Fuller (Environment Research Group, King's College London): A number of monitoring sites have already reached 35 days, which is the EU limit value, although the final assessment is subject to the procedures that are used by the UK and the Department for Environment, Food and Rural Affairs (Defra). I think this has been reached at one industrial monitoring site and one or two roadside locations. Simon [Birkett] watches these very avidly.

Simon Birkett (founder, Clean Air in London): Upper Thames Street and **Neasden** Lane is the full one, yes.

Dr Gary Fuller (Environment Research Group, King's College London): There are a further couple that are actually getting very close.

Kit Malthouse (AM): Just briefly some questions about figure 3 and figure 4, just particularly in relation to the Marylebone Road. I live 500-600 yards south of Marylebone Road. In August 2001, a bus lane was introduced on the Marylebone Road to massive dismay, particularly Terry Wogan (broadcaster). Then of course in April 2003 a congestion charge was introduced and Marylebone Road formed the northern boundary of that zone. Both of those dates coincide on figure 4 with a massive rise in the roads on NO₂, and also then a flattening off of the reduction of NOx. You have us an explanation of a rise in the use of diesel vehicles; it strikes me there is a stronger correlation there around the traffic management and the diversion of more traffic on to that road during that period than whatever it might be. I mean you are talking about going from 90 particles per, whatever it is, on NO₂, right up to about 120, so you are talking about a 30% rise in the space of two years. I do not know if diesel has gone up 30%.

Dr Gary Fuller (Environment Research Group, King's College London): I think you are absolutely spot-on with those observations; they are two things that did occur on Marylebone Road and you are right in the linkages to the time series shown here. In figure 3, the bus lane has not actually been studied that extensively, but it is thought is that it actually had the effect of moving some of the traffic further from the monitor. It is not so much a change in vehicle composition or vehicle flow, it is just the position of the emissions, that changed if that makes any sense. As we can see in figure 3 in NOx concentrations, as they are descending there. There is a certain seasonality in terms of winter and summer, but you can see NOx changing at Marylebone Road from about 2001. So I think you are spot-on with that.

The 2003 change: we did not really find much change that was attributable to congestion charging in its own right, but what we have found is there has been a change in the type of pollutants that have come from diesel vehicles. As I said, nitrogen dioxide comes partially from vehicle exhausts, mostly diesel, and partly it is manufactured slowly in the atmosphere from

other NO_x emissions, again mostly from vehicles. What we found was a really sudden change, and you are right, it is about 30% over a period, I think it is 14 months, due to a change in the proportion of nitrogen dioxide that has been directly emitted from the vehicles on Marylebone Road. There have been various studies that have looked at this and it is thought to be a by-product of many changes to diesel vehicle technology, including some particle traps as well. So that is what accounts for that rather large rise.

Kit Malthouse (AM): But just in general terms I was struck by a coincidence of either a rise on both graphs or a flattening off of reductions, a pretty much one-to-one correlation with the introduction of the congestion charge.

Dr Gary Fuller (Environment Research Group, King's College London): Yes, it is not a congestion charging effect in the direct sense, but it is an effect of the change of diesel vehicles and what is being directly emitted from them, around 2003. I did not head up the assessment of the congestion charging, but the main findings were that congestion charging is affecting a very small part of London. Air of course moves around, if you like, but it [congestion charging] is only affecting a few square kilometres in the centre. Although, from just an observational perspective, it had some really quite large impacts on the traffic volumes, there were many other factors. For instance there was an increase in buses and there was an increase in taxi journeys on the road, although not actually the number of taxis, they could just get about better. Some of these factors balanced out but we did not actually find an overall air quality effect, apart from a change of nitrogen dioxide concentrations, as you can see here very clearly at Marylebone Road, but that happened at other places besides the congestion zone areas.

Kit Malthouse (AM): I just want to ask about that, I mean you may remember that I was responsible, when I was a Westminster Councillor, for challenging the introduction of the congestion charge on the basis that the environmental impact statement was flawed, and yet the health benefits were being sold as part of the congestion charge were false. Your evidence here is saying that is actually true, the health benefits, if any, were non-existent.

Dr Gary Fuller (Environment Research Group, King's College London): The thing is, the changes we see in nitrogen dioxide concentrations are not just within the congestion charging zone, they are in the areas outside, so it is not a congestion charging zone effect.

Kit Malthouse (AM): But the areas outside of the Marylebone Road saw less-massive increases.

Dr Gary Fuller (Environment Research Group, King's College London): There are other sites outside the congestion charging zone that are included in this composite analysis that also saw large increases in NO₂, so it is not a direct congestion charging effect.

Kit Malthouse (AM): Fundamentally, the health benefits that Central London was sold did not transpire.

Dr Gary Fuller (Environment Research Group, King's College London): The health benefits have not been assessed directly, but we have not seen benefits in terms of pollution

concentrations. Although, if you look at the modelled emissions, then you do find that there have been some substantial changes. But, as I say, it is a very small area; central London, and air moves in and out of it, so it is very hard to affect the actual concentrations there, even though what is being emitted from the zone ---

Murad Qureshi (Chair): Before we open that can of worms again, I could also remind people I had a position opposed to that as a Councillor in the City of Westminster at the time when Kit made those suggestions. I would acknowledge, I think there has been an increased volume of traffic on Marylebone Road as congestion charges, but that is later, because you go around --

Kit Malthouse (AM): Yes, we used to get our congestion for free; we have to pay for it now.

Murad Qureshi (Chair): But it is interesting to see, in the report at page 7, there is an acknowledgement that the bus lane introduction did help reduce nitrous oxide. If you look at the --

Kit Malthouse (AM): No, it did not.

Murad Qureshi (Chair): "The sharp reduction in nitrous oxide concentrations." Just look at that, Kit, while Tony Arbour AM comes in.

Tony Arbour (AM): I note there is only one very brief passing mention of Heathrow where you say that there is a high incidence of pollution. I wonder whether it would be your judgment if the introduction of runway alternation and conceivably a third runway would in fact be, from your point of view, an environmental disaster for air quality, not just in West London, but in London as a whole?

Dr Gary Fuller (Environment Research Group, King's College London): There are issues of air pollution around Heathrow, and this has been examined quite extensively by some panels, which the Department for Transport convened, which I was not actually a member of. They highlight very much the nitrogen dioxide issues around Heathrow and the compliance with the annual mean, and all of the modelling work we do in London certainly highlights Heathrow as an issue. I would not like to comment on whether the introduction of a third runway, or even changes to the mixed-mode, would have an effect. I can refer you somewhere else, but I was not a member of those panels to know the detail.

Tony Arbour (AM): Can I test you on that, Dr Fuller, you must have an opinion. Would either of those changes make pollution worse?

Dr Gary Fuller (Environment Research Group, King's College London): As I say, I have not been involved in the assessment so I would prefer not to give something as an opinion without evidence that I am familiar with.

Tony Arbour (AM): That is the sort of answer we give on this side.

Dr Gary Fuller (Environment Research Group, King's College London): Maybe I have a new career as a politician. We know that the aircraft movements at Heathrow are linked to nitrogen dioxides there, and it depends on the way in which a scheme will be implemented. I would assume that anything that would increase those is probably not going to be good for local nitrogen dioxide concentrations.

Murad Qureshi (Chair): Can I just remind Tony, actually the Environment Committee did go into this in March in quite a lot of detail in the Plane Speaking report where we suggested clearly that Heathrow is still expanding, certainly in terms of passenger numbers, if not by aircrafts, and that, if the vehicle movements increase as a result, we really do have an issue with getting anywhere near the NOx targets that we already have with the EU. There is a solution to that; that is increasing the public transport access into Heathrow Airport. There are actually recommendations on the service transport that this Committee made, going into the Transport Committee terrain. So I think in some ways, Tony, we have made that position, and I intend to maintain that position under the Health and Environment Committee.

Jenny Jones (Deputy Chair): Dr Fuller, I just wanted to ask you about some of the measurements, because we have already mentioned the Marylebone Road monitoring station. Clearly it is a huge structure that is measuring the air, at possibly three times the height of an average person, and it must be measuring differently than it would say at breathing level. So, are we getting a slightly lower reading at 3 metres than we would at 1.5 metres?

Dr Gary Fuller (Environment Research Group, King's College London): Yes, it is a very large structure, it is Europe's foremost urban air quality research laboratory, as Murad knows from having been involved in it, having visited it and been involved in its installation. We are very pleased to have nearly doubled its size in the last year or so. It is a perennial issue and I think, Nicky, you raised this before, about what type of exposure we are representing, and there are many practical reasons, for instance --

Nicky Gavron (AM): It is children in buggies I am interested in.

Dr Gary Fuller (Environment Research Group, King's College London): Yes, I agree, and this is where the question often focuses. There are practical reasons from the instrumentation shape and orientation, where you have to measure upwards, and not everything can be measured at ground level. There is a data series I think that has been done by one of the London local authorities that actually has looked at these issues, but it has not been analysed. It is a perennial thing that often arises, but it is not an area where scientists have really invested a great deal of analysis in. Maybe it is an area that we should be focusing on, because it is a very good question.

Jenny Jones (Deputy Chair): So you have not actually done a comparative measurement at the Marylebone site? Because logic suggests it would be less polluting as you go up and air currents start to take effect ---

Kit Malthouse (AM): That is not necessarily true.

Jenny Jones (Deputy Chair): Excuse me, can you keep quiet.

James Cleverly (AM): She is asking you to speculate, Dr Fuller.

Dr Gary Fuller (Environment Research Group, King's College London): As you move away from an air pollution source, the effects of dilution often kick in, so concentrations are lower. But I do not know of any evidence that has examined this question specifically, but it is a very good question.

Jenny Jones (Deputy Chair): Another question on the measurements, we are going to come later in our questions to the measures that the Mayor has taken to lower air pollution, but I just wondered, have you taken any of those measures into account in your report? I am afraid I have not had time to read it yet. So the urban vegetation, the dust suppressants, have you taken any of those into account?

Dr Gary Fuller (Environment Research Group, King's College London): The report very much looks at the measured concentrations and, with the exception of the low emission zone, it does not try to say whether any particular measure has had any direct effect. It is just looking, if you like, very much in the raw sense, at the underlying base information; what is actually out there, because that is what we are really interested in at the end of the day, is the concentrations that we are exposed to in the ambient environment.

Onkar Sahota (AM): Dr Fuller, I am not familiar with this, can you tell me what is the difference between PM_{10} and $PM_{2.5}$? So therefore $PM_{2.5}$ would be more disastrous to health than PM_{10} ?

Dr Gary Fuller (Environment Research Group, King's College London): That is another really good question and a subject of scientific debate. There is a school of thought that says that $PM_{2.5}$ should be the focus of our health concerns, and for instance the Mayor has assessed the health impacts of $PM_{2.5}$. There is another school of thought, a lot headed by my director, Professor Frank Kelly [Professor of Environmental Health, King's College London], that points out that the larger particles, between 2.5 microns and 10 microns, these arise from things like brake wear and so forth, might be really important from a toxicological perspective. We would argue that you need to look at both.

Onkar Sahota (AM): I mean, by the base of the question is that when you look at, say, the delivery of drugs to the lungs, the size of the particle is much more important. So the finer the particle, the more ability it has to get deeper into the lung tissues, and therefore it is much more of a toxic effect, the $PM_{2.5}$ than the PM_{10} would have, because particle size does have effect on the delivery of --

Dr Gary Fuller (Environment Research Group, King's College London): It certainly does, and it does affect where particles deposit in the lungs, exactly your point. You are quite correct. But particles in the atmosphere come from different sources and have different chemical composition. The very small ones are very much more exhaust orientated, whereas there are other particles that are coming from mechanical wear, for instance brake and tyre wear, and so

forth, and these ones are somewhat larger, they are not really found in the 2.5 fraction. So, by looking separately at PM_{2.5} and the larger fraction, we are looking at different chemical composition of the particles that people might be exposed to. But, if all particles were the same in terms of their chemical composition health effects, then your view would be spot-on.

Murad Qureshi (Chair): Before I come back to you, I think we should get some of our expert panel in, because I think it has mostly been Assembly Members. Simon Birkett, a well-known campaigner on this front. Simon, you are going to respond to some points obviously raised, but generally could you say where you think the situation is in 2012 with air quality in London?

Simon Birkett (founder, Clean Air in London): Thank you, Chairman. Perhaps I could just make a point about the health, because I think it is what this is all about. In the great smog of 1952 there were a lot of people dying very shortly, two or three days after the episode, so you could see pollution going up and two days later the number of coffins went up, and the estimate is that something like 4,000 people died from that short-term exposure to visible air pollution very quickly, with more later that year.

At that stage we knew nothing about the health impacts of long-term exposure to air pollution and it was very big cohort studies in the United States, which do not do the time series thing, but actually look at an age group of people over 10 or 20 years. What they identified was the health impact of long-term exposure to PM_{2.5}, the finer particles, which you highlighted, and it turned out that number dwarfed the number from short-term effects. So what we have actually seen over the past 60 years is that of course pollution has come down and the number of people dying from short-term exposure, the great smog type exposures, has gone down, but all of a sudden in the last 10 or 15 years, and in particular with the Mayor publishing his study two years ago, we all of a sudden have this number of 4,300 attributable deaths at an average of 11½ years each, which are through long-term exposure to invisible air pollution. So we have come down but then we have found that there is this new health risk and in 10 or 20 years there may be a completely different one.

But just to finish the point and pick up the PM_{2.5} versus PM₁₀, Gary [Fuller] is very much right about concern about the coarse fraction, the difference between PM_{2.5} and PM₁₀. At an event I was at two or three weeks ago, scientists were highlighting that those coarser particles were probably responsible for short-term effects as opposed to long-term effects.

Onkar Sahota (AM): I am going to point out to establish what these particle numbers we should be concerned about, but also about particle sizes, and I think that is why I just wanted to establish that point.

Murad Qureshi (Chair): Tell me if I am right, experts, but the future European legislation is moving towards the PM_{2.5} rather than PM₁₀. Nicky, do you want to come in now?

Nicky Gavron (AM): I wanted to ask a question, it is just a very simple point, but I understood from what Gary [Fuller] said that perhaps the main cause of concentrations of pollutants is the rise in diesel and the use of diesel as a fuel. It was a very staggering increase in the use of diesel

over this decade, well it is the last decade, we are now in the second decade. I just want to ask you, would you agree with that?

Simon Birkett (founder, Clean Air in London): Yes, I mean diesel is at the heart of this problem. A Parliamentary question confirmed that diesel produces something like 21 times the grams per mile of PM₁₀, the larger particles, compared to petrol; that is for cars. I think there is evidence, which I will be pleased to share with the Committee, which shows that in fact diesel emissions are very much the vast majority of the 80% of PM_{2.5} emissions within Greater London.

Nicky Gavron (AM): Is there any such thing as a clean diesel?

Simon Birkett (founder, Clean Air in London): I do not think so. Possibly the Euro 6 ones, which will come in 2013 and beyond, should have very sharply reduced emissions, but even the Euro 5 diesel vehicles do produce, not just the particles, although they are sharply reduced by the particle filters, but they also produce the harmful gases, the oxides of nitrogen, including the nitrogen dioxide that we have heard. Diesel is really at the heart of this problem and of course you will be well aware that the World Health Organisation has just classified diesel as a class one carcinogen for humans, diesel exhaust to be specific.

Murad Qureshi (Chair): Also, let us not forget the World Health Organisation trigger values are much higher than the European Union; and we are really nowhere near achieving those. Stephen [Knight].

Nicky Gavron (AM): I just wanted to say to Gary [Fuller] that, in the early 1990s we did put air monitoring instruments, machines, whatever they are, at the top of buildings and by the exhaust fumes, definitely on the Archway Road, and I think on Tottenham High Road and Wood Green High Road. So I do not know how far -- it was the early 1990s, and that is where that fact comes from.

Dr Gary Fuller (Environment Research Group, King's College London): . I would be interested to find those data sets if you know of a source, but I know of one data set. At the moment there is experimentation going on in London at height as well and also looking at this issue on Putney High Street by measuring close to the kerbside and then actually at the exposure facade of the building, because there are a lot of people in London who live in flats above shops on very busy roads. You cannot really dismiss roadside concentrations as just being localised; a lot of people actually live in these circumstances.

Just quickly on Simon's potted history of air quality and health.. I totally agree with the evolution of our understanding initially focused very much on episodes, it now focuses on long-term exposure. On diesel, one of the prominent United States (US) epidemiologists, I think it was Arden Pope, came over to the UK about six years ago, and he made the comment that Europe may look back on its experimentation with diesel and really realise it was a bit of a health folly, if you like, it was the wrong thing to do. It may look back and regret its experimentation with diesel.

A lot of the issues with nitrous oxide and with particles seem to point to diesel, and the control of what is coming out of the diesel engines seems to be a lot harder than it is to control petrol engines. So it raises an interesting question with nitrogen dioxide. If you look at a modern Euro 5 petrol car, it emits about a twentieth of the nitrogen oxides of a Euro 5 diesel, so are there solutions here to our problem by thinking about the way in which we are incentivising diesel and petrol vehicles.

Stephen Knight (AM): Because we just referred to the very fine PM_{2.5} particles, I am an avid follower of the alerts that come out from your smartphone apps about particular monitoring stations around London. I noticed about a week ago, or just over a week ago, at the Ikea monitoring station in Brent, I think there was PM_{2.5} readings in the 10 category for a couple of days solid. For those who do not know, the range is from 1 up to 10 with anything above 3 being above the EU health level. 10 is obviously extremely worrying. I just wondered, was there a particular incident at the Brent Ikea last week that you know of?

Dr Gary Fuller (Environment Research Group, King's College London): I am afraid I have been off at home with a chest infection for the last little period, so I am not aware of the exact measurements. But certainly there are some periods earlier on in the year when we saw PM_{2.5} at this 10 level, and it is only recently the Government has introduced PM_{2.5} into its air quality index. Yes, there have been some very high concentrations.

Stephen Knight (AM): It is presumably an extremely high concentration level. I do not know what that corresponds to in terms of --

Dr Gary Fuller (Environment Research Group, King's College London): The Committee on the Medical Effects on Air Pollution looked at a new air quality index for the UK to address, "How do we say to members of the public what these numbers mean?" and they point out at those types of concentrations you could be seeing health effects, not just in vulnerable people in the population, but in the more general population as well.

Stephen Knight (AM): Do you think, at those kind of levels, there ought to be warnings put out to the general population?

Murad Qureshi (Chair): We are coming to that towards the end. We will come to that, Stephen, if you do not mind. While we are on air quality in 2012, could I welcome Matthew, the new environment adviser to the Mayor, and his team, Elliot and Samantha. You have just heard from the experts about what the situation is in air quality at present. You have heard from campaigners like Simon. What is your take from the Mayor's office?

Matthew Pencharz (Mayoral Adviser, Environment and Political Affairs): Thank you for inviting me here. I do not know if it is useful to give out some context of where we are in the Mayor's office and what the Mayor is doing to address air quality. He is delivering a significant package of measures to improve air quality in London. These measures are set out in his air quality strategy that was published two years ago, and some of the work is particularly brave. I know that he received some stick when he was out in the stump in the recent election. So some of the newer, tighter, low emission zone standards for particulate matter required

150,000 vehicles to take action at the beginning of this year. There were new age-limits for taxis and private hire vehicles; that has meant that 2,300 of the old taxis are coming off the road in this year alone. We retrofitted 55,000 homes and 400 public buildings with energy-efficient partition measures, saving tonnes of NOx emissions, and also helping a great deal in reducing London's carbon emissions.

We brought a clean air fund with £5 million from the Department for Transport (DfT), which we are very grateful for, and £5 million from TfL. That brought in innovative measures such as dust suppressants and green infrastructure, taxi marshals, and idling taxis actually do create quite a lot of emissions.

We already have one of the greenest bus fleets in the world. TfL is already retrofitting up to 1,000 of our oldest buses to reduce our NOx emissions by more than 70%. Today, Transport for London is announcing that its 300 hybrid bus is being delivered. So, through negotiation and good financial management, TfL has stretched the £5 million from DfT that was to deliver 70 hybrids actually to deliver 104, and that means that there will be 400 new hybrids by next year and, along with the 600 new buses for London, which are the cleanest greenest buses, that means there will be 1,000 cleaner buses over the next four years.

This means that London has the most ambitious set of measures of any city in Europe. However, the Mayor does accept that more does need to be done to reduce our NOx submissions. It is, after last week we heard that the Commission was not allowing time extensions for other much smaller cities in Europe, so it is not a London problem; this is not even a European problem. Coventry and Liverpool are also busting their NO₂ levels.

I was at a congress with other European regions last week and they are all suffering from the same problems of dieselisation that we have heard earlier. I remember my Italian colleagues were extremely similar I think to this American academic, that our rush to dieselisation with the laudable aim of reducing carbon has the unintended consequences that we should learn from in the future.

While looking at the new term, we looked across a number of policy areas and set out his priorities for the second term. As you are aware, we will be publishing the Mayor's 2020 vision in the autumn, and when he announced this to staff he actually specifically mentioned air quality twice. It is a genuine priority of his and he will be bringing forward measures to get us on a reasonable trajectory to compliance with NO₂ standards.

Jenny Jones (Deputy Chair): Just very quickly. I take your point about Coventry and Liverpool and other smaller cities, but I do not live in Coventry or Liverpool, I live here, so this Committee is actually concerned about London's air pollution! On a very minor point, you talked about taxis, the 12-year rule on taxis. I do not have the pleasure of riding in taxis very often, but I am told that actually taxi drivers are saying that the new cabs are actually more polluting than older cabs and it does seem strange that you have had a sort of artificial cut-off point, if you like, when some old cabs are still very clean. Why did you not decide to do it on whether or not they were polluting and allow them an annual test, because there are some

15-year-old cabs that are actually quite clean; it depends on how well they have been looked after and so on.

Matthew Pencharz (Mayoral Adviser, Environment and Political Affairs): I cannot comment. I will have to get back to you about whether the newer taxis are more polluting than the older taxis. That does seem unlikely to me, but I will look into that. Engines have generally become cleaner, so a 15-year-old engine, no matter how well maintained it is, is not going to be as clean as a much newer engine. It seemed sensible to the Mayor in his last term to have a reasonable cut-off for the older most-polluting taxis and 15 years seemed to him to have the best benefit for Londoners' health, but also not to impose an unreasonable extra cost on taxi drivers. But, if you are driving around in a 16-year-old taxi, which now would not be allowed, a 14½-year-old taxi, is clearly going to be more polluting than one bought just a year ago, no matter how well maintained it is.

Jenny Jones (Deputy Chair): Can you get back to us on the two issues: why it was a 12-year limit and not an annual test, so that if they are clean they could carry on.

Matthew Pencharz (Mayoral Adviser, Environment and Political Affairs): We are continuing the six-monthly tests. The taxis have to do a full test, a Ministry of Transport (MOT), as well.

Jenny Jones (Deputy Chair): Yes, but at 12 years there is a cut-off point now, if you could explain that logic, because some 12-year-old cabs are still clean, and whether or not the new cabs are dirtier. I am only repeating what I am told by cabbies.

Kit Malthouse (AM): Yes, I just wanted to first of all ask you to pass on my thanks, as somebody who lives near the Malvern Road (NW6), because when I look at the NO₂ and draw a line to 2008, there was a massive rise up to May 2008 and then a significant fall following that, so all credit to the Mayor for his actions to reduce it in my area.

Jenny makes an interesting point though, which is she said she is only interested in pollution in London, which is not actually true, is it? We should be interested in pollution in other areas, which presumably is the rationale as to why the European Community are setting the targets in London and the penalties, rather than us just doing it on a national or indeed a city basis. To a certain extent if it does not really matter, or it does matter what we do, but it matters as much what they do elsewhere in the same way that them having a nuclear explosion in Chernobyl mattered in the uplands of Northern England.

Matthew Pencharz (Mayoral Adviser, Environment and Political Affairs): I think all public officials and politicians want the best for our residents. The point I was really making about other cities was to explain, it is not an excuse, but an explanation, that addressing NO₂ is not easy. Much smaller cities than London, we are the biggest city in Europe, has an NO₂ problem, then clearly London has a bigger NO₂ problem because we are that much bigger; the same with our European colleagues. That is the point I was making; I was not saying that because Coventry and Liverpool also have bad air out there, then we should not deal with it. Obviously we should, we need to address the public health of our residents.

When it comes to working with Europe, I mean it is quite important to work with our European colleagues to see what works and what does not work. Some of it is experimental. Dust suppressants is something that we have taken from Scandinavia and Austria, which has worked there, and we are trying it out here. There are some positive early indications but the report will come through in the autumn about that.

Murad Qureshi (Chair): Simon, you wanted to come in on this?

Simon Birkett (founder, Clean Air in London): I think it is important that health standards are universal, they are global; the legal standards, environmental standards for air quality, are set at an EU level to set a level playing field for public health, but also in commercial terms so that, if people operate subject to the same public health and environmental constraints, polluter-pays type constraints.

Elliot Treharne (Air Quality Manager, Greater London Authority): Dr Fuller is much better to comment on this, but I think it is useful context just to follow-up on Kit's point. So far, I think this is correct, in 2012 Air Quality declared eight pollution episodes in total, and over a quarter of the year so far has been declared as being in a pollution episode. This is important context because obviously what ends up happening is that, in addition to any local pollution sources that you might have, the combination with external pollution, trans-boundary pollution, which is well understood, and the EU legislation includes a national emissions ceiling directive precisely for this point, can combine and contribute to exceedances in London. So of course the Mayor needs to be doing everything he can to be reducing those local occurrences, but it is possible, and other cities have these issues too, that the external sources can also contribute to the level of exceedances experienced.

Murad Qureshi (Chair): Elliot, just coming to that point about whether the Mayor is doing enough, if you look at central London, for example, I am aware there is a consensus amongst the City of Westminster Council, Camden Council and the City of London Corporation that actually more quickly could be done. I understand there was a letter sent to the Mayor on 15 June. I am not sure whether you have responded yet. But, for example, they have suggested, all three of those local authorities, that the taxi age, for example, should be reduced from 15 to 10 years; that there should be a review to identify a lower limit than 10 years for private hire vehicles. Are you going to be responding to those suggestions because that is across the board, Labour, Tory and the City of London?

Matthew Pencharz (Mayoral Adviser, Environment and Political Affairs): We will be replying obviously to the letters from the two leaders and the City of London. The Mayor made that decision to a 15-year age for taxis; he did that because he thought it was the best improvement of health without being an unreasonable burden on taxi drivers. We are hoping that, in a relatively short to medium term, the very low emission taxis will be coming to market to fulfil all of TfL's conditions of carriage. But we will be responding to those three authorities.

I would say that those are three authorities that are very engaged in this agenda; there are some that are not so well engaged. The Mayor's office, we are intending to work very closely with

boroughs that are willing to step up to the mark. We believe the Mayor and the GLA and Transport for London is doing as much as we reasonably can, but there are four levels of government here that we need to engage: there is the EU, which I think we will come to later. There are boroughs and there is Central Government and there is us. We are doing our part. We think that there is more boroughs can do and we will be working with City, Westminster and Camden to do that. There is obviously more the Government can do and there is certainly more that you can do.

Murad Qureshi (Chair): I am not seeing, as far as a response from the Mayor's office, because I think, like I said, you have it right across the political spectrum in Central London. We also have an officer from the City of London, John, did you want to just tell us what other kind of measures the three councils were asking for in Central London?

Jon Averbs (Port Health and Public Protection Director, City of London Corporation): Yes, by all means, and thank you again for letting me appear today. Firstly I would say that air quality is a big issue for the City of London Corporation and that is why we have been active in that area to try and bring about improvements. We are not just working with other local authorities, but we have our own air quality strategy, and working with other organisations as well. But there are some common issues between the City of London, Westminster and Camden, and the areas that we focused on were buses, taxis and low emission zones, and doing that.

We have had a very good working relationship with Transport for London and the GLA, we would wish that to continue, and that is why we hosted a meeting in the City of London to get politicians, Members together, and indeed representatives from TfL and GLA to say, "Well, where could we go a little bit further?" As a result of that, the joint letter was put together from the three local authorities and you already alluded to the main things that we are after. Certainly, we do think that we need to look at taxis a little bit more closely. On the buses side of things, we are pleased that the retrofitting is happening, but we would be interested to know exactly what reduction they will bring about. Allegedly it is this high figure, 70% to 80% we have heard, but this is why we are doing some of the real-time monitoring and so on as well, to see exactly what is happening. So, overall, we are pleased with the way things are going, but we do think there is scope for carrying out more work together.

Murad Qureshi (Chair): Well the other interesting thing I noted in the letter was you are also arguing for a fifth phase of the low emission zone. Can you just explain what that is about?

Jon Averbs (Port Health and Public Protection Director, City of London Corporation): Yes. I mean we are interested in what steps are going to be taken to push Government for perhaps an appropriate NOx certification scheme as part of that. We would like to consider what else could be done for PM_{2.5} and black carbon emissions through the low emission zone as well. So we are really asking some questions as to how we could make that work effectively and bring about further improvements via the LEZ.

Murad Qureshi (Chair): I should just inform the meeting, we have Councillor Phil Jones here, a Cabinet Member for Camden for sustainability, and it shows the level of interest that they have in what we say here as well.

Stephen Knight (AM): I wonder if I can just pick Matthew up on a statement he made a little bit earlier, which was that London - in his words - had the greenest bus fleet in the world, and you talked about a number of hybrid buses that are being introduced. Presumably the hybrid buses are still diesel powered, are they? Are they petrol or diesel?

Matthew Pencharz (Mayoral Adviser, Environment and Political Affairs): I will say it is one of the greenest bus routes in the world.

Stephen Knight (AM): One of?

Matthew Pencharz (Mayoral Adviser, Environment and Political Affairs): I mean, we have one of the largest, certainly, and it is also in the very top of the greenest. I am sure there are transit authorities that are very small and have five buses running and they are all marvellous, but on a large scale, we have the greenest.

Stephen Knight (AM): Other than the, I think it is, eight hydrogen buses we have on the road, is the entire fleet powered by diesel?

Elliot Treharne (Air Quality Manager, Greater London Authority): Diesel electric. It is diesel more; if they are hybrid, they would be diesel electric.

Stephen Knight (AM): But the energy source is diesel?

Elliot Treharne (Air Quality Manager, Greater London Authority): Yes, it is diesel electric.

Stephen Knight (AM): So I think we have heard very clearly that the issue is, particularly on NO₂ and also particulates, the source is largely diesel exhaust, and what you are telling us is that apart from the eight hydrogen-powered buses, all the other buses are powered effectively by diesel engines?

Elliot Treharne (Air Quality Manager, Greater London Authority): Just an important bit of context there, this is of course is why the Selective Catalytic Reduction (SCR) of older buses, which have greater overall NOx emissions, is important. The process of this basically reduces the overall level of the emissions of the bus and this is the figure of 70%. This figure is based on testing on a London urban drive cycle at Millbrook on our buses. It is our test; it is not a test in laboratory conditions, which has been part of the problem in terms of assessing the effectiveness of Euro standards more generally. There is also on-bus real time live testing of some of the SCR-fitted buses, and as I understand - I would need to double-check - but I think Putney High Street is going to be one of the locations where the buses will be tested. Furthermore, with Euro VI, we have done some initial analysis of what we expect that to deliver. That is hoped to reduce emissions of NOx compared to a Euro IV diesel bus by 90% to 99%, so

Euro 6 potentially, even though it is a diesel vehicle, has significant potential to reduce overall emissions of NO_x in London. That is part of the reason why one of the things we have been setting out is the importance of accelerating the uptake of Euro 6 vehicles once they become type-approved.

Stephen Knight (AM): What is the total size of the London bus fleet?

Elliot Treharne (Air Quality Manager, Greater London Authority): 8,700 buses.

Stephen Knight (AM): How many of the new Euro 6 buses do you have plans to introduce in the next couple of years?

Elliot Treharne (Air Quality Manager, Greater London Authority): Euro VI is not yet a type-approved standard, so it comes in from the beginning of 2013 and becomes mandatory from the beginning of 2014, so all new vehicles after that point, heavy vehicles, will need to meet the Euro VI standard. So then from that point, in terms of the natural replacement cycle, when we bring in new vehicles, they will either be hybrid or Euro 6 vehicles.

Stephen Knight (AM): What is the oldest bus in the fleet that is still running?

Elliot Treharne (Air Quality Manager, Greater London Authority): The maximum age a bus can reach is up to 14 years, and that is on the basis --

Jenny Jones (Deputy Chair): The Routemasters.

Stephen Knight (AM): We have Routemasters on the road, which --

Elliot Treharne (Air Quality Manager, Greater London Authority): Sorry, with the exception of the historic buses, pardon me, but in terms of the generic bus fleet, it would be up to 14 years on the contract side.

Murad Qureshi (Chair): Thank you. We are going to have to move on to the next area of questioning. Sinmon.

Simon Birkett (Founder, Clean Air in London): Thank you very much for inviting me today. There are two problem pollutants, PM₁₀ and NO₂ and, as the Chairman said, PM_{2.5}, standards for that are coming in shortly. If I just address them separately as briefly as I can, for the PM₁₀ - for both - legal standards have been in legislation since 1999, to be achieved by 2005 for particles and 2010 for nitrogen dioxide. The United Kingdom (UK), which holds the obligation as a member state, although some responsibilities are passed down to the Mayor, obtained a time extension until 2011, which is the latest possible date for the particles, the PM₁₀. However, Clean Air in London lodged a complaint with the European Commission in January saying that that had been obtained unlawfully because the UK had not consulted on the plan that it submitted to Brussels, as it was required to do by the due date, and further, that even if it was obtained, that actually at Neasden Lane the upper limit was still breached. I will come to where we are with that, but that was in respect of PM₁₀.

For nitrogen dioxide, where London has the highest annual mean levels of nitrogen dioxide of any capital city in Europe, that was the latest available date in 2010, and levels comparable with Beijing. Although the particle level is much lower in London, the nitrogen levels in London are comparable with those in Beijing before it took action for the 2008 Olympics. The UK has 43 zones in total for nitrogen dioxide and only 3 of those zones actually complied with the legal standard by the due date of 2010. For the other 40 zones, the UK submitted the plans and programmes to the European Commission in September last year, and it included some wording which Clean Air in London considered misleading, which was to say that the UK is applying for a time extension where these plans and programmes show compliance by the 2015 date, which is the latest possible date for a time extension for nitrogen dioxide. That was included also in the Clean Air in London complaint in January, and the UK clarified to the European Commission in April that in fact for 16 zones, including London, which does not show compliance until 2025, the others, which don't show compliance until 2020, were not included in an application for a time extension.

So the UK only had 24 zones out of 40 therefore going forward for a time extension until 2015. Of those 24, the European Commission last Wednesday published a decision notice saying that it had rejected 12 of those 24 applications. For a further 4, they had a set a date shorter than the 2015 date requested, and for the other 16, for which no time extension was even applied for, those zones are being considered at the moment as the priority for infraction action for breaches of nitrogen dioxide limits since 2010.

Jenny Jones (Deputy Chair): Where does London come in that zonal structure?

Simon Birkett (Founder, Clean Air in London): London is the worst of the 43 zones in the UK. It is not showing compliance until 2025, according to the Government's plans, and these standards have been in legislation since 1999, to be met by 2010.

Jenny Jones (Deputy Chair): Thank you. That is really ...

Murad Qureshi (Chair): Encouraging.

Jenny Jones (Deputy Chair): I am going to come to Matthew for a moment, because these EU negotiations have been going on. I am not sure if you have been able to get out yet or be involved in the negotiations, but I would like to know what the aims, what the GLA and what London's Mayor's aims have been within these negotiations.

Matthew Pencharz (Mayoral Adviser, Environment and Political Affairs): There was a position paper that we presented to the Commission a week ago today, and to summarise what it is asking for, it is that at the moment, there is a whole panoply of different pollutants we are supposed to be measuring and supposed to be addressing. It is our view that this can have tensions, you can pull it in different directions, and it would be a good idea, using World Health Organisation (WHO) guidelines on which are the most polluting articles or gases, to have fewer of them that we have to work against, therefore giving the best improved air quality in addressing human health problems.

The other part is you have heard earlier about the fact that NO₂ emissions seem to have gone on following dieselisation. London suffers a lot from trans-boundary pollution, so Elliot [Treharne] has referred to this earlier, there have been examples of days where even if there had been no car driving or vehicle driving at all, we would still have busted the EU limits because of easterly winds blowing pollution over from Europe. So it is our view that when the EU comes to have a look at how cities are faring, it should be on how much we are actually doing. London and these other big regions really are stepping up to the mark. We are doing what we reasonably can. We have the biggest LEZ; we have imposed these taxi age limits, we are working with local authorities and businesses; we are retrofitting properties; we are really doing a great deal and yet even if we turned everything off in the city, we would still bust some of the NO₂ limits, which reveals that it is not when the EU comes to have a look at it, enforcing the law, there is a bit of natural justice here, that if you are doing as much as you possibly can and you are still breaching the limits, is it reasonable to start very severe legal action against us? That is the question we are posing to the Commission.

Jenny Jones (Deputy Chair): Right. When do you expect an answer on that?

Matthew Pencharz (Mayoral Adviser, Environment and Political Affairs): I don't think the wheels of Europe move terribly fast, so I do not think I can give you an answer on that.

Jenny Jones (Deputy Chair): I would like to hear Simon [Birkett] in a moment, but Gary, you wanted to say something?

Dr Gary Fuller (Environment Research Group, King's College, London): I just wanted to make a comment on the trans-boundary or the imported pollution that Mr Malthouse raised earlier, and Elliot talked to. It is an important issue. It is an important issue for PM and not for NO₂. NO₂, we largely know that is arising within our city area. In regards of the trans-boundary air pollution, you have to then ask a question. "OK, where is this pollution coming from outside [the London area]. Sometimes we get pollution incidents in London for PM that are home-grown; other times we have pollution coming from the outside, and you then have say, "What is this pollution that is coming from the outside? What are these particles?" From the more recent measurements we have been able to make in London, we find that a lot of these are nitrate particles and they are rising in large part from transport air pollution. We had an issue back in March where it appears that the pollution that we emitted into the wider region actually came back to us and contributed to one of the episodes. There is a responsibility here that London and all of the surrounding cities, not just in the UK but Europe has as well, have in terms of the impact we are having on the wider region. I don't think you can really set a boundary and say, "These are London issues. These are issues from the outside". All European cities need to be working together to control this trans-boundary air pollution in the airshed, if you like, that we are all sharing. So that is very important, and for the most part nitrate particles seem to be the issue and a lot of those are coming from transport sources. It brings us back to the same issues again, even though it is a trans-boundary issue.

Jenny Jones (Deputy Chair): No, no, that was exactly what I wanted to ask you about. So it is not necessarily pollution blowing over from Holland or Denmark or whatever, some of it is just air getting washed back in. I am going to come to Simon and then back to Matthew.

Simon Birkett (Founder, Clean Air in London): If I can raise two points quickly. The first is that part of Clean Air in London's real disappointment with the UK plans and programmes submitted last September is they included not one single new committed policy from the whole UK in its submission to the European Commission. In the Mayor's manifesto, although the Mayor did some very good things in his last term, like, for example, the London Plan, which is a really tremendous document, the Mayor actually included not one single new air quality policy in his manifesto. Just in respect of the complaint, the Commission has now closed the complaint, but what they have turned it into is they have put it into a formal EU pilot, which is currently the pre-legislative or the pre-infraction action phase, and if I just read you the things that they are investigating The European Commission [this is a letter I received last Tuesday, which I would be pleased to share with the Committee] has asked UK authorities to provide them with: "

(1) clarification on the process by which the UK obtained its time extension until 2011 to comply with the PM₁₀ daily limit value in London; (2) the exceedances in Neasden Lane, Horn Lane and Upper Thames Street; (3) future monitoring stations the UK will use to communicate compliance; (4) the use of pollution suppressants near monitoring stations [which they have asked for clarification on]; and (5) the situation with regard to air quality plans and programmes for NO₂."

The UK has ten weeks to respond to that request for information.

Jenny Jones (Deputy Chair): That is fascinating, thank you. In your earlier answer, you seemed to suggest that the Mayor is not doing as much as he could be doing. Would that be a fair summary of --

Simon Birkett (Founder, Clean Air in London): The Mayor has not one single new air quality policy, new policy, in his mayoral manifesto, so I am living in great hope that this 2020 Vision document with the Matthew's two references to air quality will really include some really exciting measures, and we will wait and see.

Jenny Jones (Deputy Chair): Thank you. Matthew, you wanted to come in.

Matthew Pencharz (Mayoral Adviser, Environment and Political Affairs): -- the entire document obviously, and the Mayor actually mentioned in his speech to start, he referred specifically to air quality being a priority that he wants to address.

Just something that I didn't mention when it came to our position with Europe, when we were there last week, at the Commission, it was also to explain to them our frustrations with the failure of the Euro 4 and 5 standards that have not delivered the pollution reductions we had anticipated. The Commission, in fairness, does accept this to a degree, but in our view not nearly enough, considering the amount of time and effort and work we have all put into delivering on the 4 and 5 standards. So we are hopeful that Euro 6 will deliver the pollution

saving, the pollution reductions that they have promised, and hopefully they will do the testing properly this time so that it actually is shown to work.

The comment about the airsheds, absolutely, that is exactly what we have all said there. We are within shared airsheds of some of the biggest industrial regions of Europe and the air does go round and round and round, the weather patterns, so we all do have to work together, not just with the UK Government, but with other city and regional authorities and the Commission.

Murad Qureshi (Chair): I look forward to the 2020 Vision, and following air quality in particular, the extent to which the Mayor incorporates the Central London boroughs' perspective and measures on that front.

Can I just mention one last thing on the European enforcement action negotiations? I understand in the Localism Bill there is a clause saying basically that if there are any fines, it is going to be passed on to local authorities. Does that help concentrate the mind or does that hinder progress?

Matthew Pencharz (Mayoral Adviser, Environment and Political Affairs): I would say that it would be extremely unlikely that a bill would come down to the London taxpayer, because there are enough caveats in the Localism Act that if an authority has reasonably shown that it has done enough - or in our case, a great deal - it would not be a reasonable thing to do, for the fine to be devolved down to us. So because the Mayor of London and the GLA and TfL has done a great deal in the last, in fairness, 12 years to address this problem, it wouldn't be reasonable. For the UK to get a fine would take a long time, and then for it to get down to what could take an even longer time. We would have enough to have a very good case in court to show that we have stepped up to the mark and the failure has been realistically not at the GLA level, it has been somewhere else.

Murad Qureshi (Chair): I am very surprised that clause was not dropped altogether actually.

Fiona Twycross (AM): Just as somebody who is quite new to this area, I want to say that I think people are going to look back and be quite shocked that more has not been done on this. The awareness about this issue is still relatively low. It is a question for Elaine Seagriff, really, just about cutting transport pollution, and given the need to further reduce both PM and NO₂, what further measures are being taken generally to cut emissions from transport? So we are looking at quite specific things, really.

Elaine Seagriff (Head of London Wide Policy & Strategy, TfL Planning): TfL obviously has a significant investment programme, and our main focus is to get the public transport network extended, keeping pace with the growth that London is experiencing so that we have an attractive position, people are encouraged to use public transport. So obviously at the moment, we are investing heavily on the transport network through the tube upgrades and Crossrail etc. As part of that, we are also delivering the Mayor's commitments on the push for walking and cycling, to push for much more active travel, to ensure the capture, and we encourage people to have healthier choice options. We have obviously a huge challenge in London in that we are a growing city, we have more and more people living and working here,

but we are very minded to the public health aspect and we are doing more and more work on that just now.

So in terms of getting the transport system much more accessible and available and encouraging people to use it, we are also doing much more of the retrofitting, if you like, that Matthew [Pencharz] has already outlined to clean up the network. We do monitor the usage of the transport system and we do monitor using information from the sources that we have already discussed, London's air quality and exposure and things like that. We are seeing an improved public transport and walking/cycle model here in London, which is unprecedented really for a major city around the world, and our transport strategy, which is complementary to the Mayor's air quality strategy, sets out how we plan to continue that in the future, and that is a key part in our investment decisions moving forward, moving through the business plan.

Fiona Twycross (AM): So what increase for walking and cycling do you expect by 2015, for example?

Elaine Seagriff (Head of London Wide Policy & Strategy, TfL Planning): 2015? I don't have the exact numbers to hand for 2015, but it is basically in line with what we have been working to deliver, but I can follow up with the specifics, but it is basically what was set in the transport strategy.

Samantha Kennedy (Senior Delivery Planning Manager, TfL): I think it is worth saying there has been an 89% increase in cycling over the last ten years and an 8% increase in walking over the last ten years, and in cycling, it was a 6% increase last year.

Elaine Seagriff (Head of London Wide Policy & Strategy, TfL Planning): One year.

Fiona Twycross (AM): So these are very significant increases in those zero emission modes. Can you see any reason why that increase would have happened? Can it be attributed to anything anybody in particular has done? I mean, is there learning that you can take from it to increase it further?

Elaine Seagriff (Head of London Wide Policy & Strategy, TfL Planning): Yes, I mean, we are constantly reviewing. We are doing a lot of work on why people choose whatever mode they choose, why people are opting to cycle or not to cycle, and that work, there is quite an involved piece of research underway. We are doing an awful lot of work around the Olympics and trying to influence people's behaviour for the Games and thinking hard about how we can roll out that good practice more generally across London after the Games. There is some published information on that too if the Committee is interested.

Samantha Kennedy (Senior Delivery Planning Manager, TfL): There has been an ongoing steady increase in investment in cycling and in improvements to urban realm to make walking more attractive.

Elaine Seagriff (Head of London Wide Policy & Strategy, TfL Planning): Yes.

Fiona Twycross (AM): Going back to motor traffic and reducing emissions from motor traffic, do you have any figures for what percentage of London's motor traffic will be electric, hydrogen or hybrid within the next few years?

Samantha Kennedy (Senior Delivery Planning Manager, TfL): I don't have specific numbers. I mean, it is very important to understand that the electric vehicle industry is very embryonic and what we are doing in London is developing an environment which is very attractive for people to own and use electric vehicles, so we have been very successful and are recognised globally as being very successful in doing that, installing public charging infrastructure, providing discounts for electric and hybrid vehicles, providing policy support and providing information support to fleet managers who are running a green fuel fleet programme at the moment. The Energy Saving Trust provides detailed advice to fleet operating managers on how they can better incorporate electric vehicles into their fleets. There is a huge raft of work going on to support that agenda, but this is a tiny, very, very new market and uptake is low and will remain slow in the coming years, not because there is not work to support it and not because people are not keen to embrace electric vehicles, but simply because there is a very low level of global manufacturing capacity, and there are low numbers of these vehicles available. So the investment in the electric and hybrid market now is very much putting London on a long-term trajectory to see bigger increases in these vehicles in the long term. In the short to medium term, the fleet numbers will be low and certainly will not be high enough to have a significant impact on air quality to 2015, because the percentage of the fleet as a whole will be very low, simply because it is an embryonic market.

Fiona Twycross (AM): Yes. I mean, it is an issue that it is going quite slowly really. If it is to move away from diesel, we need to seize on it, so --

Samantha Kennedy (Senior Delivery Planning Manager, TfL): We are doing everything we can to support that shift to the electrification of the fleet, but that is a very long-term ambition, because this is a very new market, and we are seeing increasing numbers of major manufacturers bringing these vehicles to market, but there are very small numbers. They are not mainstream; there is not a second-hand market yet. All of those things need to progress and move forward, and will develop over time.

Murad Qureshi (Chair): Just on Fiona's interest, the Environment Committee last year did some work on electric vehicle take-up, and there is a huge mountain to climb clearly in terms of the take-up of electric vehicles, plug-in points and then the whole infrastructure.

But anyway, Simon wanted to come in here before I come back to Assembly Members.

Simon Birkett (Founder, Clean Air in London): Thank you. Clean Air in London would like to see or encourage this Committee to investigate the Mayor's policy response to this news about diesel exhaust being classified as a class 1 carcinogen in very recent weeks. I would split it into two categories. There are these long-term solutions and the Liberal Democrats have championed the big switch and so on, and of course we need to pursue those, not just for electric, but also biomethane and things, but what we really need is bold policy action now, not two years' time, not three years' time, in parallel as investing in these long-term solutions, bold

action now to reduce sharply the harmful emissions from diesel. The Low Emissions Zone that we have in London, it is the biggest, but actually it is still two steps behind the Low Emission Zone in Berlin, which is much cheaper to run, because here the 1¼ to 3½ tonne vehicles are Euro 3 for particles, not Euro 4 as in Berlin. The London scheme doesn't include diesel cars, and for £10,000 you could fit these filters to buses which reduce the harmful emissions by 60% and 80%. That is what we ought to be doing, retrofitting as many of our buses as we can as quickly as possible, not putting all our money into buying new hybrid buses or something. To get £5 million from the DfT and £5 million from the Mayor to retrofit 1,000 out of these 8,700 buses, that really is not the sort of policy approach or policy response we need. We really need to be retrofitting thousands of these buses in the next two or three years.

Jenny Jones (Deputy Chair): I do feel that technological fixes, they really are important and the thought that Simon has just outlined, for example, the filters, retrofitting the filters, but at some point you have to accept that all the prognostications TfL has made so far have not really, really done the job, which is why we are in the state we are at the moment. There has been 12 years of modelling on this. As soon as the authority was set up, TfL started looking at problems at the Assembly's instigation, and yet a lot of the predictions just haven't happened. For example, as Matthew [Pencharz] said, the European standards did not deliver and taxi filters did not deliver the hoped-for gains and you don't carry out enough testing to make sure that all fixes you are talking about actually deliver the results that we want. It is almost like saying, "This is a really good idea. Let's cross our fingers and hope it works" and so I just feel TfL is not being proactive enough on this and that, I don't know, you are not looking for creative - as Simon said - bold solutions.

Elaine Seagriff (Head of London Wide Policy & Strategy, TfL Planning): Obviously TfL would not agree with that. We feel this is a major area that we are trying to push the boundaries and we are continuously looking for solutions. We obviously have constraints that we work under, but this is an area that does receive considerable attention and we are looking to plan for the future to work to address the PM_{2.5} and NOx as best we can.

Jenny Jones (Deputy Chair): But the looking you have done would have fixed the problem by now, we would actually be living in clean air. If all the TfL prognostications came true, we would have fixed the problem by now, but year after year the modelling just doesn't keep up with reality ---

Elliot Treharne (Air Quality Manager, Greater London Authority): If I just could say, these are broader issues in terms of the fact that Euro standards are not something controlled by Transport for London or the Mayor of London.

Jenny Jones (Deputy Chair): I accept that. No, I have accepted that.

Matthew Pencharz (Mayoral Adviser, Environment and Political Affairs): The same with dieselisation is an issue which is across the whole of Europe you have seen similar issues with other countries as well.

Jenny Jones (Deputy Chair): We accept that as well.

Elliot Treharne (Air Quality Manager, Greater London Authority): This is part of the legacy in terms of the carbon issues. In terms of some of the things that TfL have done, they have actually been incredibly impressive. So, for example, the SCR retrofit which is being done of 1,000 buses, the next biggest city in Europe to try and do that, Barcelona, is doing something like 450, so in terms of scale of ambition, an eighth of the bus fleet with all the hybrids and all the hydrogen and all the Euro VI buses that will be joining the fleet over the coming years, that is a pretty ambitious strategy. Remembering that of course you have to continue delivering value for money for London's taxpayers.

Samantha Kennedy (Senior Delivery Planning Manager, TfL): I just want to come back, just to follow up from Elliot's [Treharne] point about the technological fixes. Just two examples: the SCR retrofit that is going on at the moment on the TfL buses, that has taken extremely close working with the retrofit industry to develop bespoke filters that are designed to work specifically with the London bus engines and their (inaudible) to give the best performance, and that has really required technological breakthroughs that have been really pushed forward by TfL. In the same way for the Low Emissions Zone, before that was launched originally in 2008, we have to work very closely with the abatement industry to ensure that there really would be abatement solutions available for operators who were affected by the Low Emissions Zone universally so that they would have an abatement option. So TfL, accepting that we cannot control the failure of the Euro standards to address NO_x, nevertheless has worked with industry to push forward technological solutions and really drive forward the market and the technology and really push the envelope in this area to deliver this air quality benefit.

Dr Gary Fuller (Environment Research Group, King's College, London): I just wanted to comment briefly. A lot of the modelling work is done by my colleagues and we have been aware for some years of these issues. In my room, where we do a lot of measurements, if we plot the graphs, they are fairly flat. If we go in to the modelling people where they look at the projections for the future, it is all an optimistic world where things go down. By working together and joining these two perspectives, we have managed to highlight some of these issues that we are talking about; the failure of certain technologies, or the current failure, to deliver. There is a lot of work going on in London to actually investigate these things. But there are lessons that need to be learned from this. We set these NO₂ and PM₁₀ Limit Values back in 1999, and here we are in 2012 debating whether we may be achieving them by 2020. I don't think any of us can say it is a good record of achievement. It really isn't. So we need better feedbacks within the system that are actually looking and checking through measurements in the real world, feeding back into these projections to say, "Are we on target?"

The Health Effects Institute in the US has mapped this out from an intervention that you might take to change emissions all the way through to its health end point, and we need to be seeing these in the whole, assessing the impact of a policy and all the way through: did it affect the concentrations? Feedback. Therefore has it affected people's exposure? All the way to affecting health. That is very, very important.

Briefly on the vision for transport I am not an expert here, but a lot of my colleagues who deal with much more public health matters point out the wider benefit of active travel and in terms of exercise, in terms of social cohesion and so forth. So as part of the vision, we need to be considering that, in my humble view, anyway.

Jenny Jones (Deputy Chair): Who is responsible for that feedback? You were saying we need more feedback, understanding when things start to fail and how we can ramp up.

Dr Gary Fuller (Environment Research Group, King's College, London): That is one of the things that makes us the unique organisation that we are. We have actually managed to connect these feedbacks. I have people making measurements and people making projections, but because we are there in the one research institute, we have been able to achieve these feedbacks and point out the issues, which stretch back to the earlier part of the last decade. We have been able to point the conflict between what we think should be happening and what is happening, but this needs to be done much more widely, rather than just within us as an institute. It needs to be accepted in policy ----

Matthew Pencharz (Mayoral Adviser, Environment and Political Affairs): Just linked to that point, it is a very, very short one, it is just in terms of taking forward that feedback, I mean, that is exactly what the Air Group is doing in terms of the European Commission, feeding it back about Euro standards, and likewise the discussion with Government about diesalisation, which we set out these issues as well.

Dr Gary Fuller (Environment Research Group, King's College London): Briefly, if I may, the Mayor's air quality strategy - sorry, Chair - I was just going to say, did actually acknowledge this issue. I think was one of the first public documents that I had seen to actually acknowledge this conflict, between projection and reality. -

Simon Birkett (Founder, Clean Air in London): Two things very quickly. The first is I am sure even at that distance, this is a graph showing reductions on a graph showing oxides of nitrogen from road transport, and even from that distance you can see that in fact the Euro standards and other efforts to reduce NO_x have actually been modestly successful. What has worked against us, there have been two things. The first is the increase in percentage of nitrogen dioxide within the overall NO_x component, which has worked against us, but the overwhelming thing has been this huge shift, Gary described from 14% to 52% towards diesel. So frankly, the Euro standards never included any requirements in respect of nitrogen dioxide. They were NO_x standards. So to say the Euro standards have not delivered NO₂ improvements frankly is ridiculous! What we have is a problem by shifting to diesel.

The second thing I would say - and I think it is very important to have this on the record - Berlin has found that through introducing a 30 km an hour zone, a 20 mile an hour zone, if it is combined with (a) strict enforcement; and (b) traffic smoothing so you don't get stop/start, they have actually found 10% to 15% reductions in nitrogen dioxide concentrations. This is really the sort of thing that London ought to be investigating and acting upon. We need these bold measures now, not just tinkering at the edges.

Nicky Gavron (AM): Earlier I raised the fact that I was very struck by this rise in diesel, and you said, Simon, there was no such thing as clean diesel. Now we hear about what you heard from Matthew [Pencharz] about 90% reductions with the Euro VI standard coming in in buses, and then we hear you saying, “We have to retrofit the buses”. Obviously retrofitting does something. I mean, I remember lying down, 2006, on the pavement in order to get a snap to tell us the handkerchief over an exhaust pipe from the bus to test these filters. I must have been mad, but there was nothing on nitrogen. But since then, we are now hearing that, “Hurray, we are going to have 1,000 buses fitted with these filters” and it is so long ago that I lay on the pavement. So first of all, I want to know, I want you to answer Matthew’s point, about 90% reduction, and I also want to know - and maybe it is in what you have just said, but I am not sure - and then what about these filters? Are they doing something? Because you said there was no such thing as clean diesel. Maybe there is cleaner diesel. I mean, just tell us.

Simon Birkett (Founder, Clean Air in London): The first thing is that I think it was Elliot who said the Euro VI standard is our great hope, but it does not enter into the fleet until 2013, 2014, so that is the first point.

The second is that these big reductions which TfL have found by fitting these, it is not just SCR, it is actually SCRT or it is an SCR, that deals with both the particles as well as the nitrogen dioxide and the NOx. But let’s be clear, this 1,000 buses, I think the programme starts in the summer. We haven’t had these buses retrofitted yet, so that is what we need to do.

Stephen Knight (AM): I just wanted to pick up this issue. I mean, clearly we can and should be doing more in terms of cleaning up the existing fleet now. I just wonder if we can talk about this issue of dieselisation of the general vehicle fleet on the road though, and we have heard about diesel is clearly a source of a lot of this pollution, the proportion of diesel vehicles has gone from 14% to 52% on the roads. Presumably it will go even higher. What can TfL, the Mayor do in terms of concrete measures to discourage diesel vehicles from driving into London, and what are you planning to do to discourage diesel vehicles and to encourage people to shift away from diesel, perhaps to petrol or a petrol hybrid technology?

Dr Gary Fuller (Environment Research Group, King’s College, London): I have a point of information. It relates to cars, not the heavy vehicles where we haven’t seen such a large shift. That is the shift in the car fleet, the new car fleet.

Matthew Pencharz (Mayoral Adviser, Environment and Political Affairs): The drive to dieselisation in terms of the car market has been because of the laudable aim of reducing carbon emissions. Diesel is an all-carbon efficient fuel --

Stephen Knight (AM): I am aware of what has driven it, but what are you going to do to stop it in London, because clearly it is an issue in London which is causing dangerous levels of pollution, so what can we do to --

Matthew Pencharz (Mayoral Adviser, Environment and Political Affairs): The Mayor does not have control of the levers that would slow down or reverse the drive to dieselisation.

Stephen Knight (AM): Could the Mayor not introduce differential charging on the congestion zone between diesel and petrol vehicles, for instance?

Matthew Pencharz (Mayoral Adviser, Environment and Political Affairs): We already have. We already have the agreed vehicle discount [Green Vehicle Discount] and we will be, in due course, coming forward with proposals of - and I think it is in the Mayor's manifesto - of making ultra-low emissions, so that will understandably --

Stephen Knight (AM): Sorry, forgive me if I am wrong, but the so-called Green Vehicle Discount (GVD), isn't that in terms of carbon emissions rather than pollutants?

Matthew Pencharz (Mayoral Adviser, Environment and Political Affairs): I was about to address that point, but emissions, it can be carbon emissions and also pollutants, so that when TfL and the Mayor make a decision about what to go out to consultation by changing the GVD, I will certainly be pushing very hard and I am sure he will be receptive to ensuring that it is not just the carbon emissions, it is also the pollutants as well.

Samantha Kennedy (Senior Delivery Planning Manager, TfL): Can I just add a point of information? The current GVD does set a minimum Euro 5 standard for air pollutants, which is the highest that is available on the market at the present time.

James Cleverly (AM): Matthew, just following on from Councillor Knight's point - actually perhaps, Samantha, you might know this a bit better - I mean, physically large and heavy vehicles are traditionally powered by diesel engines because the torque required to get them going lends itself more to that as a fuel. What would be the implications in total fuel consumption and therefore total emissions if there was what would have to be I suspect at least a European-wide - if not global - move to petrol, going to Stephen's point?

Samantha Kennedy (Senior Delivery Planning Manager, TfL): I have no idea because the technology doesn't exist. There are no petrol engines to move heavy buses.

Stephen Knight (AM): What about cars?

Samantha Kennedy (Senior Delivery Planning Manager, TfL): There are no petrol engines to move heavy lorries, so I am afraid I don't have the information to answer the question.

James Cleverly (AM): OK, so the biggest --

Stephen Knight (AM): What about cars, not lorries?

Murad Qureshi (Chair): Can we stop interrupting?

James Cleverly (AM): So the biggest user group of diesel engines being the large --

Samantha Kennedy (Senior Delivery Planning Manager, TfL): Larger vehicles are 100% diesel fuelled, and the largest individual polluting vehicles, most individual polluting vehicles are indeed the HGVs, buses, coaches, the big guys.

James Cleverly (AM): So in terms of cost/benefit analysis, both in financial cost and burning through political capital, do you think it would be advisable for the Mayor to single-handedly try to eradicate diesel cars?

Matthew Pencharz (Mayoral Adviser, Environment and Political Affairs): The way you put it answers the question by itself. I mean, there are policy levers that we don't hold here which could encourage greener on not just carbon emissions, but other emissions too. The Mayor would be the very last person ever to argue for more taxation for anybody, but certainly when it comes to motorists, but when you come to look at GVD, it seems sensible to us, making sure it is still neutral, that you are encouraging the greenest cars. There has been a tension that has been revealed here of reducing carbon but resulting in an increase in NO₂ emissions. It is not beyond the wit of man to try and square that circle and make it slightly better than it already is, so you don't have the artificial drivers towards diesel that we have at the moment. So without having a total increase in taxes on motorists, there is a way that can be fiddled further to encourage people to drive cleaner, greener cars across the piece, rather than just reducing carbon emissions.

James Cleverly (AM): Comparing that discussion that we have just had with a move towards primarily electric cars for the private ownership fleet and diesel electric for the heavy movers, do you not feel that perhaps having a row between private diesel vehicles, private petrol vehicles is actually last century's rows and the row that we should be having is how do we (inaudible) the pace of the electrification of the vehicle fleet, either completely for private vehicles or diesel electric hybrids for the heavy movers?

Matthew Pencharz (Mayoral Adviser, Environment and Political Affairs): It is clear that we should be moving towards the cleanest vehicles there are, and that is hybrid, that is electric, that is potentially hydrogen. There are a variety of technologies here and the Mayor has done a lot of investment in all of them. The Hydrogen Partnership has had some real success and there is potential with some pretty major vehicle manufacturers going to market with properly mass-produced hydrogen-driven vehicles, private cars. He has done a lot, and my colleagues here have spoken about the Source London electric vehicle (EV) infrastructures now in place and priming the market. In due course the market will deliver mass-produced electric vehicles at a more realistic price. So the Mayor is delivering and is pulling the levers he can pull, but other people have to step up to the plate. I mentioned central Government and the boroughs and the Commission in this session.

Simon Birkett (Founder, Clean Air in London): I would just say, James, is that we certainly need to be putting a lot of effort and the investment into the long-term solutions. There is no question that is right, but the problem is that they are long-term solutions. We have 1,000 schools near the busiest roads, you have diesel taxis, buses running around every day. The cheapest way to deal with the health issues - never mind the legal issues but the health issues -

is actually to get this SCRT, a sort of combined SCR and particle trap, fitted as quickly as possible to thousands of buses and to come up with some solutions for the taxi fleet.

Murad Qureshi (Chair): We will move on now to the next section, which is going to be led by Tony. But just before I do that, I just checked up on the Health, Safety and Environment Report that TfL did last year. On emissions, it did say quite clearly that CO₂ emissions are up for a third successive year and NO_x and PM₁₀ missed the targets for a second consecutive year. So, whatever is happening, if you look at the measures within the TfL reports, we seem to be missing them throughout the GLA group. I just thought it was worth parking that there and moving on to Tony, who will lead on the non-transport emissions.

Tony Arbour (AM): Yes, exactly right, and I suppose this must be one for Matthew. What plans do you have for introducing non-polluting sources of energy? Are you up for wind, sun or possibly nuclear?

Matthew Pencharz (Mayoral Adviser, Environment and Political Affairs): We have a great deal of policies to reduce both pollutants that we are discussing here but also carbon emissions, so our retrofit programme that I mentioned earlier has already delivered to 50,000 homes energy efficient measures through RE:NEW. We are obviously working closely with the Government to make sure the Green Deal delivers as much as it possibly can in London. London is the most difficult place because we have the oldest housing stock and we are obviously very built-up, but we will make sure that we get our fair share or more than our fair share to deliver the retrofit of private homes. The RE:FIT scheme, which is the refitting of public sector buildings, now it is up and running, is very special indeed. People can see that you get your payback within seven years, so big institutions can see it is a no brainer and are rapidly refitting their buildings. We have 400 in the pipeline in London alone.

We are also looking at decentralised energy, which means that when you build a big development - say you knock down Elephant and Castle and you want to rebuild it - instead of just plugging into the mains, you have onsite a very clean, green generator or a combined heat and power (CHP) plant, which instead of channelling the electricity from a power station hundreds of miles away and losing half of it in the wires is actually onsite. That reduces the carbon a lot and, when their buildings are all to the top of the building standards, they are what we call air-quality neutral. So, for big developments like this, the idea is that what they are replacing will have at least neutral and hopefully better air quality than what was there before, which is quite innovative. We think we are the only authority to impose this on big plans.

We should say that a quick win when it comes to building retrofit on the Green Deal is the energy company obligation (ECO). I said earlier that there is a danger with London because we are quite a difficult place to retrofit, so we really need to have targets to address our buildings here in London.

Tony Arbour (AM): Are you going to make the 25% target by 2025?

Matthew Pencharz (Mayoral Adviser, Environment and Political Affairs): In order to deliver the Mayor's carbon reduction target, our report showed that we would need £40 billion

worth of investment. Clearly, the economy is not improving very quickly. It is quite clear that not all that money is going to come from the public sector or from grants or from the precept or wherever else. That is why it is quite important to show that private sector institutional investment is a good deal. It is quite interesting to show that the economy is pretty flat in London but the environmental industry has shown a more than 4% growth over the last few years and is projected to grow by a further 4-5% over the next few years coming up. Considering how grim everything else is looking, that is pretty positive, so it seems like a logical place where big institutions should invest. We have shown how RE:FIT works very quickly. You can get your money back in seven years.

This is what I see as part of my job and when I was in Rio de Janeiro a fortnight ago it was to go out and talk to the big companies who are interested in investing in smarter cities and all the rest of it, to raise that money, to invest in the programmes that we know we want to do. We just need to get the money to do them, so we are hopeful.

Tony Arbour (AM): Do you really think that seven years is a rapid payback?

Matthew Pencharz (Mayoral Adviser, Environment and Political Affairs): Yes, I do.

Tony Arbour (AM): You do?

Matthew Pencharz (Mayoral Adviser, Environment and Political Affairs): Yes, I do. It is a very good payback.

Tony Arbour (AM): I do not think the Lord Sugar would agree with you, but there we are. Thank you, Chair.

Dr Gary Fuller (Environment Research Group, King's College London): I just wanted to raise an issue if we are talking about the non-transport sector. Something that does concern us here in London, and many other cities, is the increased solid fuel use that seems to be out there; there is quite an increasing popular trend towards wood-burning, for instance. You may know from your own neighbours, for instance. With London's history of air pollution, we should remember the difficulties of burning solid fuels from times in the 1950s that Simon has talked about. So I raise it as an important issue. We need to be careful about the amount of solid fuel burning that is returning; people with their own fireplaces, which is old technology, and we also need to be careful about the new types of wood-burner that are being introduced out there. Colleagues in the City of London Corporation have done a great deal of work in this area.. It is something that has been highlighted in recent studies in Paris and Berlin as well. It is something of concern.

Simon Birkett (founder, Clean Air in London): I think that covers it, yes.

Tony Arbour (AM): It is a genuine Aga saga, is it not?

Murad Qureshi (Chair): Yes, I am sure that you have one up there. OK, we have dealt with non-transport emissions. We are moving on to the next area, which is going to be led by James, cleaning the air.

James Cleverly (AM): I am conscious of your time, Matthew, so I will kick off with you and then perhaps broaden this out a little bit. I know you have touched upon it in various other bits but just so that we have a starting point for this bit of the discussion, could you just run through some of the current projects and future plans to actually help remove particulates in particular and other pollutants from the air?

Matthew Pencharz (Mayoral Adviser, Environment and Political Affairs): I laid out earlier the current projects that TfL and the Mayor are doing. Taxis are quite a big emitter of particulate matter, so the 15-year taxi rule will deliver quite a lot of savings there. The introduction of the LEZ phase three has taken off the roads or caused to be retrofitted a great deal of minibuses and large goods vehicles (LGVs) which were high pollutants. On dust suppressants, we are trying out some innovative technologies such as that on the main arterial routes through London, so Upper Thames Street, which obviously affects the Corporation, or Marylebone Road and the Blackwall tunnel corridor. We should be getting a report coming through in the autumn about that.

Going forward, the work that is going into the 2020 vision document will play a large part on how to make London a cleaner, greener city. This fits very well into the jobs and growth agenda which is how the Mayor was re-elected. When we are promoting London to investors to come and move their big corporate HQ, where do they want to go? Do they want to go to Frankfurt or do they want to go to London? There are lots of different things they are going to decide on. Do we have the right demographic? Do we speak the right language? Are we in the right place? But an important one is to do with the quality of life that a city offers. Having cleaner, greener air that is clearly getting cleaner is going to make it more likely for that big corporation to decide to place its HQ here rather than anywhere else.

James Cleverly (AM): In terms of the proposals that you have in place, Simon made the point that there is a range of new proposals that was being put forward in the 2012 manifesto. Is that a fair comment? If it is a fair comment, what are the reasons behind that?

Matthew Pencharz (Mayoral Adviser, Environment and Political Affairs): The Mayor has shown real commitment to air quality in his last term. He implemented measures that were quite politically brave. You were out on the stump in your patch and you would have heard some pretty irate van drivers and taxi drivers, I am sure. But he decided, rightly, that air quality is an important thing to improve the health and wellbeing of Londoners, so he did that, despite the fact that some of these people were worrying about the extra costs they had to incur by replacing their vehicle or having it retrofitted.

There are a few measures in his manifesto specifically about electric vehicles. He wants to increase those and has made a promise of 1,000 in the GLA fleet. He will also work with the London Health Improvement Board (LHIB) to work with air quality improvements across the city.

What I would say is that you cannot measure a person's commitment to a project by how many words there are in a manifesto. There are a lot of things going forward already. We are coming forward with measures further to improve London's air quality to make sure we are on a reasonable trajectory to compliance with EU limits. What I would say is hold this space because they will be coming along relatively soon.

James Cleverly (AM): Kit made the point and it is an interesting one. He stole my thunder somewhat, but seeing as he has gone I am going to try and reclaim a little bit! On page 9 of the King's College report is the combined locations graph for NO₂ with a very noticeable upturn from 2002 to 2008 followed by a very noticeable (overspeaking) 2008 to 2012. Are you saying that the Mayor is comfortable and committed to the programmes that he has put forward? Simon has mentioned about the rollout of retrofitted particle filters for the bus fleet and investigations into an equivalent for the taxi fleet. Are there still going to be ways that ideas like that can plug in as interim measures until what we have discussed as potential big wins - such as the mass electrification of the vehicle fleet - get here?

Matthew Pencharz (Mayoral Adviser, Environment and Political Affairs): Air quality is an issue where it is not just transport. There are lots of different things you can do. As Tesco says, every little bit helps in this area. So neither TfL nor the Mayor would accept the criticism that we are not doing enough. We are retrofitting and replacing the bus fleet as quick as is reasonable without bearing too much of a cost on the London taxi and bus fares. Putney High Street is a good example. Maybe I have to give you exact detail. Just a year ago, they were running old, pretty high polluting buses on that road. But within a year we have 80% retrofitted and hybrids. Is that right?

Elliot Treharne (Air Quality Manager, Greater London Authority): So, yes, and also we will be introducing higher Euro standards, so Euro VI buses as well. The proportion of buses on Putney High Street meeting the Euro IV standard or above is going to go from 20% to 80%

Matthew Pencharz (Mayoral Adviser, Environment and Political Affairs): Within a year. How fast could TfL reasonably deliver a complete change of a bus fleet down one road that is particularly bad as Putney High Street? That is because of the geography and the canyon effect. Putney Bridge is a very busy crossing of the Thames.

But there are lots of other measures that we are also involved in. I mentioned earlier about the Clean Air Fund and that is also trying to do some behavioural change. We need to stop people idling. I am genuinely mystified why anybody would ever idle because of how much fuel costs. But some people do. They need to keep their air conditioning on or whatever. Taxi marshals are using schools to educate their parents not to idle outside when picking up their kids. That is quite a receptive audience because of children's health and air quality. There is also work to do with - and this is controversial in another way - smoothing the traffic flow so you do not have the stops and starts. A lot of the emissions are caused by stopping and starting traffic. If you reduce that by re-phasing the traffic lights so there is not so much stopping and starting of heavy vehicles, you will reduce the emissions. Then the boroughs have to work on streets that are not controlled by the Mayor and work with their businesses so, if they are working with

clapped-out boilers pumping out NO₂, they need to change that and working with businesses and engaging with them to say, “You can replace your boiler perhaps on a quicker timeframe than originally anticipated. They are much more efficient and you save lots of money through your bill. Also, you are pumping out fewer pollutants”.

So there are lots and lots of different things that different levels of government have to do in order to address this problem. It is not just transport. It is the buildings as well and our behaviour.

Jon Averbs (Port Health and Public Protection Director, City of London Corporation):

Just picking up on something Matthew said in relation to the LHIB, we would certainly encourage the Mayor through that organisation to look at air quality. It does seem to fit within the criteria for the different subjects that it can take into account.

I should also mention that local authorities are taking on responsibilities for public health and will be having their own directors of public health from next year. There are of course health and wellbeing boards for local authorities as well and they are also starting to look at air quality and doing the strategic needs analyses of all their health issues. Certainly in the City we have come up with air quality as being one of the 13 priorities for us, so going forward to take on the point about information, these are the sorts of things we can be doing and we do need to be engaging with business. What we found in the City was that although businesses were not really aware of air quality problems, when we did go and talk to them they were very supportive and actually going forward, supporting us, getting campaigns going, looking at their delivery mechanisms and encouraging their staff to walk and cycle. This is something we all need to work together on to do that.

Gary made the point in his report and mentioned the House of Commons Environmental Audit Committee’s report last year which stated, “A public awareness campaign would be the single most important tool in improving air quality”, so that is another area that we do need to take on board. It is not just about transport.

Murad Qureshi (Chair): Jon, we are going to be coming to the health board specifically and undoubtedly will be pushing air quality there as well. Jenny.

Jenny Jones (Deputy Chair): I just could not let Matthew’s remark about smoothing traffic flow go because it is not the same as what Simon was talking about earlier, which is what a lot of other more enlightened capital cities do, which is to re-phase your traffic lights so that if they are keeping to a certain speed, say 20 miles an hour, vehicles can actually go through 13, 14 or 20 traffic lights without slowing down or speeding up. That is not what is happening here in London. What is happening here in London is crossings have been taken out, pedestrian times have been shortened and it is a completely different kind of operation. So it is a misnomer to call it smoothing traffic flow and it is very important that we do not confuse what Simon was talking about with what the Mayor is doing now.

Murad Qureshi (Chair): OK, we will just take that as Jenny’s views.

Jenny Jones (Deputy Chair): No, I am sorry. There is something there to --

James Cleverly (AM): OK. If that is on the cards, I have views.

Murad Qureshi (Chair): I was going to come back to the question, actually, if you do not mind, and move on to the next area before we go well over time.

The short-term measures which TfL have put in place like the green wall on the side of Edgware Road Tube Station, on the side of Edgware Road Tube station, a lot more of that, substantially more. We have put that in the right place near the Marylebone Flyover, but I suspect you would need a whole forest there to really absorb all the emissions there. Dust suppressants, though clearly the jury is out there and without going into the wherefores on that, there is clearly opinion which would suggest that that is not actually dealing with the issue but just dealing with it at particular points where the monitoring stations are.

On the idling of engines, one particular thing I had picked up on the Marylebone Road, particularly with Marylebone Station, Euston and King's Cross, is the enforcement of the particular taxes. I think a lot of local authorities can tell you quite a bit about enforcement. It is more difficult to apply policies than come up with policies and that is one instance. But that is what I have picked up locally in central London.

Can we now move on to the next area, avoiding exposure, which Stephen will be leading on?

Stephen Knight (AM): I wonder if I can ask maybe Gary or Simon to comment on the issue about what the public systems that we have at the moment that rate air pollution from one to ten really mean and what the public ought to do about it. My understanding is that one to three is categorised as low and within EU limits. Above that, it goes through moderate, high and very high. Presumably, at different levels the health effect on individuals varies and presumably one ought to take some avoiding action if the pollution gets to certain levels. Do you want to comment on that to start with?

Simon Birkett (founder, Clean Air in London): Then I will follow up.

Dr Gary Fuller (Environment Research Group, King's College London): Yes, the new air quality index which was launched in January contains these features. You are quite correct.

It also contains, which is an important part, much better health advice than we used to give people about air pollution; asking people to think whether they are in vulnerable categories or the general population. But, yes, you are quite right. Most of the advice that is really is about exposure and it is not about, for instance, taking it forward into a London context, thinking about how we might travel around the city. Should you be travelling through a park during a NO₂ incident because you will have less exposure or should you be travelling close to roads? I think there is a lot to be done to help people think about their exposure.

We also have to think about encouraging people who are on the other end; those responsible for the emissions. It is not just a question of asking people who are affected to modify their behaviour. We have to look at the other side as well. I will pass to Simon.

Simon Birkett (founder, Clean Air in London): I am very glad you asked. First of all, the monitoring of air pollution is the absolute bedrock of absolutely everything we do and the monitoring network is under threat at the moment.

But if we just park that issue for the moment, this new air quality index is really fabulous. It is not used uniformly by all the channels which warn people and publish information and that is an issue. It has been highlighted specifically by the Commission for a Sustainable London 2012 as one of nine key issues that still need to be resolved before the Olympic Games which is in particular, they said, how visitors to London for the 2012 Games would be warned about pollution levels if we have some sort of episode.

Talking very specifically, the Mayor and the Government both say they want to tell people about the dangers of air pollution but Clean Air in London has urged the Mayor and the Government to issue proper smog alerts, not just having something passively on a website or occasionally tweeted, with positive press releases. The Mayor says it is for the Government to issue press releases. The Government says that they will only issue one if it is going to be ozone-high and on their monitoring network. So, when it is going to be any of the other pollutants, like we had ten out of ten for the PM_{2.5} particles in mid-March, there was no announcement and no press release from anyone. When the Government put out their press release in April last year with that smog episode, a Freedom of Information Act request showed that there were 9,100 hits on that webpage over 30 days. When they put out the information bulletin, which is what they put out this year after the Telegraph, frankly, had ridiculed the Government's approach on this subject, that information bulletin had something like 500 hits and guess what? It was picked up by no one other than the Telegraph who then said, "At least we have something".

So this is a massive issue. Why for heaven's sake are we not out there warning people when, at a ten out of ten level, the advice even for the general population is to reduce your exertion, particularly if you feel symptoms. So this is a massive issue and it is very poor that this has not been addressed in the run-up to the 2012 Olympic Games.

Stephen Knight (AM): If we were to get an episode like the episode we had in March in a few weeks' time during the Olympics, say during the marathon event, presumably that could have an impact on the athletes as well, could it?

Simon Birkett (founder, Clean Air in London): The specific concern for the summer is really about ozone. There was a very good article in the Independent. What the top lung biologist said in January is that in a 2003/2006-type smog episode, which are these really intense smog episodes, actually the endurance athletes like marathon runners or long-distance cyclists, could experience tightness in their chests and their performance could be affected. If they are asthmatic, they need to take medication. That is something we do need to take very seriously.

Stephen Knight (AM): Thank you. We do not have Matthew here but I wonder if Elliot could --

Elliot Treharne (Air Quality Manager, Greater London Authority): I would quite like to address some of those points because obviously a lot of work has been taking place between Defra, the Health Protection Agency (HPA), the London Organising Committee of the Olympic and Paralympic Games (LOCOG) and King's providing support as well and obviously the Mayor's Office in terms of making sure that there is key information available about air quality during the Olympics and that this is disseminated to visitors as required.

The most important development is that the airTEXT Consortium has developed a new app which will include health bulletins covering UV, air pollution, pollen and temperature. These will be made available at the Live Sites and also on their website and through the app. The app and airTEXT is being promoted in the Olympic boroughs and 150,000 business cards are being printed with the airTEXT information. These are being given to the London Ambassadors and also to hotels, so they will be disseminated to those visiting London who might not be aware of this service. So a lot of activity has taken place in terms of making sure that that kind of important information is available.

Dr Gary Fuller (Environment Research Group, King's College London): I just wanted to respond on one point or two, really. There is quite an appetite for the public to receive information. We launched some smartphone apps of which I think, Stephen, you said you were a user earlier on. We were really pleased with the uptake of this on a zero publicity budget, really. There was a pollution incident in Easter 2011 and we were able to send out 400,000 notifications to smartphone users telling them about local concentrations in their area. This was a very important step forward.

Stephen Knight (AM): Right now, it is saying Putney High Street is above the NO₂ limit, so on that information do not go to Putney High Street right now.

Dr Gary Fuller (Environment Research Group, King's College London): On the Olympics, Elliot is quite correct. The HPA has been convening a working group that draws together many experts in the field and many of the stakeholders to provide information can be fed in to the Olympic Games organisers.

Simon is quite right to highlight the issues to do with ground level ozone and athletic performance, but it is very hard for a city like London to actually manage this pollutant. One of the best things that can be done is to think about the scheduling of the endurance events. Ozone always peaks in the afternoon with the highest temperatures and the strongest sunlight. Many of the endurance events are scheduled towards the morning-time. Maybe it is television schedules. I do not know. But the effect is to reduce many of the athletes' exposure to air pollution, That is probably the best thing we can do there.

Murad Qureshi (Chair): That is useful. I would just note Simon's suggestion that we may lose the monitoring network. That is obviously of concern. You are right to say the ozone is an

issue. It is actually the specific issue that the International Olympic Committee (IOC) is interested in. It was interesting in Beijing. Whilst they took considerable measures to deal with air pollution, it did not seem to affect the athletes because we had a record number of Olympics and world records broken in Beijing.

Just one idea I always had: I am surprised that in the monitoring stations we do not have electronic monitors of some sort to indicate whether on the Marylebone Road it is a good or a bad day. Yes, you can use information technology to a lot of people, but those going past need to be picking up the message as much as anyone else. That seems to be the approach in China, the Far East and the rest of East Asia.

Simon Birkett (founder, Clean Air in London): If I can just respond on that specific point, I would like to see these business cards sent out to Londoners as well as visitors. But just to pick up on your precise point, Camden, which is really leading London in this respect, has put a liquid crystal display (LCD) monitor up on the wall of their town hall in Euston Road, which actually can give people updates on pollution. I think there is something essential about that, though in my understanding it is not happening yet, which is that it should say not that it is low or something but, if it is moderate like these levels that Stephen has been talking about or if it is high, it should specifically say on that screen that it is moderate, high or very high today. Otherwise, my understanding is it is going to use the word “elevated”. But what does elevated mean? So I think this is something which we really do need to crack quickly.

Murad Qureshi (Chair): Simon, I had not noticed that but next time I am down on the Euston Road I will look out for the LCD that Camden Council has put up. Gary?

Dr Gary Fuller (Environment Research Group, King’s College London): I just wanted to say on smartphone technology that I respect Murad’s suggestion about putting notices on monitoring sites, but we have only a few discrete monitoring sites. On smartphones particularly, we are launching something in the coming week that will actually allow people to display real-time maps of air pollution for NO₂ and PM₁₀ on smartphones. Many people are using smartphones of course to navigate their way about the city, so it could be a really useful step forward to bring together these two bits of information, air pollution information and then also information about how people are travelling around. With the rise in smartphone use, it offers a good opportunity to engage the public.

Stephen Knight (AM): I wonder if I could ask you finally just to comment. There seems to be two different types of information available. There is airTEXT system which refers to wide-ranging pollution across big areas and then there is the monitoring station information which comes out on a different system and says, “At such-and-such a high street, it has been measured at this level or that level”. It seems to me that on the individual site locations we get quite a lot of high pollution level measurements, particularly at places like Putney High Street, Neasden Lane and the various hot spots we know about. But quite often on the airTEXT you get nothing because it just gives you a generalised prediction for the whole borough or area. I noticed at the moment you are measuring moderate levels of NO₂ on Putney High Street but the airTEXT system says, “No pollution for Wandsworth”.

Elliot Treharne (Air Quality Manager, Greater London Authority): You are quite right. At the minute it is on a borough-wide basis. One of the things that the Mayor has actually provided funding to airTEXT to do is to disaggregate that to a more meaningful localised basis. However, you are also quite correct that you need both sets of information. You need to know if there is any specific problem locations but also---

Stephen Knight (AM): I need to know whether I can go to a particular place. If I know that the IKEA branch on the North Circular Road has ten for particulate pollution this weekend, I might choose not to go shopping there. Those kinds of warning are not given at the moment, except if you happen to get the individual pollution monitoring data direct via the app from ---

Simon Birkett (founder, Clean Air in London): If I can just come in, we need to be clear. There is a monitoring network and there is an information or an understanding network. The monitoring network that King's run is the most fabulous thing. It is easier for me to say that than Gary. It is the most fabulous network. It is under threat because some boroughs are dropping off the reporting of their data into that sort of central system. We have airTEXT as one of the communication providers and King's as one of the others, so we need to separate out the two issues.

Murad Qureshi (Chair): Just one very last point in this area and then we will move on to Onkar.

Elliot Treharne (Air Quality Manager, Greater London Authority): I was just going to say I actually echo exactly what Gary and Simon have said on that. Matthew in particular has been having a number of conversations at the political level with boroughs about making sure that we do keep that central repository of information and ongoing issues about the funding of monitoring stations, so that is very much on Matthew's radar.

Murad Qureshi (Chair): There is plenty of agreement on avoiding exposure. Onkar, can we move on to public health?

Onkar Sahota (AM): Yes. Jon, this is the area you were reflecting on. Public health (inaudible) with the local authorities and I was wondering what sort of emphasis had been given to air quality and what are the barriers for public health to pursue these goals.

Jon Averbs (Port Health and Public Protection Director, City of London Corporation): First of all, we are dependent on each local authority to carry out its strategic needs analysis. They will do that and determine what they consider in each individual area are the priorities for them in relation to public health. As I said, in the City we have already done that and have included air quality as one of our priorities, but that is not to say that that will be London-wide. Certainly you can imagine that in some of the outer London boroughs it will not be so much of an issue but I imagine that for the inner London boroughs, bearing in mind the collaboration that is already going on, that it will be something which they take on board.

In terms of the barriers, we are still waiting on the funding side of things, really, and that is going to be a key part of it, but it will be for the other competing priorities as well. Depending

again on individual boroughs and what they perceive as the importance of air quality for their residents, there needs to be consultation and the compiling of the strategy for each borough, so if residents consider that air quality is an issue they will have the opportunity to contribute towards that, so it is going to be about competing priorities, I think.

Onkar Sahota (AM): What about a whole-London approach? Is anybody doing that?

Jon Averbs (Port Health and Public Protection Director, City of London Corporation):

This is where there is the potential for London to be led by the Mayor with the LHIB. That is where perhaps we can get some collaboration. They could possibly collaborate with the boroughs to make sure that boroughs are taking this on board. So, as I said earlier, that is where I would encourage the Mayor to get the LHIB to take that into account in establishing priorities because we do need that overall London approach for all the reasons we have talked about today.

Elliot Treharne (Air Quality Manager, Greater London Authority): I completely agree with that point. In actual fact, the Mayor's manifesto does set out using the LHIB as a way of raising awareness about air quality and targeting messages to key people and also taking action. Some of the things practically we are doing in the GLA to help that is, first of all, the Environment Team has been leading a piece of work developing guidance for the new joint strategic needs assessments (JSNA), which are being done to inform the health and wellbeing strategies. As part of that, obviously the public health professionals have so many different pressures on their time in terms of what they need to incorporate into those documents, so we are breaking down all the relevant information on a borough-by-borough basis to make it easier for them to incorporate that information to their JSNAs.

We are also moving outside of the public health system per se and working directly with the frontline medical practitioners, so there is a group of consultant respiratory doctors that we are starting to work with in terms of talking about their needs in terms of what information would be useful, how airTEXT works and so on and so forth, so that we can take that forward as well to those people who are most likely to interact with the most vulnerable Londoners who need the most information about air quality.

Onkar Sahota (AM): Does the LHIB have any statutory powers at all?

Elliot Treharne (Air Quality Manager, Greater London Authority): As I understand it - and we have been talking to our health team about the best way of integrating it into what the LHIB does - it is more of a partnership bringing together the Mayor, representatives of the boroughs and also representatives through Simon Tanner, the Regional Director for Public Health in London, and bringing them together so they can set out their priorities for London-wide action. The LHIB has already set its priorities for this year and they focus on things like obesity and on cancer. There will be ongoing discussions that we are now having about how we can integrate air quality fully into their work programme. But the LHIB, as I understand it, because of the changes in --

Onkar Sahota (AM): It is voluntary, is it not?

Elliot Treharne (Air Quality Manager, Greater London Authority): That is part of the changes in the Health and Social Care Act, as I understand it, in terms of the relationship between strategic bodies and the frontline health practitioners.

Simon Birkett (founder, Clean Air in London): I would echo the significance of these health and wellbeing boards. Jon is being very modest. I think he is going to be the public health director or might be next year for the City of London Corporation. But the priorities for the LHIB are actually alcohol abuse, childhood obesity and the prevention and early diagnosis of cancers. They are absolutely spot-on things but they must have a fourth one. There must be an air pollution one at that top level. I would really encourage on behalf of Clean Air in London this committee to look at what advice it can give in terms of identifying and sharing best practice for these health and wellbeing boards this year so that when they come in next year they have something which can guide them. Otherwise, we will be looking at this in two years' time saying, "What a pity we did not actually help them", and we would be looking at whether they had succeeded with air pollution. No, let us really do that this year. It is a tremendous opportunity.

Onkar Sahota (AM): Air quality will impact on all these areas, on obesity and also as a carcinogenic agent, so will not the Mayor be invasive on this issue? He could be much more active rather than saying, "Will you good guys get together and do something about it?" He could be a lot more positive.

Elliot Treharne (Air Quality Manager, Greater London Authority): We actually have not had the discussion formally at the LHIB level. We have just been having discussions in terms of taking forward the commitment in the Mayor's manifesto at officer level and those discussions need to take place. Matthew will be able to better comment in the coming weeks and months about how it has been taken forward and about the level of involvement of the Mayor.

Onkar Sahota (AM): I have to say that I am a practicing medical practitioner apart from being an Assembly Member and I have seen no emphasis upon air quality being put in our part of London. The Mayor can take a lead on this. We talked about cross-boundary issues of bad air coming over from Europe, right, but there is bad air coming from Camden into Westminster and all those things, so I think there is a huge problem in London. The Mayor can be much more proactive in his approach on that.

Murad Qureshi (Chair): We will certainly be pursuing that issue when we do discuss as a committee the formation of health and wellbeing boards anyway and I suspect there will be a consensus. It is actually one of those areas where you can have synergy between the health and the environment agendas on the Committee, so thank you certainly for endorsing that. Are there any more last points on the public health aspects as we come to the end of our session? Jon, did you have anything else?

Jon Averbs (Port Health and Public Protection Director, City of London Corporation): Nothing else. But do ask Simon.

Simon Birkett (founder, Clean Air in London): There were two things just to highlight quickly. The first is that Clean Air in London is concerned about high air pollution levels in the London Underground and it would be very good if the Mayor asked the Government to invite the Committee on the Medical Effects of Air Pollutants (COMEAP) to update their advice from 2002 about the health effects and what advice should be given to people about air pollution in the London Underground.

The second thing is to draw to your attention that the proposal to suspend the M4 bus lane and James and Kit were talking about the bus lane in Marylebone Road. The report produced for the Highways Agency and the Department of Transport shows that in 2011 it resulted in an unlawful increase of NO₂ at what they call sensitive receptors, which is basically people living in Hounslow. It is proposed to remove this bus lane for the Olympic Route Network in two weeks' time on 15 or 16 July. I had an email last Tuesday night saying that the Highways Agency is now looking at mitigation measures for the removal of this bus lane. So this is the sort of thing that, really, we just cannot wait to deal with in due course.

Murad Qureshi (Chair): Thank you for pointing that out, Simon. I tried to keep Onkar on Hounslow matters and you have certainly indicated the issues there. But do you know something about that?

Elliot Treharne (Air Quality Manager, Greater London Authority): The London Underground is what I was actually going to pick up very quickly, just to say that a study has been done looking at the air pollution and any issues related to that on the London Underground. I am of course happy to share that. In terms of the ongoing monitoring of that, obviously London Underground has a Health and Safety Executive commitment as well more broadly that obviously the application of EU limit limits which do not technically apply underground. But obviously as a result of that it is very closely monitored. All that information is available. I think there have been a number of Mayor's Questions on this point as well, so from our perspective we are quite satisfied about the level of air quality on the London Underground.

Murad Qureshi (Chair): So that deals with all the loose ends. There is just one I have which I will just make public and I will address it to Gary because I think you are the best person to deal with it.

There was a BBC report that suggested that around Heathrow you have something like 2,000 additional premature deaths as a result of activities around the airport. That came from a Massachusetts Institute of Technology (MIT) report. I will forward that to you to gauge a view. I did not actually understand the science but I suspect, Gary, you are the person who would understand it better than I would. It sounds as though you have not come across it.

That is the one loose end from my end, which Tony would have been interested in. Are there any loose ends at all from the Assembly Members before I close the session?

Jenny Jones (Deputy Chair): No.

Murad Qureshi (Chair): Thank you very much, experts, for coming along. I think we have covered a lot of ground today.



City of Westminster



Mayor of London
Greater London Authority
City Hall
The Queen's Walk
More London
London SE1 2AA

15th June 2012

Dear Mayor,

Working together to improve Air Quality in Central London

We are writing as leaders of Camden and the City of Westminster, and Chairman of the Policy and Resources Committee at the City of London Corporation, because poor air quality is one of the most pressing environmental and health issues facing Central London. A study you commissioned attributed over 4,000 premature deaths to it in London in 2008. Poor air quality also has significant economic effects e.g. through exacerbating sick absence due to respiratory and other diseases. It is a major concern for our residents and workers.

We support your Air Quality strategy, but further action needs to be taken urgently. Members and officers from our authorities have started to work with the GLA and TfL to this end. We met recently with them and outlined what needs to be done. A note of this is attached. In brief the actions we believe are necessary are:

For buses - which account for nearly half the NOx emissions:

- ▲ a review of the network to reduce congestion, and improve load factors, particularly on the routes with the poorest air quality.
- ▲ deployment of those buses fitted with the NOx abatement equipment on such routes – provided your people can assure us it really does achieve the amazing reductions (88%) claimed.

For taxis - which account for nearly half the PM10 emissions:

- ▲ to reduce the age limit from 15 years to 10 years
- ▲ a review to identify a lower limit than 10 years for private hire vehicles
- ▲ a review of taxi licensing and the possible use of new technology to reduce pollution
- ▲ to offer funding or grants to taxi drivers to help them upgrade their taxis

For the LEZ a number of actions to make phase 5 effective.

Your new term offers a real opportunity to deliver significant improvements in the air quality of Central London. We jointly look forward to working with you and your team to seize this opportunity.

Yours sincerely,

Cllr Philippa Roe
Leader
Westminster City Council

Cllr Sarah Hayward
Leader
Camden Borough Council

Cllr Mark Boleat
Chairman, Policy and Resources
Committee
City of London Corporation

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Air Quality in London – briefing note to GLA Environment and Health Committee

July 2012

KING'S
College
LONDON

University of London

July 2012

Gary Fuller and Louise Mittal

Environmental Research Group

King's College London

Title	Air Quality in London – briefing note to GLA Environment and Health Committee
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
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Approved by	Dr. Gary Fuller		2 nd July 2012
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Summary

This note provides results from air quality monitoring carried out in London during 2011 and looks at changes in nitrogen dioxide and PM₁₀ concentrations since 1998. Provisional results for 2011 indicate that the annual mean National Air Quality Strategy Objective (which mirrors the EU Limit Values) for NO₂ was breached at the majority of locations close to roads and at five locations away from busy roads. The NAQS objectives for PM₁₀ which are in line with the EU Limit Values although the assessment method for the EU Limit Value allows several factors to be taken into account including the influence of natural sources. Two kerbside, three roadside and one industrial monitoring site measured more than the NAQS objective of 35 days with mean PM₁₀ above 50 µg m⁻³.

Changes in pollution linked to the London Low Emissions Zone (LEZ,) health research and the provision of air quality information to the public are also described briefly.

Annual mean air pollution concentrations during 2011

Pollution concentrations are measured in London by the London Air Quality Network (LAQN), a unique partnership between King's College London and the London boroughs, along with several local authorities outside London, Defra and TfL. Air pollution is measured continuously at around 100 monitoring sites. Of this number fifteen London monitoring sites are used by Defra for the assessment of EU Limit Value compliance and are reported to the EU Commission.

At the end of each year monitoring and calibration equipment at each site is briefly subjected to a series of extensive independent tests. For the majority of local authority monitoring sites these tests are carried out by the National Physical Laboratory. Measurements from the previous year are finalised following these tests. The measurements presented below are therefore provisional for 2011.

Nitrogen dioxide (NO₂)

Provisional annual mean NO₂ concentrations for 2011 are shown in Figure 1. The annual mean National Air Quality Strategy (AQS) objective / European Union (EU) limit value of 40 µg m⁻³ is shown as a broken red line. The AQS objective was exceeded alongside almost every road where measurements took place. The greatest concentrations, over three times the AQS objective, were measured at kerbside sites in Putney and Brixton. Away from roads, in background and suburban areas, the AQS objective was exceeded at five locations. These were in inner London, in some busy outer London centres and close to Heathrow and the M4.

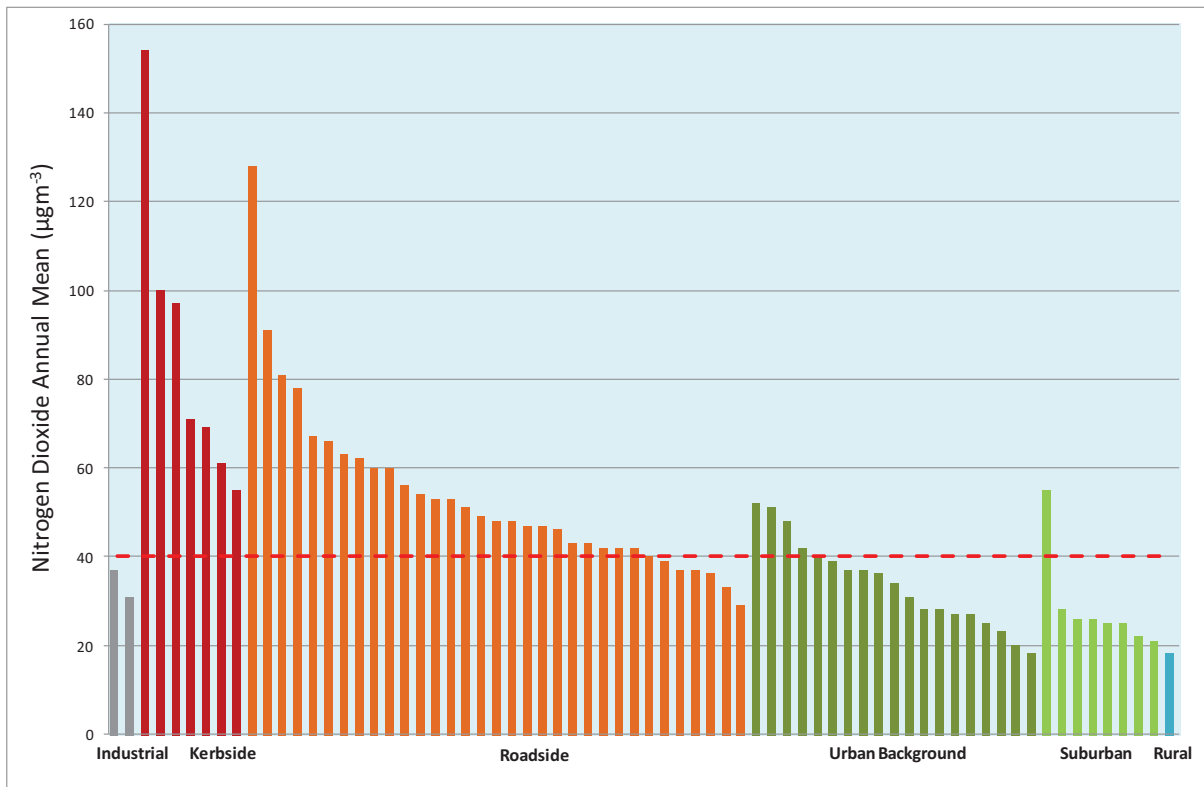


Figure 1 Provisional annual mean NO₂ at LAQN sites during 2011. The NAQS objective / EU LV is shown as broken red line and sites are grouped by type.

The NAQS and EU Directives also include limits on short-term exposure to NO₂ which is set at a maximum of 18 hours per year with mean NO₂ above 200 µg m⁻³. Such high concentrations of NO₂ are mainly confined to locations close to busy roads. However as shown in Figure 2, nine kerb and roadside locations exceeded this threshold by a very large margin.

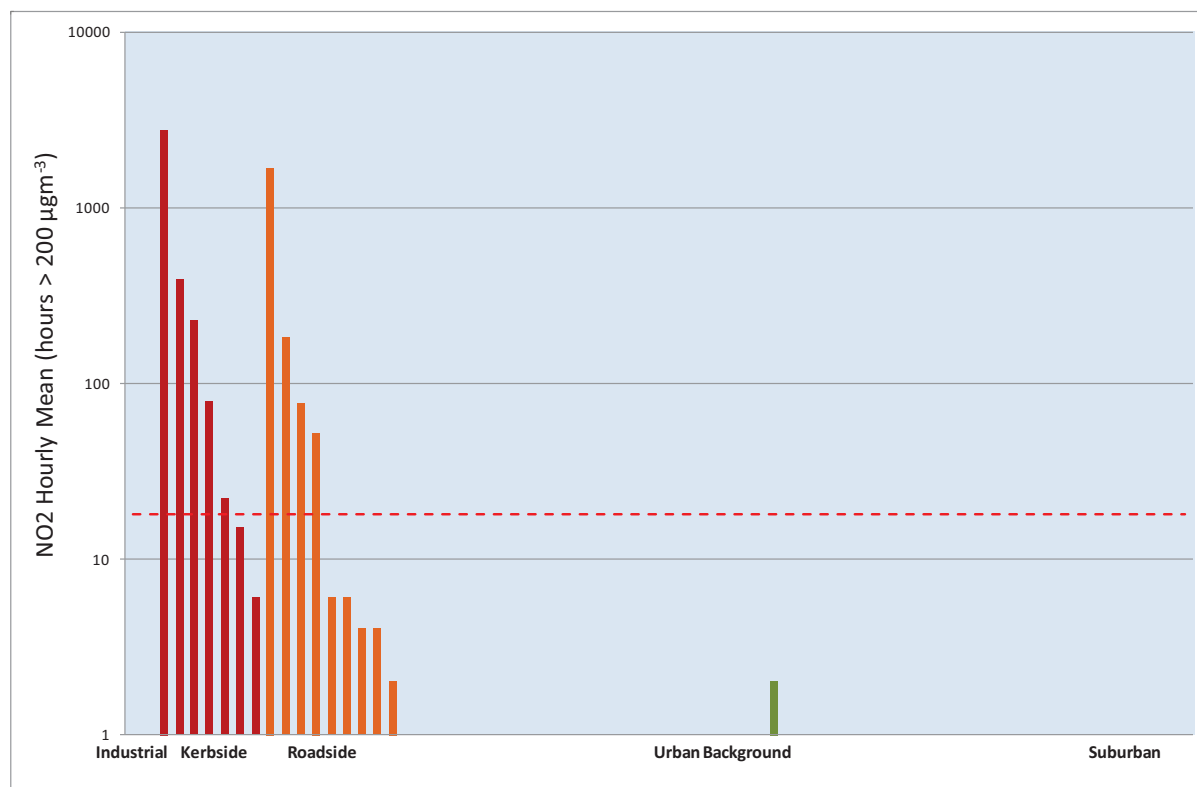


Figure 2 Provisional number of hours with $\text{NO}_2 > 200 \mu\text{g m}^{-3}$ at LAQN sites during 2011. The NAQS objective / EU LV is shown as broken red line and sites are grouped by type. Note the logarithmic scale on the y axis.

NO_2 is largely a secondary pollutant with concentrations being determined by a combination of emissions of both NO and NO_2 and the capacity of the atmosphere to convert NO to NO_2 . For this reason concentrations of NO_2 cannot be understood without considering the total concentrations of NO and NO_2 , termed NO_x .

Monthly mean NO_x concentrations are shown in Figure 3. Mean NO_x concentrations are greater at roadside locations when compared with background. NO_x concentrations at all site types show a clear seasonal variation with the greatest concentrations being measured in winter due to poor pollutant dispersion at this time. Overall, concentrations of NO_x have fallen across all site types with concentrations falling fastest at roadside sites, though the rate of decline decreased around 2001 and concentrations but have been more stable since. The overall decrease in NO_x concentrations reflects the abatement of vehicle emissions, however, the recent stability gives rise to concern regarding control of NO_2 concentrations. The sharp reduction in NO_x concentrations at Marylebone Road during 2001 reflected the introduction of a bus lane at this time.

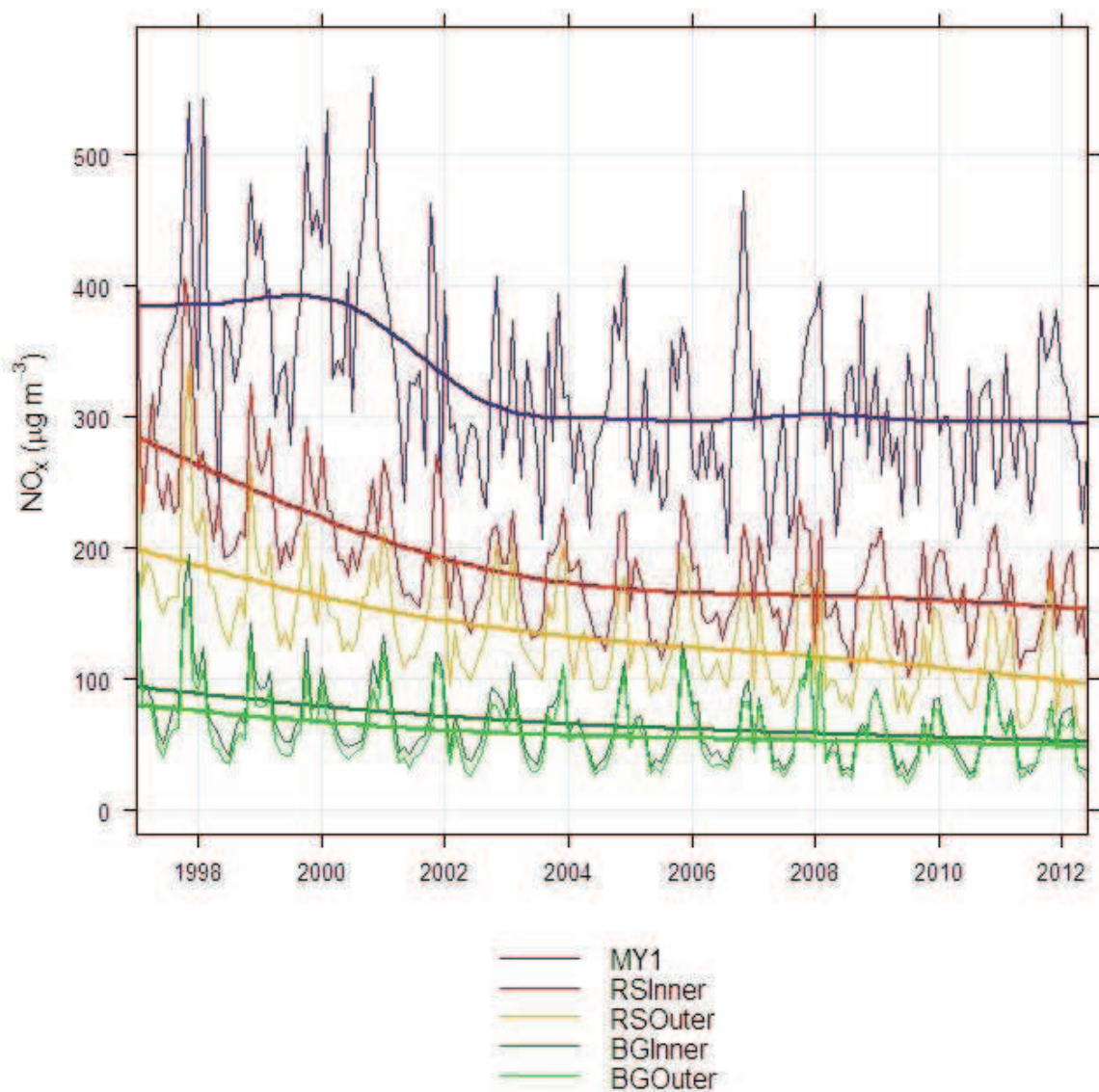


Figure 3 Monthly mean NO_x concentrations at selected London monitoring sites. MY1 = Marylebone Road, RS= Roadside, BG = background, Inner and Outer refer to inner and outer London.

In line with NO_x concentrations, concentrations of NO₂ were also greatest at roadside sites with lower concentrations measured at background locations. Like NO_x, NO₂ concentrations are generally higher in wintertime due to poor dispersion.

As shown in Figure 4, NO₂ concentrations away from roads have declined since 1998 but the rate of decline has weakened in recent years. The apparent sharp declines in NO₂ concentrations during 2011 and 2012 appear to conflict with those of NO_x and should be treated with caution at this stage. Importantly, the annual mean AQS Objective and EU Limit Value of 40 µg m⁻³ has been attained at background sites in outer London only and this concentration has been consistently exceeded at background sites in inner London and at roadside sites throughout London. It is clear that the difference between NO₂ concentrations at roadside and at background sites increased since 1998. This can be attributed to an increase in the proportion of NO₂ being directly emitted in vehicle exhausts.

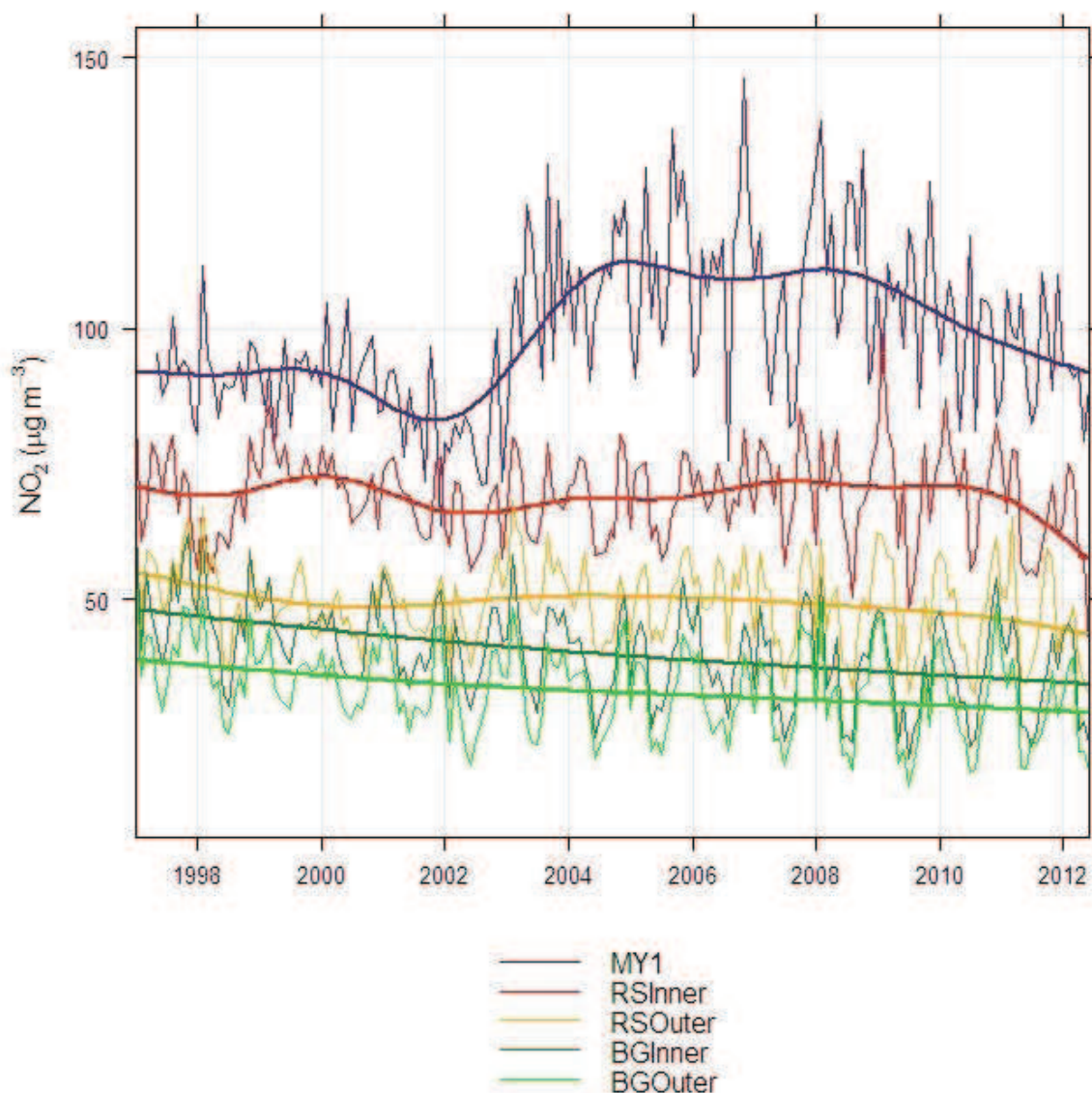


Figure 4 Monthly mean NO₂ concentrations at selected London monitoring sites. MY1 = Marylebone Road, RS= Roadside, BG = background, Inner and outer refer to inner and outer London.

Measured concentrations of NO_x and NO₂ in London were examined in detail by Beevers et al (2010) and compared to the expected changes from the progressive tightening of Euro emissions standards. It was found that NO_x and NO₂ concentrations were not responding as expected to the projected decreases in vehicle emissions. There has also been an increase in the proportion of NO₂ (relative to NO_x) being directly emitted from newer diesel vehicles as highlighted Carslaw (2005) and by the UK Air Quality Expert Group (AQEG, 2007).

The work of Beevers et al (2010) was followed by an analysis of tests on approximately 72,000 vehicles by Carslaw et al (2011). It found that the progressive tightening of Euro standards had not been effective for diesel cars/vans and there had been little change in total NO_x emissions over the past 15-20 years from these vehicle types. This may be partially explained by an increase in the power of diesel cars and that Euro 3–5 diesel cars can emit up to twice the amount of NO_x under higher engine load conditions compared with older generation vehicles. This is possibly the result of

the increased use of turbo-charging in modern diesel cars. There has also been an increase in the proportion of diesel vehicles sold since 2000.

NO_x emissions from HGVs were static until Euro IV, when NO_x decreased by about one third but the report raised questions regarding the emerging issue of the performance of selective catalytic reduction (SCR) used on HGVs which has been shown to be ineffective under urban-type (slow speed, low engine, temperature) conditions such as those prevailing in urban areas.

In contrast to diesel vehicles, NO_x emissions from new Euro 5 petrol vehicles have reduced by 96% since pre-Euro (non-catalyst) vehicles, although older petrol vehicles (Euro 1-3) emit higher emissions of NO_x than previously thought which may suggest that older petrol engine catalysts deteriorate faster than expected.

Despite their lower NO_x emissions the full benefit of petrol engine emissions control has been partially offset by a decrease the proportion of new petrol cars sold each year and the progressive increase of diesel vehicles. Petrol cars decreased from 86% in 2000 of new car sales to 48% in 2011 (SMMT, 2012). Incentivisation of small petrol and petrol hybrid cars may be a tool to tackle urban nitrogen dioxide.

PM₁₀

PM₁₀ comprises of particles with different chemical composition from a variety of sources including primary emissions, secondary particles produced by chemical reactions in the atmosphere and particles from natural sources such as windblown dust and sea salt. There are two NAQS objectives for PM₁₀ in line with the two EU Limit Values however the assessment method for the EU Limit Value allows several factors to be taken into account including the influence of natural sources. Of these natural sources sea salt is especially relevant to London. Other aspects of the assessment method mean that the final assessment of London's compliance with EU Limit Values for PM₁₀ rests with Defra and cannot be interpreted directly from pollution measurements of the air that Londoners breathe.

The daily mean NAQS objective and the daily mean Limit Value are the most stringent of the PM₁₀ limits. These permit no more than 35 days per year with mean PM₁₀ above 50 µg m⁻³. The annual count of days with mean PM₁₀ above 50 µg m⁻³ is shown in Figure 5. Two kerbside and three roadside monitoring sites measured more than 35 days. Some of the greatest concentrations of PM₁₀ in London were measured in residential areas close to a small number of waste management sites. These are the focus of increased regulatory efforts by the Environment Agency and boroughs. The annual number of days with mean PM₁₀ above 50 µg m⁻³ has decreased at the Neasden Lane (Brent) and Horn Lane (Ealing) industrial monitoring sites from 174 days and 205 days respectively during 2005.

Peaks in mean PM₁₀ concentrations occur during prolonged periods of stable weather conditions. During wintertime pollution incidents PM₁₀ in London can be dominated by London sources. High-pressure systems can also lead to the import of polluted air from elsewhere in the UK and Europe. Alone or when combined with local pollution from London this can lead to days with mean PM₁₀

above $50 \mu\text{g m}^{-3}$. New measurements of the chemical composition of PM in London are highlighting the importance of nitrate particles in the PM_{10} imported into London. These arise from emissions from both traffic and industry. Whilst control of these types of pollution episode may appear beyond London’s control, this type of pollution episode was placed in its correct context during March 2012 when winds brought our own air pollution back to us demonstrating how our cities contribute to poor air pollution in areas over hundreds of kilometres away. Tackling local air pollution can improve the health of people who live near busy roads and decrease the impacts of each city on the wider region.

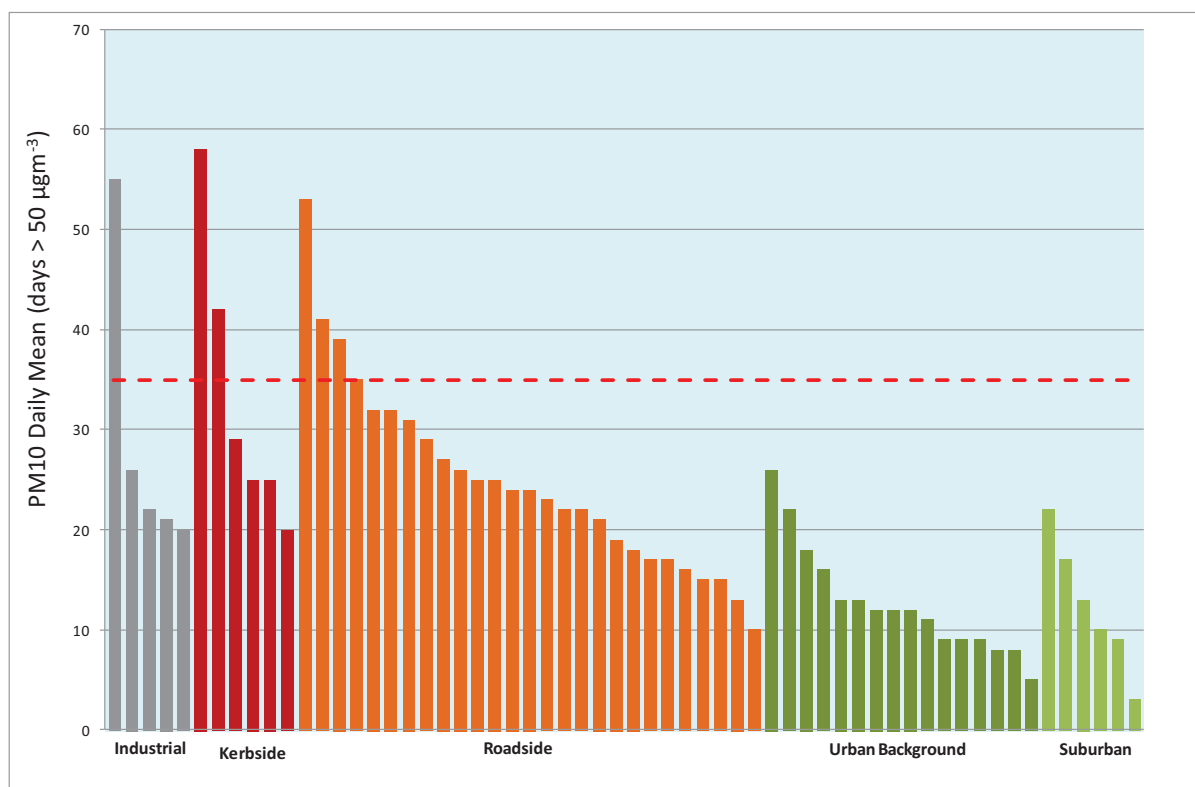


Figure 5 Number of days with mean $\text{PM}_{10} > 50 \mu\text{g m}^{-3}$ LAQN sites during 2011. The NAQS objective is shown as broken red line and sites are grouped by type.

Measurement of PM_{10} presents many scientific and technical challenges. Consistent measurements to EU reference methodology date back to 2004 but the assessment of changes over time is complicated by the progressive updating of measurement equipment. Monthly mean concentrations of PM_{10} are shown in Figure 6. These suggest relative stability in PM_{10} concentrations across all site types. Further analysis would have to be undertaken to determine any actual underlying trend. Fluctuations in the measured concentrations at Marylebone Road are due to the variability at a single site whereas measurements from other locations represent composite measurements from several monitoring sites.

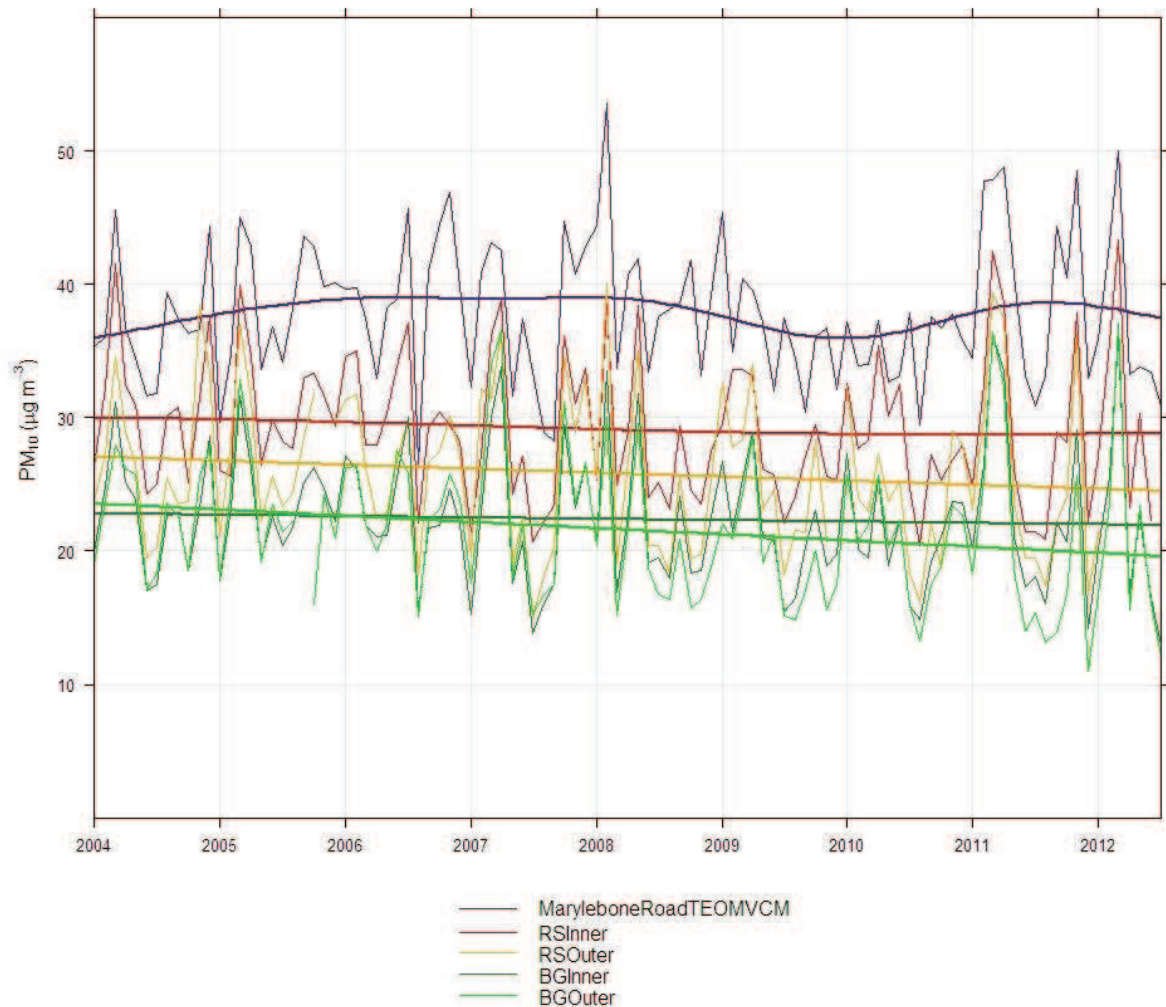


Figure 6 Monthly mean PM₁₀ concentrations at selected London monitoring sites using the TEOM VCM method. RS= Roadside, BG = background, Inner and outer refer to inner and outer London.

There are several different ways to measure airborne particles and although the mass concentration is the regulatory method other metrics have been linked to health effects. From a toxicological perspective it has been suggested that the oxidative potential might best represent the challenge that PM provides to the lung. King's are an international leader in these measurements and several programmes are underway to determine the oxidative potential of London's PM including work under the TRAFFIC research project (see below). Measurements show greater oxidative potential in London when compared with rural areas and are greater close to roads in London (Mudway et al 2011).

It has also been suggested that the number of particles per unit volume of air may be linked to health effects. A study by Atkinson et al (2011) found that daily changes in particle number were associated with increased hospital admissions for cardiac problems. A large decrease in particle number has been found in London (and Birmingham) since late 2007 and this is thought to be due to the introduction of ultra-low sulphur diesel across the UK (Harrison et al 2012) as shown in Figure 7. It remains to be investigated if this change in particle number has been reflected in health data.

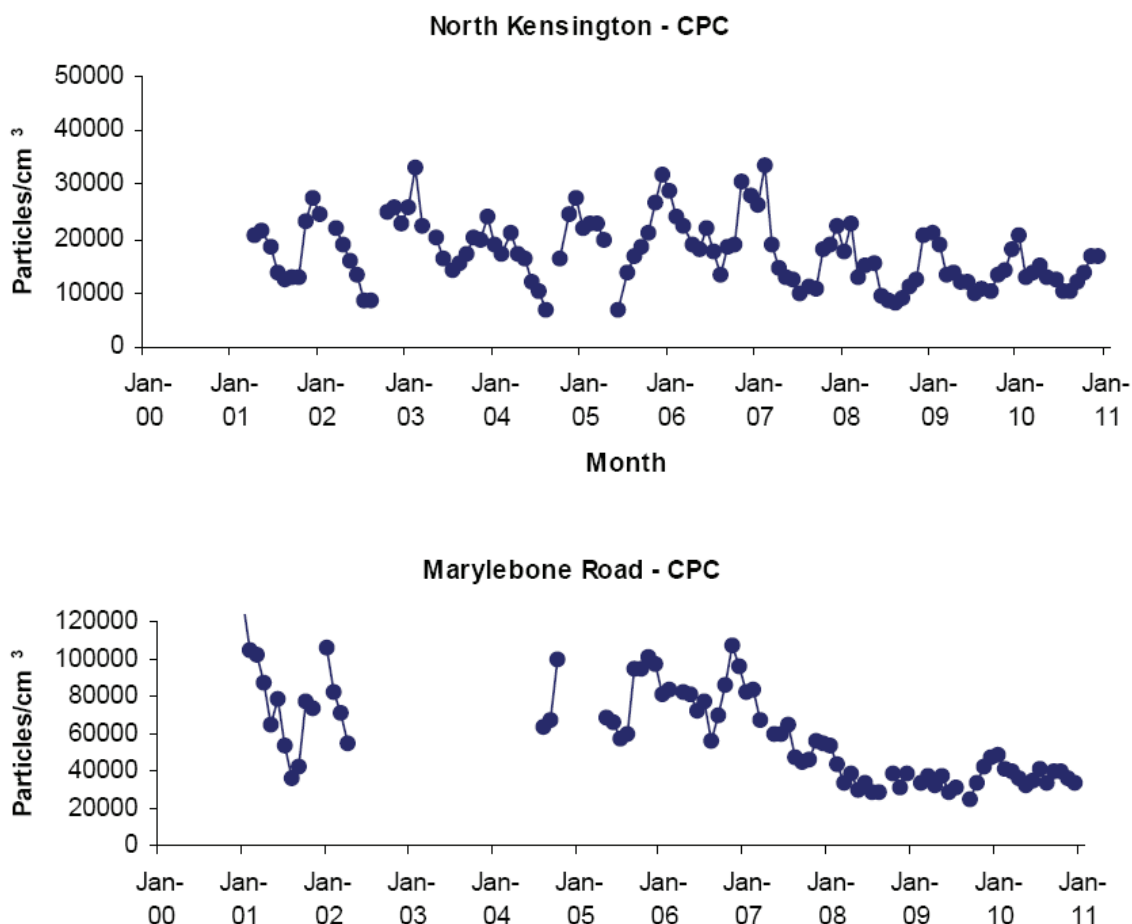


Figure 7 Monthly mean particle number concentration at the North Kensington background site and at Marylebone Road from Beccaceci et al 2011.

The London Low Emission Zone (LEZ)

The London Low Emission Zone was introduced in 2008 with further phases on 1st January 2012. Assessment of the effectiveness of the 2008 LEZ phases was undertaken at a set of so-called LEZ super sites funded by TfL and individual boroughs.

Figure 8 shows black carbon concentrations alongside four London roads along with PM_{2.5} and from the nearby road itself. No clear decreases can be seen in PM₁₀ concentrations but local concentrations of PM_{2.5} and black carbon (an indicator for vehicle exhaust particles) showed decreases at sites in outer London on the North Circular and beside the Blackwall Tunnel north approach prior to the LEZ (indicating pre-compliance) and following the introduction of the scheme. The absence of clear changes in central London may reflect differences in the vehicle mix in central London with a smaller proportion of vehicles affected by the LEZ when compared with trunk roads in outer London.

There is a clear need for a detailed assessment of the implementation of phase 3 and 4 of the LEZ at the start of 2012.

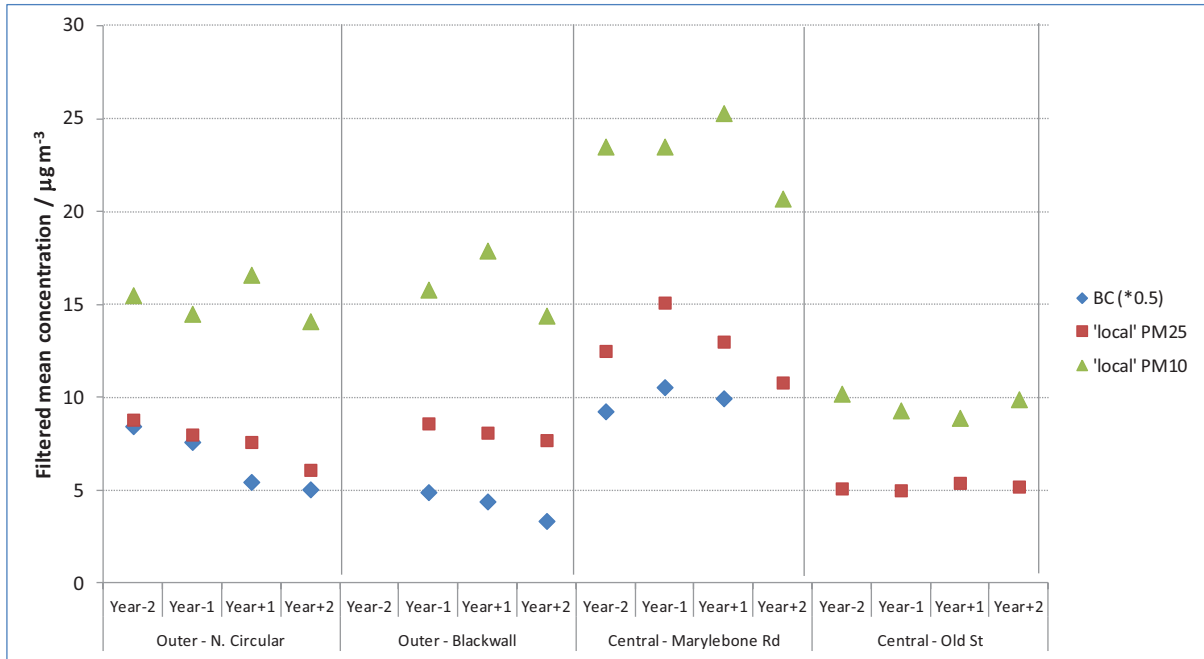


Figure 8 Annual concentrations of black carbon (BC) and PM_{2.5} and PM₁₀ from local sources in the years before and after the LEZ implementation in 2008.

New air pollution and health research in London

King's College London is taking a lead role in several new large scale research projects underway in London:

Roadside vehicle exhaust measurements:

Between 2007 and 2010 a programme of remote drive-by testing was carried out on approximately 72,000 vehicles and analysed by Carslaw et al 2011. This included measurements within London in urban-type driving conditions to investigate why recent concentrations of NO_x and NO₂ in the UK have not decreased as anticipated. The analysis, funded by Defra highlighted that NO_x emissions from diesel vehicles, and diesel cars in particular, have not declined in line with the expectations from the introduction of pollution abatement equipment on new vehicles.

King's College London is leading a further programme of vehicle testing in London along with the University of Newcastle. The programme is funded by a Defra local authority grant with the City of London, Ealing and Southwark and aims to better characterise emissions from different vehicle types in real-world situations using unique experimental equipment from the University of Denver.

ClearfLo: Funded by the Natural Environment Research Council this project involves 11 UK universities and has made substantial investment air pollution monitoring sites alongside meteorological measurements to investigate pollution across London. The ambition of ClearfLo is to provide long-term integrated measurements of the meteorology, composition and particulate loading of London's urban atmosphere, made at street level and at elevated sites, complemented by modelling to improve predictive capability for air quality.

TRAFFIC: The Traffic and Air Pollution in London project is funded by a £2million grant under the cross-Research Council Environmental Exposure and Health Initiative (EEHI) with funds from the Natural Environment Research Council (NERC), the Medical Research Council (MRC), and the Department of Health (DoH). King's are leading a consortium of over 20 investigators from Imperial College London, St George's, University of London and The London School of Hygiene and Tropical Medicine. The project will run from 2011 to 2014 inclusive.

The first part of the study is concerned with detailed measurements of air pollutants with chemical analyses of particles to investigate their toxicity and sources.

This will include linking these results to daily data from registries of deaths and hospital admissions to study which mixtures and sources of particles are most likely to have adverse effects. It will be one of the first studies to link epidemiological analyses to laboratory analyses in this way.

The second part is the development of models of exposure to air pollution which draw on information about concentrations, emissions and time-activity. This includes a novel approach using anonymous Oyster card information and/or GPS on mobile phones, which will then be analysed alongside pollution measurements to create a mathematical model. This model will provide a way of investigating the effects of various policy scenarios on actual exposure of population sub-groups. It will provide a guide to enable people to adapt their journeys if desired and where possible to reduce their exposure to harmful vehicle emissions. Lastly, it will improve the estimation of exposure for health studies which generally rely only on concentrations at the postcode or address level.

The third main component is to investigate the association between long term exposure to traffic pollution, indicated by concentrations at address or postcode, and a range of potential health effects from cradle to the grave.

These include effects on children's health and risk factors for future cardiovascular disease, adverse reproductive outcomes (low birthweight and pre-term delivery), primary care data on disease and consultations, the incidence of heart attacks, hospital admissions and mortality. This will be the first study to bring all these outcomes together in a coordinated way and with the explicit aim of developing exposure-response relationships for use in health impact assessments.

EXHALE: Funded by the National Institute for Health Research's comprehensive Biomedical Research Centre (BRC), this project will investigate the impact of the LEZ on children's respiratory health.

Specifically, the project will assess whether the reduction in exposure to traffic emissions resulting from the LEZ will be associated with improvements in lung function. The study focuses on children in East London, as the LEZ is predicted to have a significant impact on air quality in this area.

The study involves conducting health assessments in 8 to 9 year-old children at selected schools in Tower Hamlets and Hackney. The assessments include measurements of respiratory health, biomarkers of exposure to traffic-related air pollution, genetic susceptibility to the effects of air pollution, and systemic response to air pollution.

The health data is then linked to modelled air quality data, provided by Kings' modelling team, to provide a comprehensive picture of the effects of traffic-related air pollution on children's health, and the impact of the LEZ on this. The study will last for 4 years, with health assessments conducted

each winter. As of June 2011, King's have completed 3 years of data collection, and over 1000 children from 23 schools have participated.

As part of the study, scientists from King's provide a morning of education for the Year 4 class at each school visited, teaching students about the science and history of air pollution. This year, King's have also been working with a professional artist, Effie Coe, as part of the Invisible Dust project. Effie has designed art activities specifically to help the children understand and visualise the scientific concepts they are learning. The video below was made at one of our most recent school visits and shows the health assessments, as well as some of the teaching activities in the classroom.

The study is a collaborative project between members of the Environmental Research Group at King's College London, and the Centre for Health Sciences at Barts and the London School of Medicine and Dentistry.

Improved air pollution information for Londoners

The 2011 House of Commons Environmental Audit Committee's 2011 report on air quality concluded that, "A public awareness campaign would be the single most important tool in improving air quality. It should be used to inform people about the positive action they could take to reduce emissions and their exposure."

The new UK Daily Air Quality Index was launched by Defra at the start of 2012. The index is used to communicate information about real-time pollution exposure and to forecasts of expected levels of air pollution for the public. The new index includes PM_{2.5} for the first time and is supported by revised health advice. With advanced warning of poor air quality, individuals who are sensitive to the effects of air pollution can have the opportunity to modify their behaviour to reduce the severity of their symptoms.

In addition to national air quality information from Defra, London has the most advanced air quality information systems of any city in Europe.

Innovatively this includes the LondonAir free smart phone application which allows users to access air pollution information on the move. Users can also subscribe without charge to be notified of air pollution at their local monitoring site or when a pollution threshold has been breached. Designed and developed by the monitoring team at King's the new iPhone application gained over 6000 subscribers during its first two weeks and peaked at over 13,000. During the Easter 2011 pollution episodes King's sent out over 400,000 pollution notifications to iPhone subscribers.

The LondonAir site is the prime source of air pollution information for the capital. During pollution incidents, several thousand visitors per day view the latest pollution concentrations which are updated each hour. The website was re-designed in 2011 following consultations with regular users of the site. This includes a guide, revised to adopt an accessible style and incorporate additional information on health and the latest research. The LondonAir website also includes videos for eleven important topics, interviewing experts on the subject. A mobile version of the website allows people to access air pollution levels at any time and place, and complements the LondonAir smart phone

applications. The LondonAir website and smartphone applications will be updated during July ahead of the London Olympics to provide specific information for Games visitors. Additional air quality information is provided on both Facebook and hourly updated Twitter feeds.

The long-standing AirTEXT service continues to provide SMS air pollution forecasts and will be shortly launching a smartphone application.



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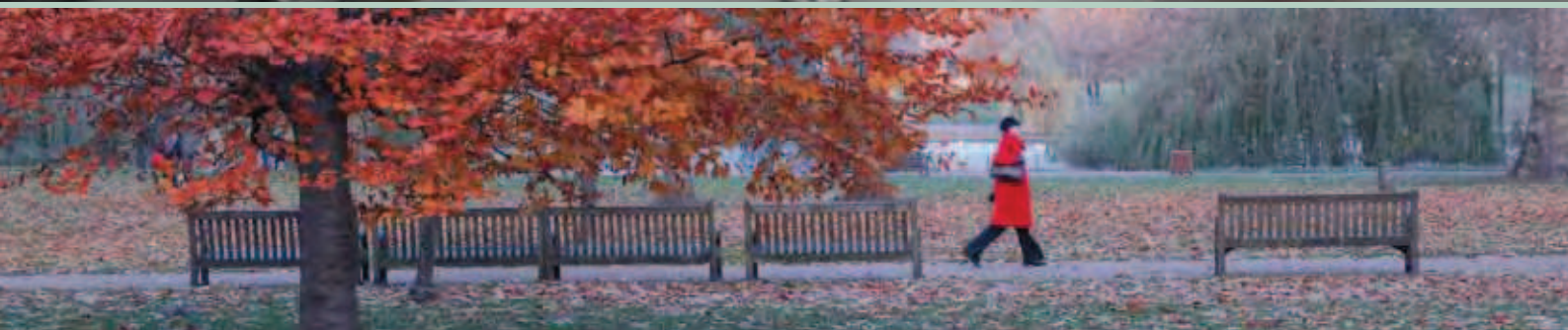
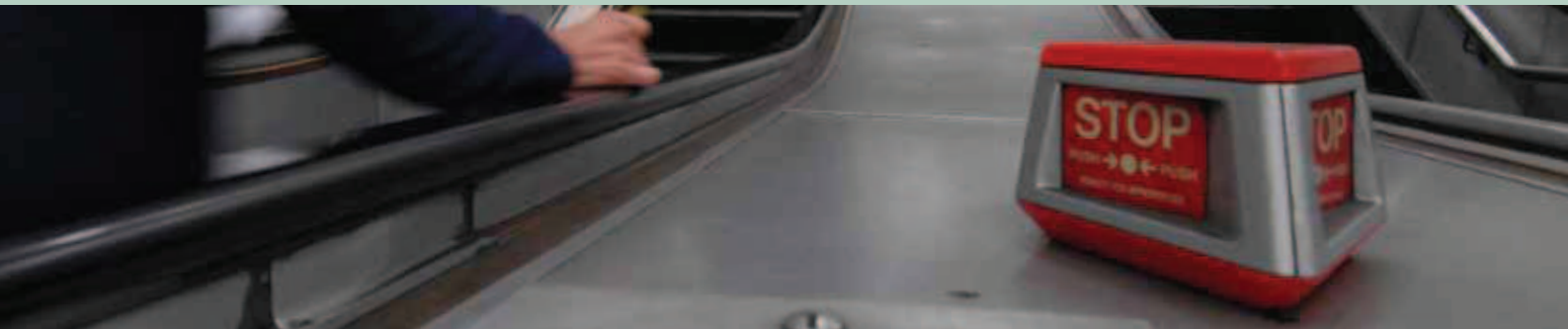
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Health, safety and environment report 2011



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Message from the Commissioner



The Mayor has a clear and compelling vision for the future of London's transport and Transport for London (TfL) is delivering it.

We also recognise the importance of delivering the Mayor's vision sustainably. This means that we must operate all aspects of our business so that they benefit our customers, users, employees, London's communities and the environment.

With record numbers of people using our services, their health and safety remains our priority. We have continued our relentless drive for improved results and I am pleased to announce that this year there were no accidental customer fatalities and that the customer major injury rate has decreased significantly over the last five years.

A huge amount of work has been done to improve the Capital's transport system to meet the needs of our growing city. The Tube upgrades and the construction of Crossrail continued at pace while keeping their environmental impact to a minimum. The success of our approach has seen us meet our challenging construction and demolition waste recycling target ahead of schedule.

We have continued to deliver transport improvements to meet future demand.

The Capital has embraced the Barclays Cycle Hire Scheme and Barclays Cycle Superhighways, revolutionising the way that people now make short trips. Cycling, with all its social, environmental, health and financial benefits, has an important role to play in the future of the Capital.

Road safety in London has improved dramatically since the mid to late 1990s with a remarkable 57 per cent decrease in deaths and serious injuries by the end of 2010. Over the same period there was a 73 per cent reduction in the numbers of children killed or seriously injured.

We are committed to delivering better, cleaner, greener and safer transport services, and this report shows the significant steps we have made in reducing carbon dioxide (CO₂) emissions from our main public transport services. Providing Londoners with an attractive, low emissions alternative to the car will not only help London meet its climate change and air quality targets, it is also driving down costs providing better value for money for fare and tax payers.

London's transport network will play a crucial role in delivering the 2012 Games. We are committed to further delivering the Mayor's transport vision while achieving unparalleled value for money for our customers in a way that protects the environment and improves Londoners' quality of life.

A handwritten signature in black ink, which appears to read "Peter Hendy". The signature is written in a cursive style.

Peter Hendy CBE
Commissioner
TfL

About this report

This year TfL has produced an integrated health, safety and environment (HSE) report for the first time. This is intended to improve the effectiveness of our performance reporting and to focus on our strategic objectives and outcomes in relation to HSE.

Performance data and scope

This report provides an update on the HSE performance across the TfL Group from 1 April 2010 to 31 March 2011. The TfL Group comprises London Underground, Surface Transport, London Rail, Crossrail and Corporate directorates.

TfL's HSE performance is measured through the monitoring of key performance indicators (KPIs), a summary of which is provided on pages 34–40.

Health and safety performance data covers employee safety, customer safety, contractor safety and staff sickness absence.

Road safety data for Greater London and the Transport for London Road Network (TLRN) from January to December 2010 is also provided in this report.

Environmental performance data relates to London's public transport operations, including taxis and private hire vehicles (PHVs), and the support services run by TfL and its main contractors.

All environmental metrics are Group-wide unless otherwise stated and allow for year-on-year comparison where applicable. All figures have been updated to reflect the latest available data and emissions factors¹ and as such they may differ from those reported in previous years.

Some business areas have reported new environmental information for the first time and, through improvements in reporting, some previously estimated data has been replaced by actual data. Figure 1 provides a summary of the changes affecting the scope of TfL's operations that have occurred to the TfL Group over the reporting year.

TfL is committed to delivering continual improvements and will continue to work towards improving the quality of data reported in this report.

Further information

Information associated with privately owned vehicles falls outside the scope of this report. TfL publishes this material and information on London-wide emissions in its Travel in London report, which looks at trends and progress in relation to the delivery of the Mayor's Transport Strategy.

For more information about TfL's structure, the Business Plan (which sets out funded programmes until 2014–15) and Annual Report, please visit the TfL website, tfl.gov.uk

¹ All environment figures in this report have been rounded to a maximum of three significant figures

Figure 1

Operational changes to TfL in 2010/11

TfL operated more transport services than ever before in 2010/11 and a number of improvements were made to TfL's services over the reporting year that affect the scope of TfL operations and some of the data in this report.

London Underground

- In June 2010, the infrastructure company Tube Lines became a wholly owned subsidiary of TfL
- A total of 23 new trains came into service on the Victoria line and new air-conditioned trains began running on the Metropolitan line
- Work progressed on major congestion relief projects at Bond Street and Tottenham Court Road in support of Crossrail

Crossrail

- Works, including enabling works such as utility diversions, continued at Canary Wharf station
- Demolition of buildings for the Bond Street, Tottenham Court Road and Farringdon station ticket halls and for the Royal Oak portal were carried out

- The construction of the western tunnel portal at Royal Oak and the eastern tunnel portal at Pudding Mill Lane started
- Work was carried out at Whitechapel to build a deck over the East London line to facilitate construction of the Crossrail Whitechapel station

Head offices

- The whole of the head office building Palestra came under TfL control as the London Development Agency was scaled down

Docklands Light Railway

- Engineering works continued on the Docklands Light Railway to allow three-car trains to be introduced. These longer trains have been running between Bank and Lewisham since April 2010, and between Stratford and Lewisham since November 2010

London Overground

- The extension of the East London line between Dalston Junction and West Croydon opened on 23 May 2010. The new line has a fleet of 20 new air-conditioned trains, four new, bright, fully accessible stations and 18 refurbished stations with upgraded systems

Health, safety and environment management in TfL

An HSE Policy Statement was first adopted in 2004 and since then has been regularly reviewed. The statement defines the guiding principles by which TfL conducts its business and also ensures it complies with legislative requirements. The TfL Board, Commissioner and Managing Directors are committed to having HSE performance that they are proud of.

HSE management

Managing Directors are responsible for setting and delivering the implementation of HSE specific objectives for their business area. HSE directors regularly meet to provide strategic coordination on HSE matters and there is a TfL-wide group of environmental managers that coordinates and aligns environmental activities.

Status of health, safety and environment management systems

TfL has a Group health, safety and environment management system (HSEMS) that sets out how its businesses should manage HSE. HSEMSs have been developed for each business area that address their significant activities and provide assurance that HSE is being managed in a focused and systematic manner.

The systems are reviewed at least every three years for their suitability and effectiveness and annual HSE Assurance letters are produced. TfL's HSEMSs are compatible with standards such as the International Organisation for Standardisation Series 14001 and the British Standard series of Occupational Health and Safety Assessments 18001.

Engaging employees

TfL recognises the contribution employees make to the successful management of HSE. Employees are provided with HSE information, instruction, training and supervision when required.

TfL continues to raise employee awareness of environmental issues through its internal environmental behavioural change campaign, Destination Green. This includes a network of more than 230 environmental champions and 200 London Underground station energy champions. Destination Green also brings together the tools needed to enable champions and employees to bring about environmental improvements.

Working with suppliers

TfL is a large purchaser of works, goods and services. Where applicable, TfL requires those who provide works, goods or services to have HSEMSs that are compliant with national or international standards.

TfL is committed to reducing its environmental impact by working with suppliers to ensure that their products and services meet the environmental requirements of the Greater London Authority (GLA) Responsible Procurement Policy and the Mayor's Green Procurement Code.

Monitoring and reporting of performance

Progress against HSE objectives is reported periodically within each business area and to the Safety, Health and Environment Assurance Committee (SHEAC) on a quarterly basis. SHEAC reports to the TfL Board after each meeting.

Each of the business areas has effective internal HSE monitoring systems in place that are proportionate to the risks of its operations. Reporting against HSE KPIs is built into the periodic business management review cycle.

During 2010/11, TfL worked towards its environment targets, which were set in those areas where TfL considers it has the largest environmental impact. These are CO₂ emissions, air pollutants, waste and recycling.

This process of accounting, auditing and reporting material impacts, risks, incidents and trends is a central component in TfL's drive for continual HSE improvement.

Occupational health and wellbeing

Figure 2 presents sickness absence in the business areas for 2010/11. TfL uses sickness absence data to identify key health risks and consider further health interventions.

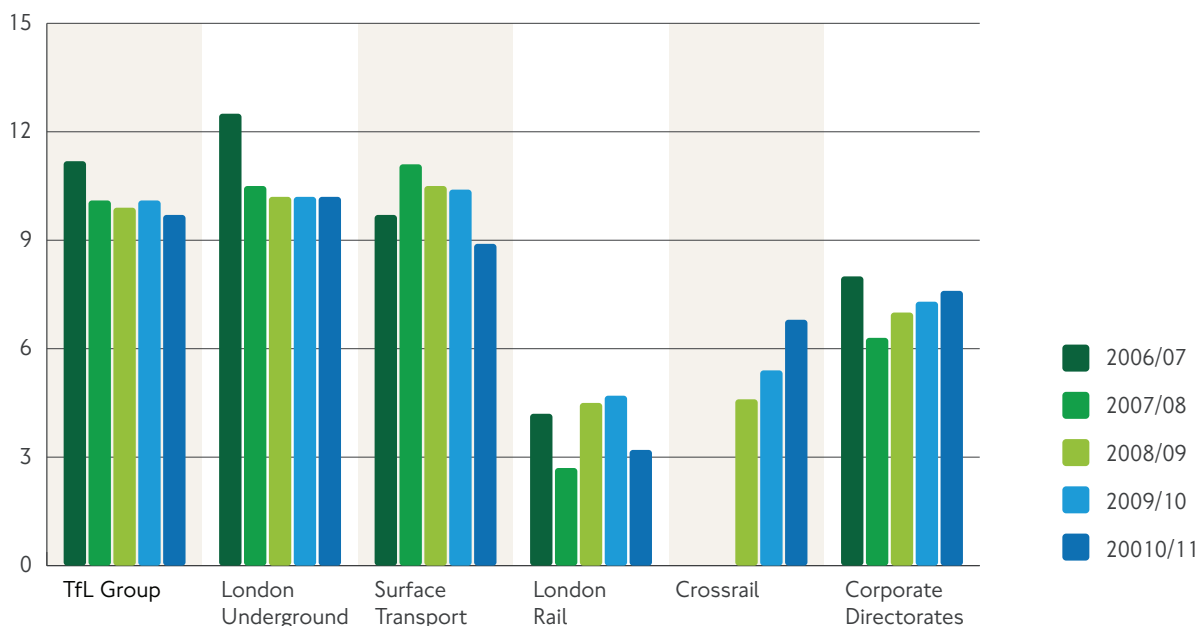
Annual sickness absence across TfL decreased from 10.1 days per full-time equivalent (FTE) in 2009/10 to 9.7 days in 2010/11.

Figure 3 shows the average days lost due to sickness absence per employee by category and business for the year 2010/11.

The three most frequently reported categories of sickness absence across TfL in 2010/11 were musculoskeletal disorders, colds and influenza and mental illness.

A number of health improvement activities were carried out during the year to address healthy lifestyles and the mental health issues of employees.

Figure 2: Average sickness absence per FTE by TfL business (2006/07 – 2010/11)



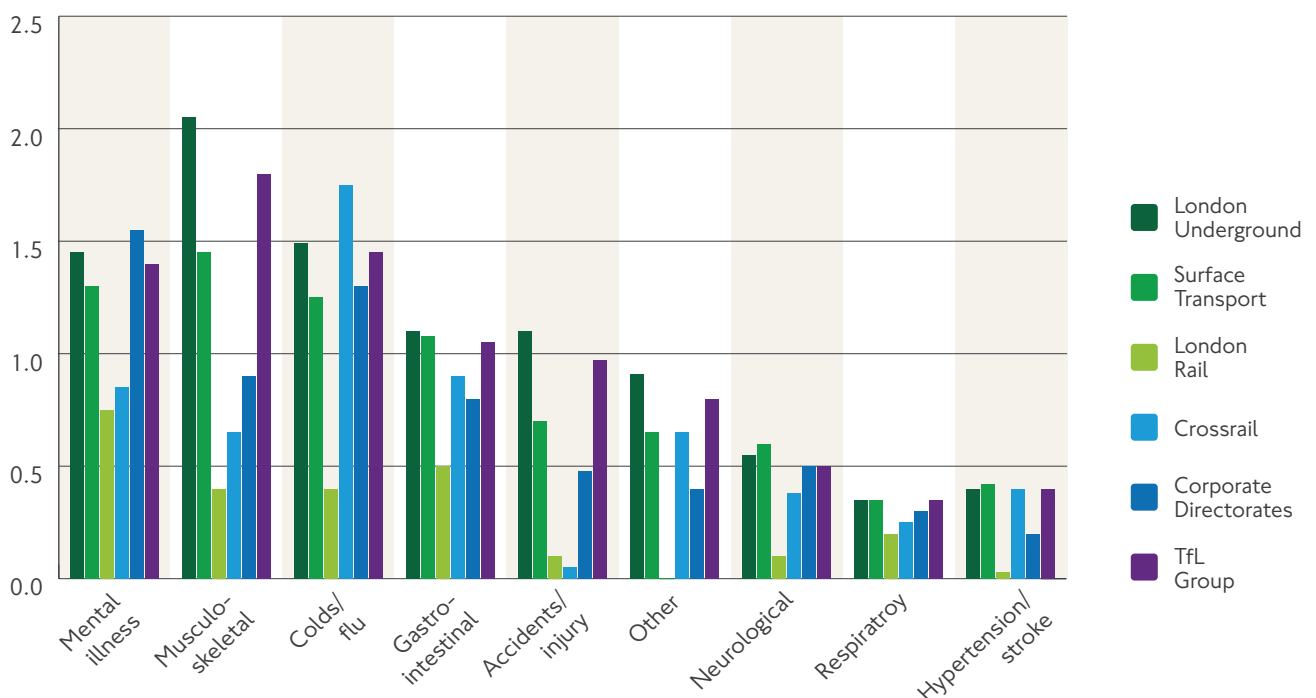
Forty-one health fairs were held in the year. Four of these took place at night – a new initiative to reach the significant group of employees who work night shifts.

The health fairs were attended by 1,995 employees during the year, with 1,135 (58 per cent) attending a health fair for the first time.

Counselling services for employees were improved by the introduction of a third party 24-hour telephone help and advice line.

In 2010/11, Crossrail signed up to ‘Constructing Better Health’ – a national industry scheme responsible for delivering standards for the improvement and management of occupational health in the construction industry. Crossrail has also introduced the requirement for its construction contractors and their subcontractors.

Figure 3: Average days lost due to sickness absence per employee by category and business area 2010/11



Safety

Employee safety

Accidents and assaults are monitored to ensure that adequate controls are in place to minimise workplace risk and injuries. TfL employee major injury and employee assault data are presented for the past five years.

Employee fatalities

There were no employee fatalities in TfL for the fifth consecutive year.

Employee major injuries

Employee major injuries are defined by the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR) and must be reported to the Health and Safety Executive or the Office of Rail Regulation (ORR).

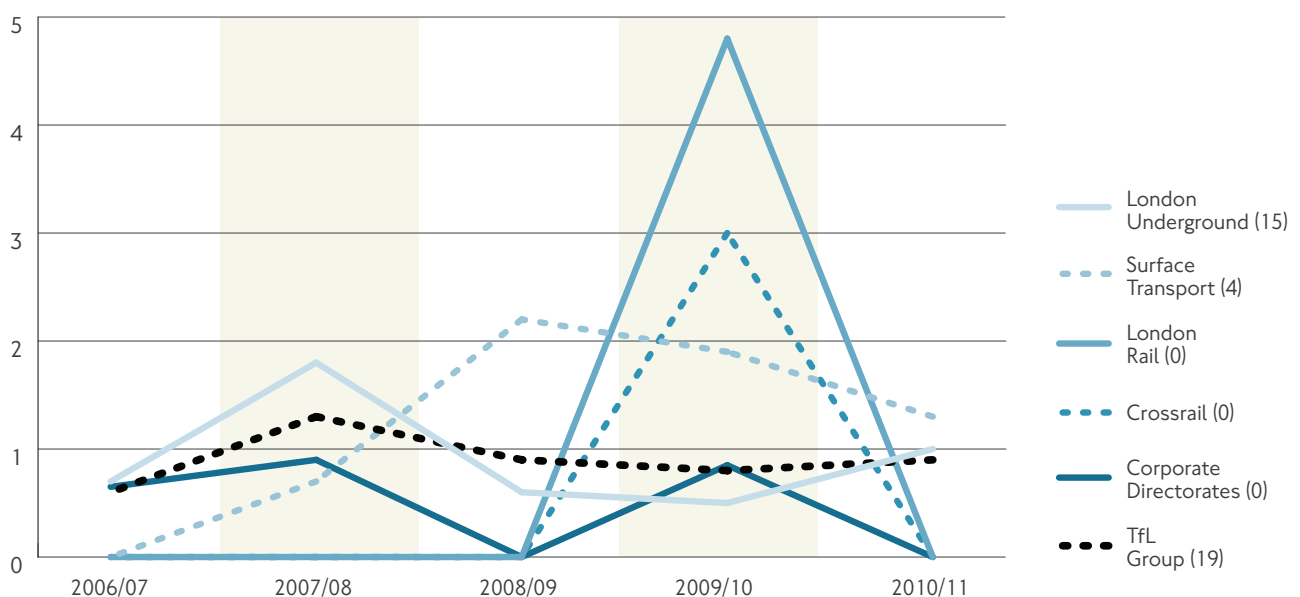
RIDDOR reportable injuries include limb fractures, injuries leading to unconsciousness or admittance to hospital for more than 24 hours.

In 2010/11, there were 19 employee major injuries in TfL, compared with 18 in 2009/10.

TfL's major injury rate for 2010/11 is 0.92 per 1,000 employees (see figure 4). This is higher than the 2009/10 employee major injury rate of 0.78. TfL's major injury rate has averaged 0.87 per 1,000 employees over the past five years.

The most recent major injury rate for the UK Transport sector reported by the Health and Safety Executive is 1.8 per 1,000 employees.

Figure 4: Employee major injury rate (per 1,000 employees)



In London Underground there was an 87.5 per cent increase on last year's employee major injuries from eight in 2009/10 to 15 in 2010/11. This is in part a result of the increased number of employees working on maintenance, projects and upgrades.

In Surface Transport, there was a 43 per cent decrease on last year's employee major injuries from seven in 2009/10 to four in 2010/11.

There were no employee major injuries in London Rail, Crossrail or the Corporate Directorates.

Employee assaults

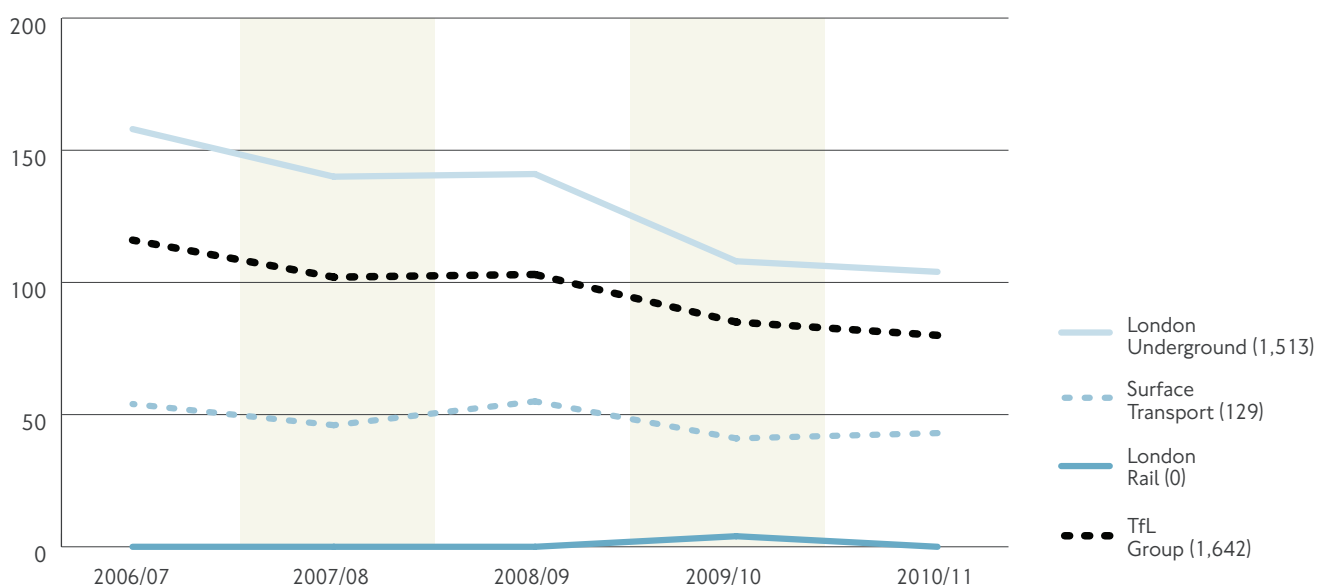
Employee assaults include any incident in which a person is verbally or physically abused, threatened or assaulted in circumstances related

to their work. For London Underground only, this includes employees who are travelling to and from work in uniform. Figure 5 illustrates the employee assaults within the operational customer facing businesses.

Over the past five years, TfL has seen a downward trend in the employee assault rate.

In London Underground there was a 21.6 per cent decrease in employee assaults from 1,932 in 2009/10 to 1,513 in 2010/11. London Underground introduced a revised work-related violence action plan that targeted immediate enforcement action for incidents and enhanced communications to the public. These actions were contributory factors to this year's reduction in employee assaults.

Figure 5: Employee assault rate (per 1,000 employees)



In Surface Transport, there was an 11 per cent decrease in employee assaults from 145 in 2009/10 to 129 in 2010/11. Targeted conflict avoidance and incident training of employees and enforcement measures by the workplace violence unit have helped to reduce assaults on employees.

There were no employee assaults in London Rail.

Customer safety

TfL provided more services than ever before in 2010/11 with some 3.5 billion customer journeys made. TfL recognises its customer safety responsibilities and continually seeks improvements to its operations to reduce accidents and injuries.

Customer accidental fatalities

This performance indicator is a measure of the number of customer fatalities arising from incidents involving a TfL business operation. Suicides, crime-related and medical fatalities are excluded.

The definition of customers includes members of the public using a TfL business or premises, including people using rights of way, tenants and off-duty employees.

There were no customer accidental fatalities in 2010/11; last year there were five.

Customer accidental fatalities

	2006/07	2007/08	2008/09	2009/10	2010/11
London Underground	2	0	0	1	0
Surface Transport	3	4	2	4	0
London Rail	0	0	0	0	0
TfL Group	5	4	2	5	0

Customer major injuries

Customer major injuries are those that result in the customer being taken to hospital following an incident that involves a TfL business operation.

Over the past five years, there has been a downward trend in the customer major injury rate for TfL. The customer major injury rate in 2010/11 was 0.28 per million customer journeys (see figure 6). This rate is monitored to enable the introduction of appropriate safety measures.

London Underground's customer major injuries increased by 12 per cent, from 111 in 2009/10 to 127 in 2010/11.

Surface Transport's customer major injuries increased by eight per cent, from 790 in 2009/10 to 861 in 2010/11. In London Rail, customer major injuries decreased by 27 per cent, from 11 in 2009/10 to eight in 2010/11.

Contractor safety

The contractor incident data in this section is not normalised. As the numbers of contractors tend to fluctuate on large projects, this makes actual data difficult to compare. Plans are under way to report normalised contractor safety data throughout TfL in future.

Contractor fatalities

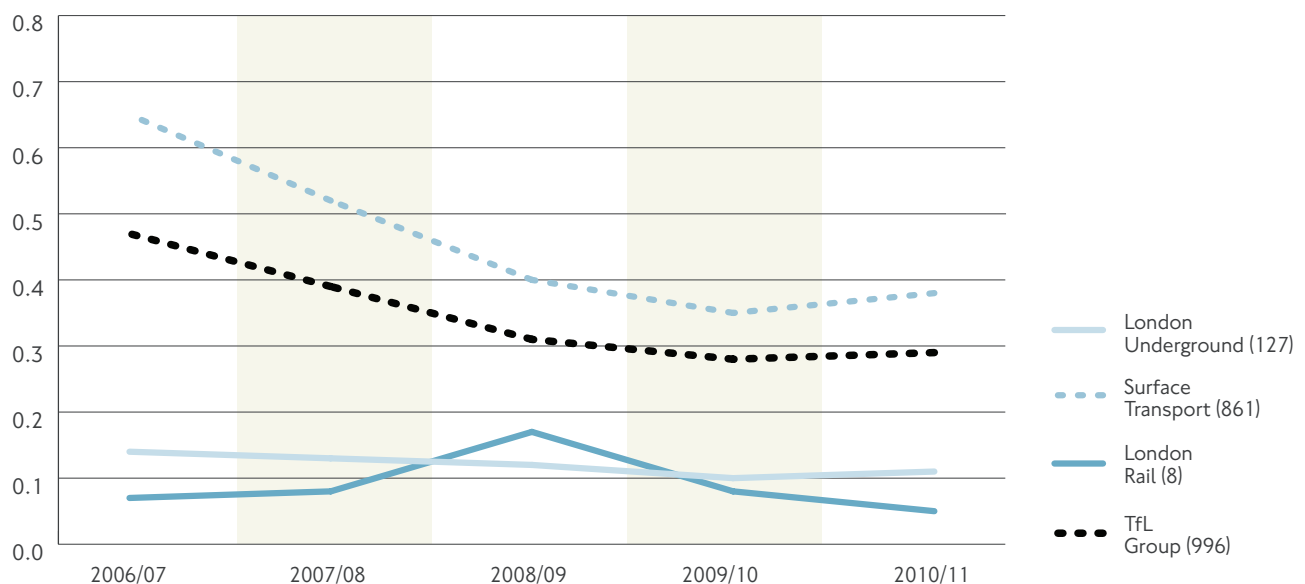
There was one contractor fatality in 2010/11. In Surface Transport, a bus contractor engineer was fatally injured while attending to a mechanical fault at the roadside.

Contractor major injuries

	2006/07	2007/08	2008/09	2009/10	2010/11
London Underground	10	13	24	20	4
Surface Transport	106	149	105	87	116
London Rail	3	10	4	0	4
Crossrail	-	-	1	2	0
Corporate Directorates	3	1	0	1	0

The contractor major injury data has not varied greatly in any of the businesses until 2010/11 when London Underground's contractor major injuries decreased from 20 in 2009/10, to four. This reduction was, at least in part, the result of contractors joining TfL.

Figure 6: Customer major injury rate (per million customer journeys)



Surface Transport's contractor major injuries increased from 87 in 2009/10 to 116 in 2010/11. All the contractor major injuries in Surface Transport involved bus drivers.

In London Rail, contractor major injuries increased from zero in 2009/10 to four in 2010/11.

Contractor assaults

	2006/07	2007/08	2008/09	2009/10	2010/11
London Underground	12	24	15	58	35
Surface Transport	708	1,168	888	618	1,288
London Rail	88	41	217	188	339
Crossrail	-	-	0	0	0
Corporate Directorates	0	0	0	0	0

London Underground's contractor assaults decreased from 58 in 2009/10 to 35 in 2010/11.

Of the 1,288 assaults in Surface Transport, 1,277 were against bus drivers. This is equivalent to 54 incidents per 1,000 contractors. Instances of verbal abuse contribute significantly to this figure.

In London Rail, contractor assaults increased from 188 in 2009/10 to 339 in 2010/11, largely because of an increased number of contractors during the year. The vast majority of the assaults were verbal assaults.

Crossrail and Corporate directorates had no contractor assaults this year.

Major incidents

Incidents that are classified as major incidents are:

- Fatality to employee, contractor, transport user or member of the public on TfL property or premises (excluding suicide or suspected suicide, crime-related fatality or non-work-related medical fatality)
- Incidents resulting in three or more people requiring treatment in hospital due to accidental injury
- Significant incidents where the final total costs are (likely to be) more than £1m to TfL, including those covered by insurance
- Incidents where prosecution is likely, there is a regulatory interest, or there is (or likely to be) significant media interest

TfL specifically excludes public road traffic accidents (RTAs) from this classification as they are not within TfL's directly managed activities. However, TfL remains responsible for collating and reporting on RTAs and instigating, where appropriate, action to improve road safety.

There were four major incidents in TfL in 2010/11 described below. Last year there were five major incidents reported.

Major incidents involving fatalities

- In September 2010, a bus contractor engineer was fatally injured while attending to a bus mechanical fault at the roadside. The incident is under investigation by the Health and Safety Executive

Major incidents not involving fatalities

- In August 2010, during the recovery of a failed rail grinder unit, the coupling between the unit and the assisting train failed. The unit rolled from Highgate on the Northern line to Warren Street station where it was stopped. No injuries were sustained. The incident remains under investigation by the Rail Accident Investigation Branch
- In November 2010, London Underground was fined £5,000 following an ORR prosecution. The prosecution was due to an incident in November 2009 in which customers were injured by a damaged inter-car barrier at Mile End station
- In December 2010, London Underground was fined £7,000 following an ORR prosecution. The prosecution was due to incidents between May and October 2009 in which customers were injured by falls at Cannon Street station

Road safety

In March 2000, the Government announced a national road safety strategy and casualty reduction targets for 2010. In 2006, London set more stringent targets as a result of good progress made. Targets were set against the 1994–1998 average casualties numbers.

By the end of 2010, four of the six targets had been met and good progress made in the other two.

Casualty category	2010 Target reduction against 1994–98 average (%)	Achieved reduction by December 2010 (%)
Total killed and seriously injured (KSI)	50	57
Pedal cyclist (KSI)	50	18
Pedestrian (KSI)	50	57
Powered two-wheeler rider and passenger (KSI)	40	34
Child (KSI)	60	73
Slightly injured casualty rate, expressed as the number of people slightly injured per 100 million vehicle kilometres	25	33

The graphs in this section give more details of type of injury by road user, for Greater London as a whole and for the TLRN.

During 2010/11, work started on preparing a new Road Safety Plan for London, which will set out a road safety strategy and delivery plan for the next 10 years.

TfL implemented road safety programmes to reduce further casualties in vulnerable road user groups. Activities included monitoring and research, education, training and publicity as well as road safety engineering.

Monitoring and research

During 2010/11, TfL supported road safety professionals in London to achieve casualty reduction targets by undertaking and commissioning research. Two research projects focusing on pedestrian and motorcycle fatalities were commissioned.

Education, training and publicity

In 2010/11, publicity material was distributed to parked bicycles as part of the heavy goods vehicles/pedal cycles 'Undertaking at junctions can be fatal' campaign. In addition, short films portraying a collision between a cyclist and a goods vehicle were shown in the new Certificate of Professional Competence freight driver training to help educate lorry drivers.

Road safety engineering

TfL is responsible for operating and improving conditions for all users of the TLRN, which is made up of approximately five per cent of London's roads but carries 33 per cent of its traffic. In 2010/11, TfL set up a road safety engineering programme with 120 schemes at

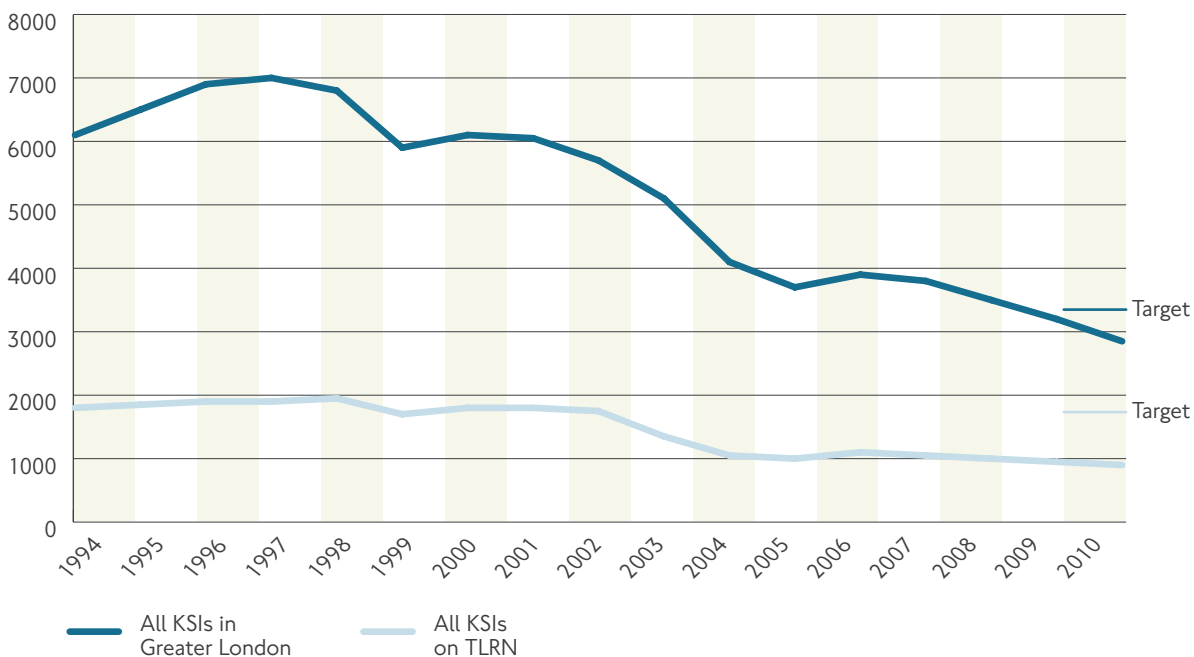
locations on the TLRN with high collision levels. TfL also identified 13 'Biking Boroughs' to create cycle hubs and safer cycling environments in Outer London.

All KSIs and slightly injured casualties for Greater London and TLRN

In 2010, fatalities decreased by 32 per cent when compared with 2009, from 184 to 126. Serious injuries decreased by nine per cent while slight injuries increased by five per cent. The total number of casualties increased by three per cent between 2009 and 2010.

Figure 7 shows trends in KSI casualties in Greater London and on the TLRN since 1994.

Figure 7: Greater London and TLRN all KSIs



There was an 11 per cent decrease in KSI casualties among all road users within Greater London during 2010. There was a three per cent decrease in the number of KSIs on the TLRN during 2010.

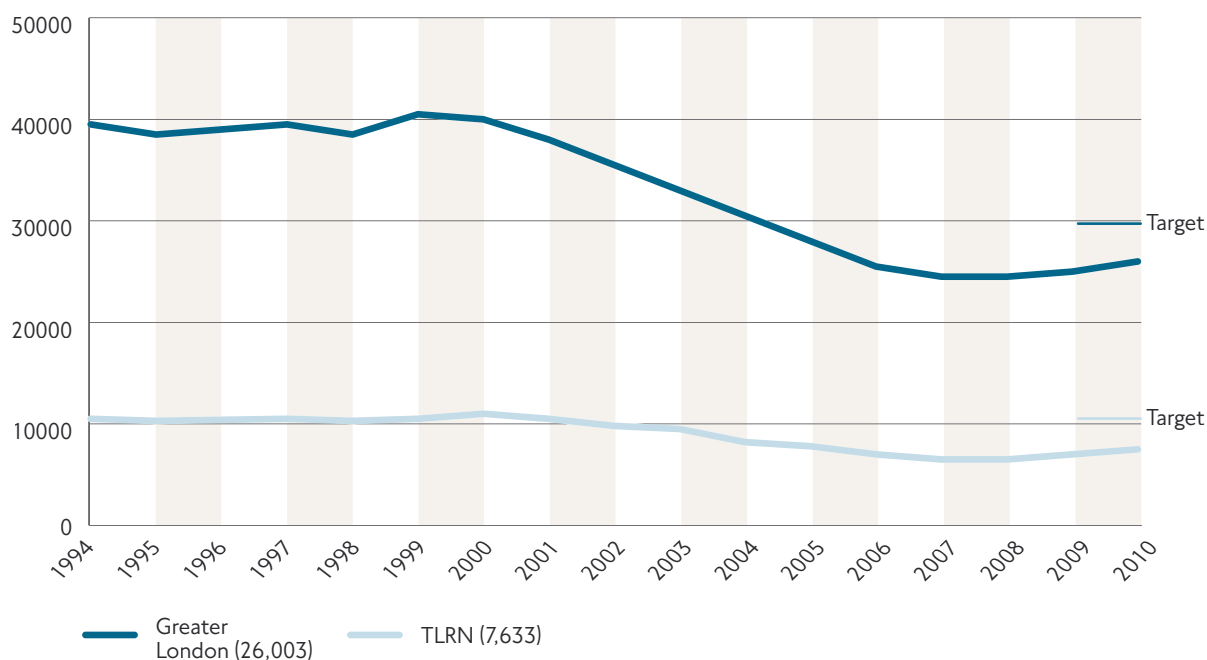
Figure 8 shows the trend in slight casualties within Greater London and on the TLRN since 1994. In Greater London, all slightly injured casualties increased by five per cent in 2010. The trend in slight casualties on the TLRN mirrors that of Greater London as a whole, with an increase of six per cent in all slight casualties in 2010.

Greater London KSI trends for vulnerable road users

Figure 9 shows the trend in KSI casualties among vulnerable road user groups in Greater London since 1994.

Pedestrians accounted for 46 per cent of all fatalities and 32 per cent of all serious injuries in 2010. Overall, pedestrian casualties increased by three per cent compared with 2009. Within this figure, pedestrian fatalities decreased by 34 per cent, from 88 to 58, serious injuries decreased by 12 per cent and slight injuries increased by eight per cent.

Figure 8: Greater London and TLRN – all slightly injured casualties

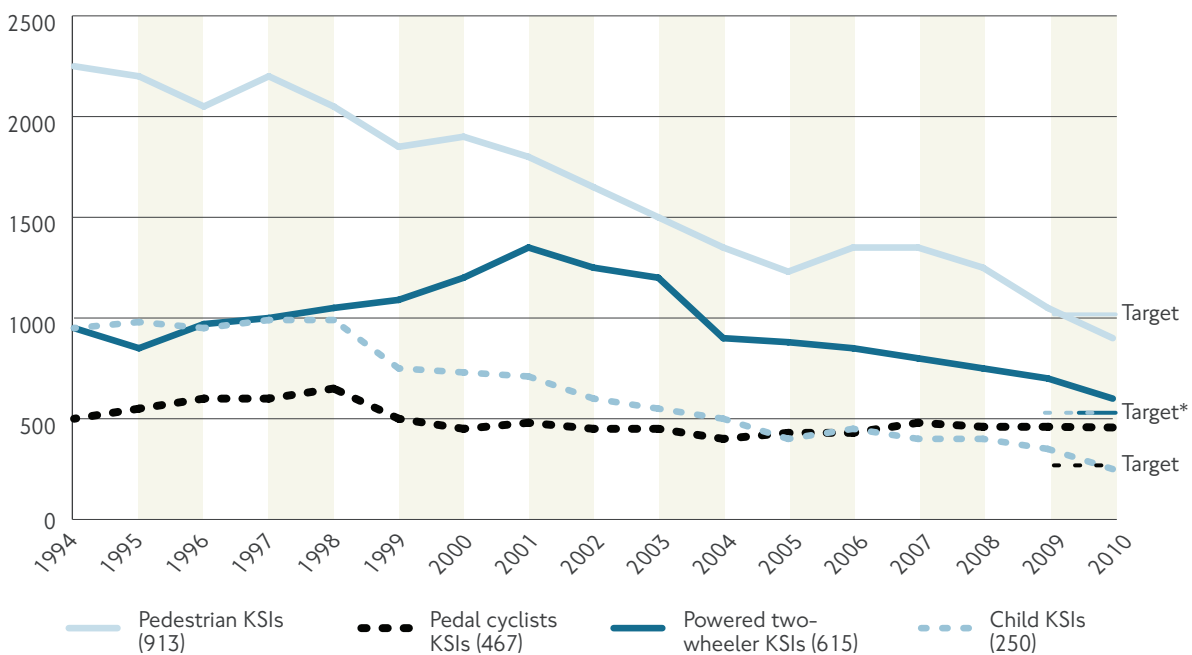


In 2010, pedal cyclists accounted for eight per cent of all fatalities and 16 per cent of all serious injuries. Casualties increased overall by nine per cent compared with 2009. Within this, the number of fatalities fell from 13 in 2009 to 10 in 2010. Serious injuries increased by nine per cent and slight injuries increased by nine per cent.

In 2010, riders and passengers of powered two-wheelers (P2W) accounted for 22 per cent of all fatalities and 21 per cent of all serious injuries. P2W casualties decreased by four per cent over 2009 levels, and fatalities decreased by 28 per cent.

In 2010, all child KSIs reduced by five per cent from 263 in 2009 to 250.

Figure 9: Greater London – KSIs among vulnerable road user groups



* All targets shown are for 2010. Powered two-wheeler KSIs and Child KSIs have the same target.

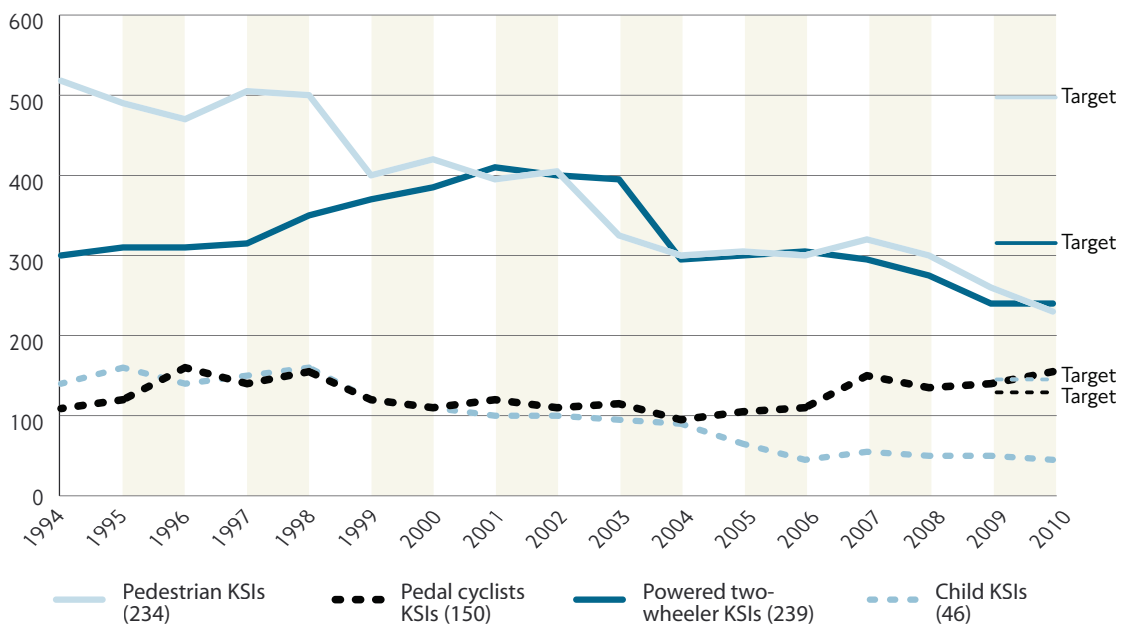
TLRN KSI trends for vulnerable road users

Figure 10 shows the trend in KSI casualties among vulnerable road user groups on the TLRN since 1994.

There was a decrease of eight per cent of all child KSIs and a decrease of 0.4 per cent of P2Ws KSIs in 2010.

Pedestrian KSIs on the TLRN decreased by seven per cent in 2010 but there was an increase of 10 per cent in pedal cycle KSIs.

Figure 10: TLRN – KSIs among vulnerable road user groups

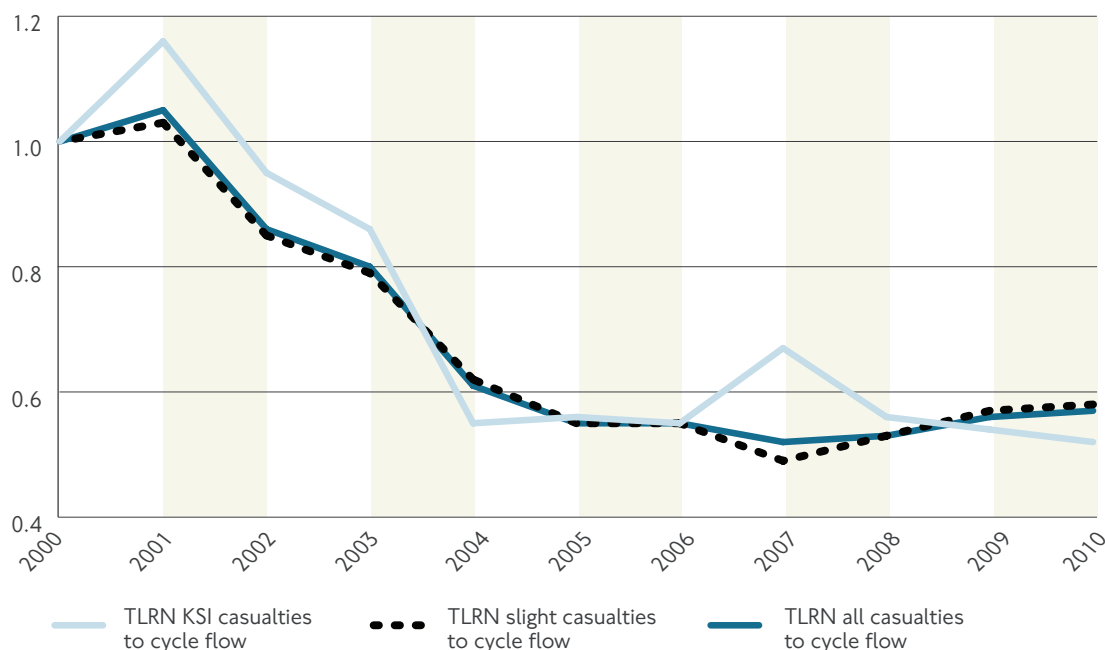


Since 2000, TfL has provided a reliable measure of cycling activity on the TLRN. Cycle flow is measured by cycle counters located across the TLRN based on a randomly stratified sample.

Figure 11 shows the trend in the estimated pedal cycle casualty rate on the TLRN since 2000. All casualties have been normalised by the cycle flows and are shown as indices, with the year 2000 set as 1.00, to estimate changes in the pedal cycle casualty rate.

By 2010, the pedal cycle casualty rate had fallen by more than 40 per cent compared with 2000, for each of the severity levels (all, KSI and slight casualties). It should be noted that there is more year-to-year fluctuation in the KSI casualty rate due to the relatively smaller numbers compared with the slight and all TLRN casualty rates, and that the fall in casualty rates on the TLRN has slowed since 2004.

Figure 11: Index of cyclist casualties to cycle flow on the TLRN



Reducing carbon emissions

A major challenge facing TfL is how to reduce its total CO₂ emissions while increasing service capacity. Investment in London's public transport system will result in a 30 per cent increase in capacity over the next decade. Boosting the efficiency of TfL's operations will be essential if CO₂ emissions are to be minimised.

Normalised CO₂ emissions reduction

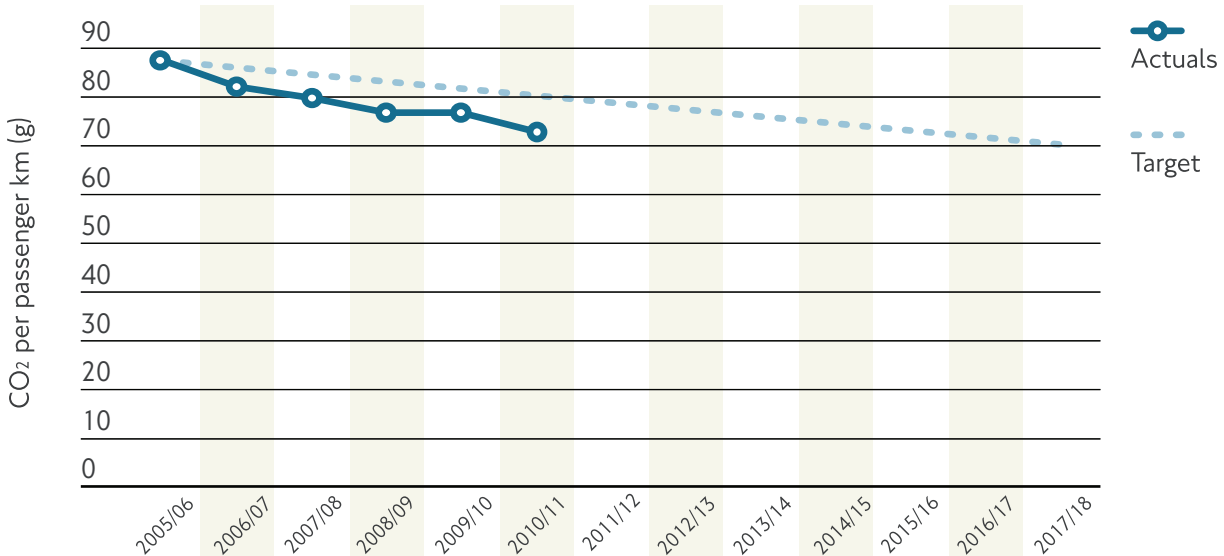
TfL has set a target to reduce the normalised emissions (measured in grams CO₂ per passenger km) from its main public transport services by 20 per cent in 2017/18, against a 2005/06 baseline. These are emissions associated with the London

Underground, buses, Docklands Light Railway, the Overground and Tramlink. At present, emissions from taxis and PHVs cannot be normalised with sufficient accuracy to be included in the target.

In 2010/11, all of TfL's public transport services experienced a fall in normalised emissions. They now emit 74 grams CO₂ per passenger km on average, which is four per cent below 2009/10 levels and 16 per cent below the baseline (see figures 12 and 13).

Figure 12: CO₂ target for a 20 per cent reduction in normalised emissions from TfL's public transports services

Includes emissions from LU, buses, DLR, Overground and Tramlink



Due to the scale of their operations, buses and London Underground remain the main contributors to TfL's performance.

- **Buses**

In 2010/11, normalised CO₂ emissions reduced by three per cent to 78 grams of CO₂ per passenger km. This was achieved through a combination of eco-driver training and new Euro V double-decker buses, which emit approximately four per cent less CO₂ than the older Euro II buses they replaced.

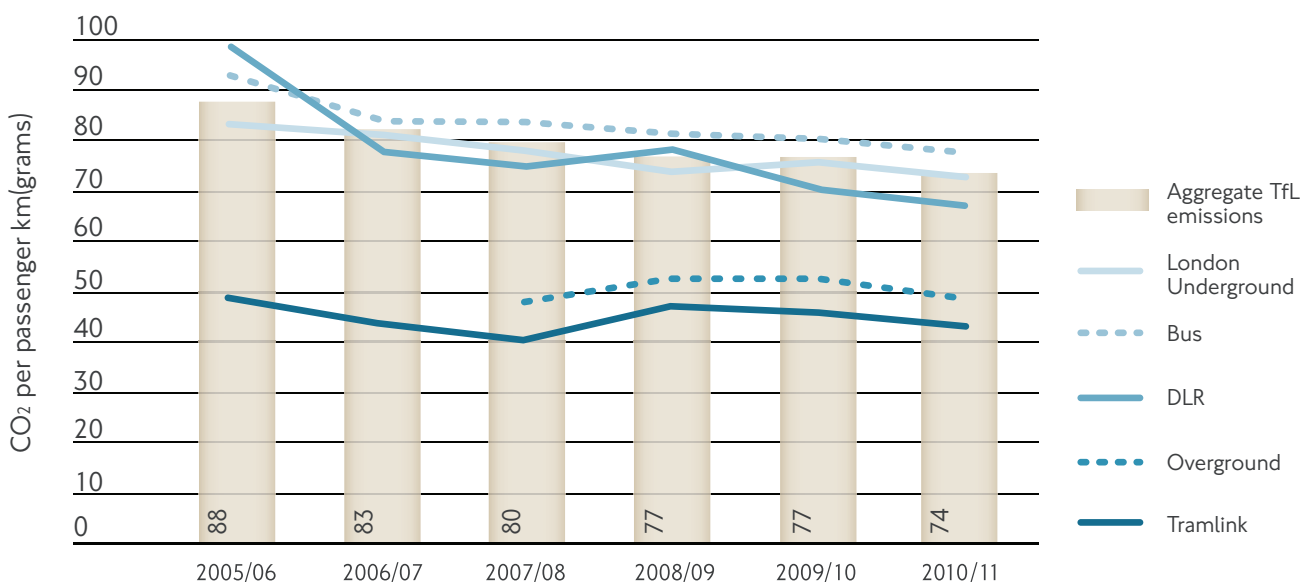
- **London Underground**

The Tube carried 42 million more passengers in 2010/11, a rise of five per cent compared to the previous year. The combination of increased passenger journeys and investment in energy-saving schemes, such as regenerative braking, reduced normalised emissions by five per cent to 72 grams CO₂ per passenger km.

- **Overground**

The extension of the East London line between Dalston Junction and West Croydon provides a third more service capacity, helping to increase passenger numbers and reduce normalised emissions by eight per cent to 49 grams CO₂ per passenger km.

Figure 13: Normalised emissions of CO₂ by mode of public transport



- **Docklands Light Railway**

Normalised emissions fell by four per cent in 2010/11 to 68 grams CO₂ per passenger km as the three-car service launched on the Bank-Lewisham route and between Stratford and Lewisham caused a rise in passenger journeys on the network.

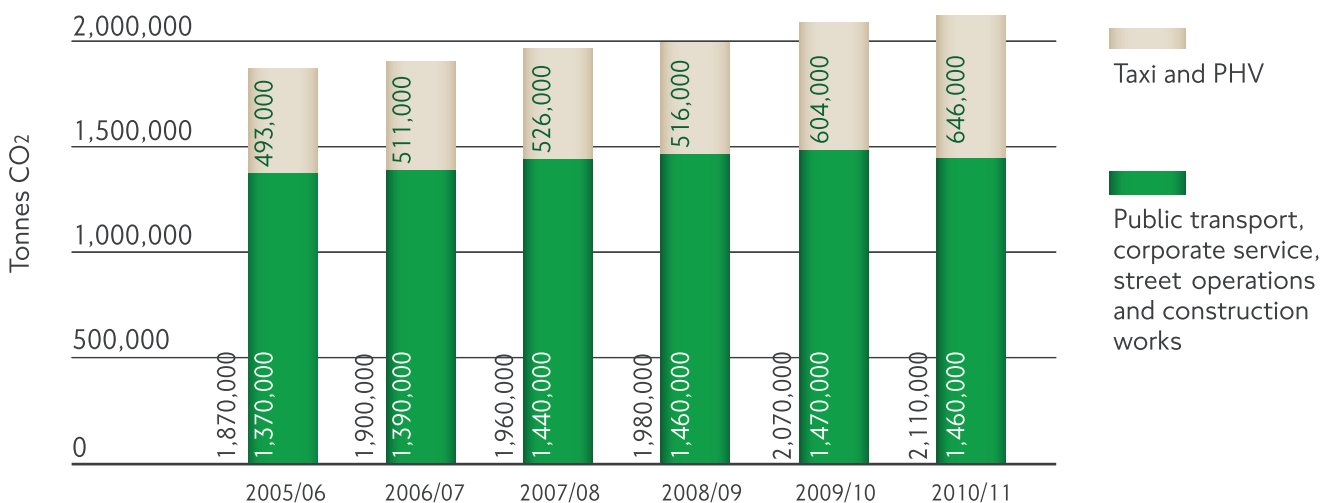
- **Tramlink**

Tramlink operated the same level of service as last year but a five per cent rise in passenger journeys caused normalised emissions to fall by the same amount to 43 grams CO₂ per passenger km in 2010/11.

Absolute CO₂ emissions

TfL has direct control over the emissions from its main public transport services, the maintenance and operation of the TLRN, the energy consumption of traffic lights in London, construction works and head offices. In 2010/11, TfL recorded 1,460,000 tonnes of CO₂ emissions from these sources, with TfL's main public transport services accounting for 91 per cent of the total (1,340,000 tonnes of CO₂). Despite operating more public transport services and construction works over the year, absolute emissions from TfL's direct operations were one per cent down on the previous year.

Figure 14: Total CO₂ emissions from TfL operations



The remaining emissions associated with TfL's activities come from taxis and PHVs and in 2010/11 absolute CO₂ emissions from these sources were 646,000 tonnes. This is an increase of seven per cent on the previous year as 6,800 more vehicles joined the PHV fleet and the number of taxis increased by 1,180.

In figure 14, taxi and PHV emissions have been separated out from those associated with TfL's other operations. This is because they are from vehicles owned and operated by third parties. TfL exercises influence over taxi and PHV emissions through licensing arrangements (which state limits on Euro standards and vehicle age).

Overall, absolute CO₂ emissions associated with all of TfL's operations in 2010/11 were 2,110,000 tonnes, which reflects the gradual year-on-year upward trend.

Carbon reduction commitment energy efficiency scheme (CRC)

Energy used at TfL's stations, depots, highway structures, piers, head offices and buildings is within the scope of the Government's CRC scheme. In 2010/11, absolute CO₂ emissions from these sources were 149,000 tonnes.

Energy efficiency

Head office electricity efficiency improved by five per cent due to a number of energy efficiency initiatives including the installation of the CHP Fuel Cell at Palestra, RE:FIT efficiency works (in particular lighting and building fabric upgrades), a move to thin client computers and staff engagement campaigns.

Cold winter weather contributed to more gas being consumed in 2010/11, causing overall head office energy consumption to increase by one per cent to 322 kWh/m².

Improving air quality and noise

Air quality

TfL monitors the total amount of nitrogen oxides (NO_x) and particulate matter (PM₁₀) from its operations. These air pollutants largely arise from internal combustion engines in vehicles. They also arise from construction site dust and the wear of brake pads on vehicles, but as they are difficult to measure they are not included in the scope of the KPIs.

TfL controls the emissions associated with its main public transport services but has less control over the size of the taxi and PHV fleets as they are from vehicles owned by third parties. TfL exercises influence over taxi and PHV

emissions through licensing arrangements (which state limits on Euro standards and vehicle age). To reflect this, taxi and PHV NO_x and PM₁₀ emissions have been separated from those associated with TfL's public transport services in figures 16 and 18.

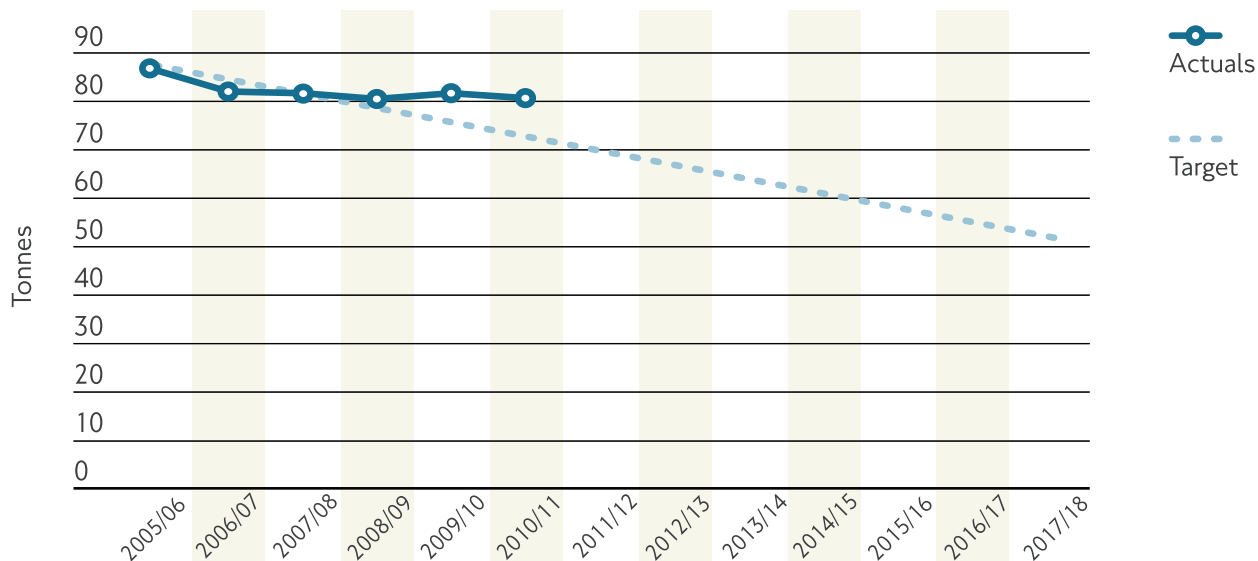
TfL will amend this report with air emissions data normalised by passenger kilometres in the coming months.

NO_x

TfL has set a target to achieve a 40 per cent reduction in total NO_x emissions by 2017/18 against 2005/06 levels. The target applies to

Figure 15: NO_x target of a 40 per cent reduction in total emissions from TfL's operations

Includes emissions from public transport services, taxis and PHVs



all TfL public transport services, including taxis and PHVs.

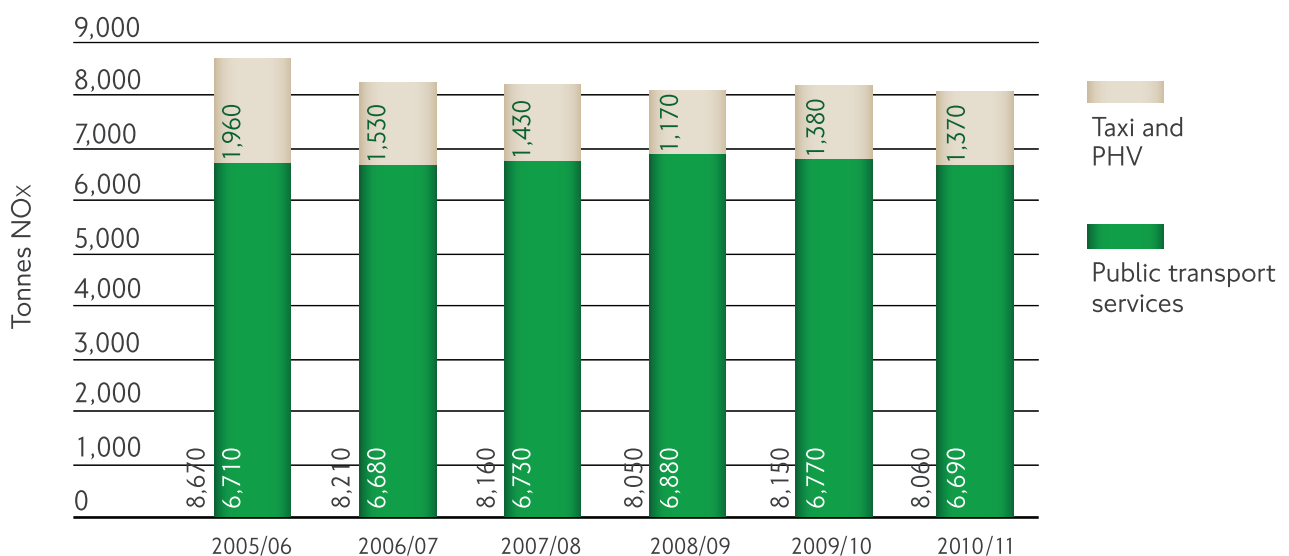
In total, TfL recorded 8,060 tonnes of NOx emissions from all its operations in 2010/11 which is one per cent down on the previous year. Performance in 2010/11 means that total emissions are seven per cent lower than the 2005/06 baseline total but they are still above the required trend line to achieve the 2017/18 target (see figure 15).

Buses accounted for 76 per cent of recorded TfL NOx emissions and, in 2010/11, total emissions from the bus fleet fell by one per

cent due to continued investment in cleaner vehicles. Euro V buses emit 19 per cent less NOx emissions than Euro II buses and, in 2010/11, approximately 700 Euro V and Enhanced Environmental friendly Vehicles (EEV)² entered the fleet.

The remaining emissions are principally associated with the taxi and PHV fleet, with total emissions split evenly between the two sources. Together they emitted 1,370 tonnes of NOx in 2010/11, which is similar to last year.

Figure 16: Total NOx emissions from TfL operations



² EEVs are vehicles over 3.5 tonnes that comply with the voluntary EEV standard, a more stringent standard than Euro V

PM₁₀

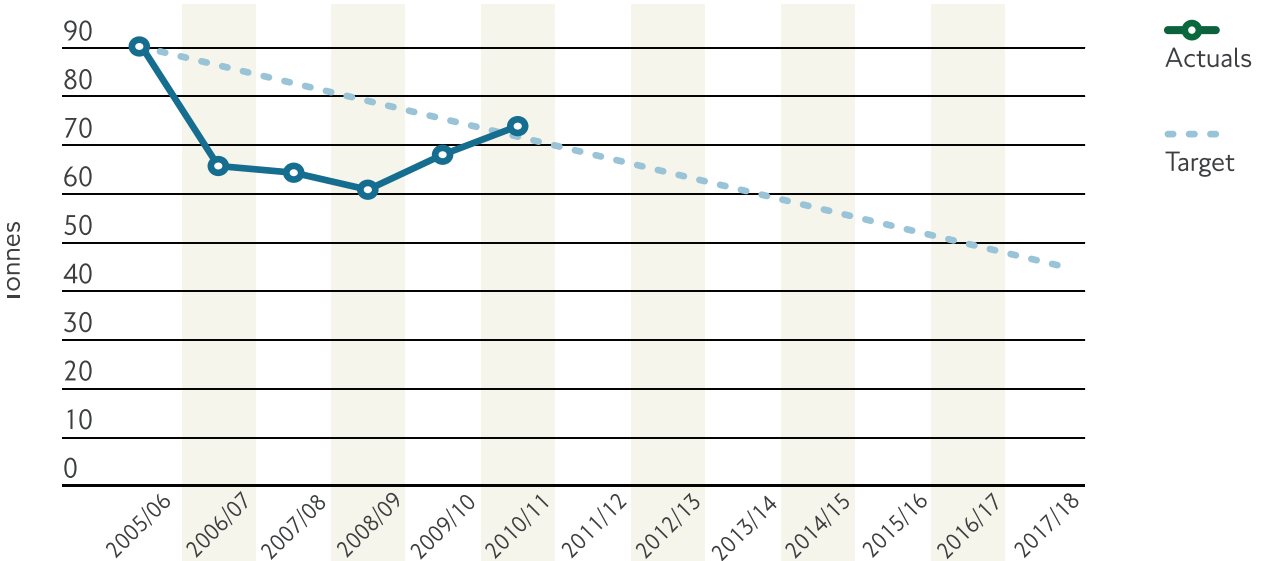
TfL has set a target to reduce total PM₁₀ emissions from its operations by 50 per cent in 2017/18 against 2005/06 levels. The target applies to TfL public transport services and the taxi and PHV fleet. Over the reporting year, TfL recorded 147 tonnes of PM₁₀ emissions from all its operations. Total emissions were up by eight per cent on the previous year but they remain 19 per cent lower than the 2005/06 baseline (see figure 17).

Taxis and PHVs accounted for 79 per cent of total TfL PM₁₀ emissions. Due to changes in the size of the taxi and PHV fleets, total emissions from these sources increased by eight per cent to 116 tonnes in 2010/11. Emissions from taxis account for around two thirds of the total.

TfL's public transport services emitted 31 tonnes of PM₁₀ in 2010/11. The absolute amount of PM₁₀ emitted from buses is now low due to the initiatives that have been introduced by TfL. By replacing the older, more polluting vehicles with cleaner ones, emissions of PM₁₀ from the bus

Figure 17: PM₁₀ target of a 50 per cent reduction in total emissions from TfL's operations

Includes emissions from Overground, taxis and PHVs, river services and buses

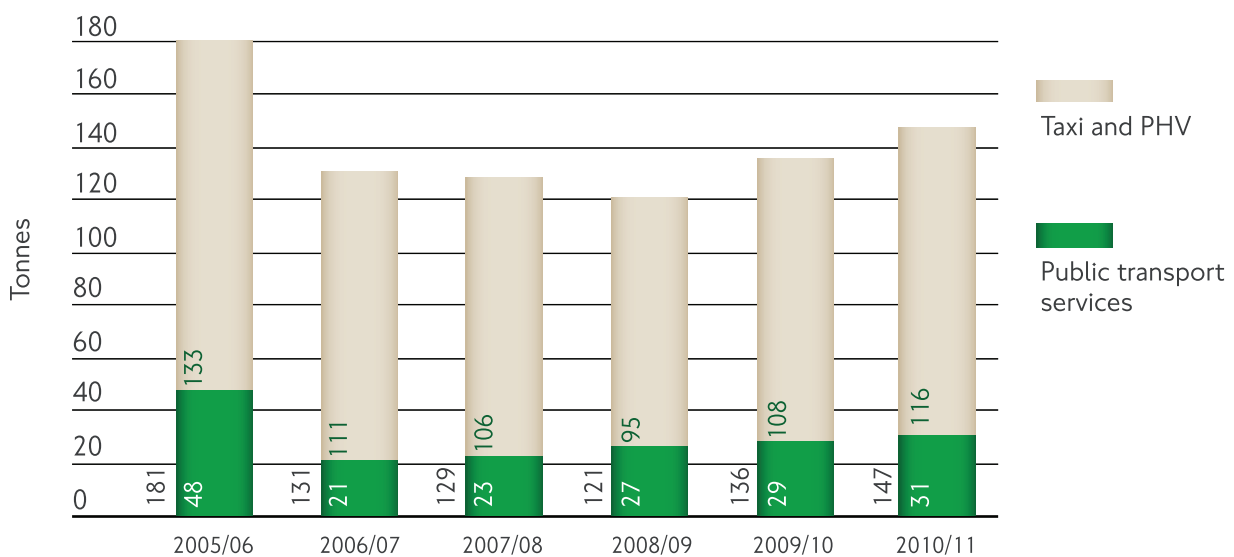


fleet have dropped from more than 200 tonnes in 1997 to 16 tonnes in 2010/11. Over the same period, the number of kilometres operated by London's buses increased by 42 per cent.

Buses are responsible for a relatively small proportion of TfL's absolute emissions (around 10 per cent) and while there was a small increase in PM₁₀ emissions from buses, this increase was less than one per cent of the total PM₁₀ emitted in 2010/11.

The remaining PM₁₀ emissions from TfL's public transport services are mainly associated with river services, which includes the TfL operated Woolwich Ferry and Thames Clippers and other scheduled services, which TfL does not operate. PM₁₀ emissions increased slightly as fuel use went up by 1.5 per cent due to additional Woolwich Ferry operations during Blackwall Tunnel closures and increased operation of Thames Clippers.

Figure 18: Total PM₁₀ emissions from TfL operations



Noise

Noise complaints rose by nearly half to 951 (from 643) compared with the previous year. More complaints (324) were received in 2010/11 about construction works associated with Crossrail and upgraded public address (PA) systems at a small number of new London Overground stations.

While noise complaints associated with asset noise, construction, contractor noise and PA announcements on the Underground remain the largest source of complaints, the number received (574) remained broadly consistent with that reported last year. Throughout the year London Underground improved its processes for the planning of works and resolving PA noise complaints to reduce this in the future.

TfL aims to reduce noise on the TLRN by using quieter noise surfaces. Around 74 per cent of the TLRN is now covered with quieter surfaces.

TfL requires that all new buses are two decibels quieter than the legal limit. The number of buses that are two decibels quieter than the required legal limit rose from 28 per cent last year to 37 per cent in 2010/11. As new vehicles come into the bus fleet, the proportion will rise.

Resource consumption and waste recycling

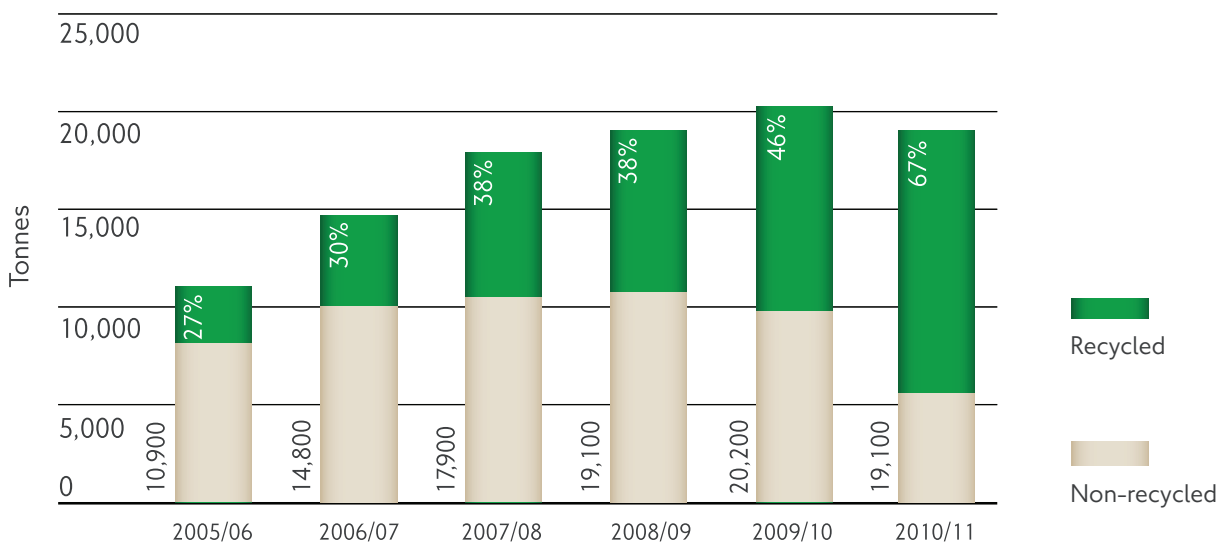
TfL's operations give rise to different types of waste including construction waste, litter left by passengers on public transport vehicles and waste from its offices. TfL has a duty to manage these wastes and use resources responsibly. TfL has taken great strides in this area in recent years, with more and more materials being recycled and there has been an increasing focus on reducing and reusing waste at source. Applying these principles to all the resources consumed helps to ensure that they are used efficiently and responsibly.

Commercial & Industrial (C&I) waste

Station, depot and office waste is classified as C&I waste. TfL has committed to increasing the recycling rate of C&I waste to 70 per cent by 2017/18.

In 2010/11, TfL collected 19,100 tonnes of waste at its stations, depots and buildings (see figure 19). As with previous years, litter left by passengers using London Underground's services and waste from their stations and depots accounted for the majority of TfL's C&I waste. Improvements in the way that London Underground handles this type of waste at some

Figure 19: Total annual station, depot and office waste from TfL operations



of its maintenance locations contributed to the five per cent drop in the total volume of C&I waste reported by TfL in 2010/11.

In 2010/11, TfL recycled 67 per cent of its C&I waste, narrowly missing its 2017/18 target. This was a significantly higher recycling rate than the 46 per cent achieved in 2009/10.

Most of London Underground's station and depot waste now goes to recycling centres, which separate these materials and send them for recycling. As a result, 74 per cent of London Underground's station and depot waste is now recycled – a significant improvement compared to the previous year (46 per cent).

TfL's network of environmental champions has been crucial in helping staff reduce TfL's impact on the environment at its head offices. By raising awareness of waste management issues and encouraging staff to use less, the total amount of waste produced at TfL's head offices fell by 13 per cent in 2010/11.

TfL recycled 70 per cent of the waste generated at its head office locations because of the implementation of bin sharing at key sites and the ongoing success of its recycling contract.

Construction and demolition (C&D) waste

TfL has set itself a target to reuse or recycle at least 90 per cent of C&D waste over the period to 2017/18 and to achieve 95 per cent by 2017/18.

A total of 331,000 tonnes of C&D waste was generated from construction sites, improvement works, maintenance activities and track replacement projects in 2010/11 (see figure 20).

The amount of this type of waste generated fluctuates over time depending on the programme of works scheduled during the reporting year. Total TfL C&D waste was 42 per cent lower in 2010/11 when compared with the previous year, as the extension of the East London line between Dalston Junction and West Croydon was completed ahead of schedule.

Waste associated with the construction of Crossrail increased significantly as enabling works continued, more demolition works were carried out and construction of the western tunnel portal at Royal Oak and the eastern tunnel portal at Pudding Mill Lane started. The total volume of C&D waste from capital programmes, ongoing maintenance renewal projects on the Tube and from TLRN maintenance increased slightly as works generating more waste were undertaken during the year.

TfL met its 2017/18 target by reusing or recycling 95 per cent of its C&D waste in 2010/11.

London Underground achieved a 92 per cent recycling rate for C&D waste from projects, including ballast track replacement and station capacity projects such as Tottenham Court Road. A 93 per cent recycling rate was achieved for decommissioned Victoria line trains ('67 stock).

Around 99 per cent of the C&D waste generated from the TLRN is either reused or recycled.

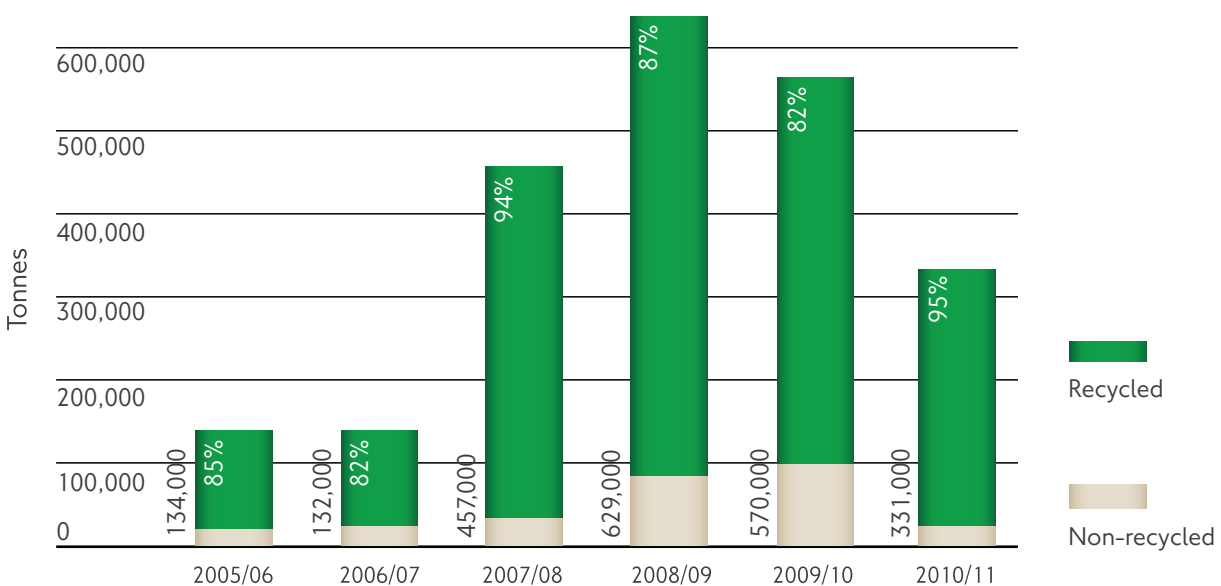
Crossrail recycled 96 per cent of its C&D waste in 2010/11, achieved in part by actively encouraging the reuse of waste on its sites. For example, 1,000 tonnes of material were reused to construct a haulage route linking the Royal Oak portal and Westbourne Park worksites.

practice guidelines issued by Defra (6.4m³ per person). The five per cent drop in 2010/11 was achieved by the implementation of various water saving projects, such as installing more water-efficient dual-flush toilets, which can reduce consumption by up to 50 per cent.

Water consumption

Water consumption is measured at head office buildings and in 2010/11 was 5.7 cubic metres per person, which is well below best

Figure 20: Total annual construction waste from TfL operations



Summary of TfL health, safety and environment KPIs

Health and safety

London Underground					
	2006/07	2007/08	2008/09	2009/10	2010/11
Customer injuries					
Fatal	2	0	0	1	0
Major	150	144	134	111	127
Customer journeys (millions)	1,014	1,072	1,089	1,065	1,107
Employee on-duty injuries – Injuries sustained as a result of physical assault are included					
Fatal	0	0	0	0	0
Major	8	23	7	8	15
Employee numbers	14,000	14,388	13,215	17,882	14,605
Contractor injuries					
Fatal	0	0	1	0	0
Major	10	13	24	20	4
Employee assaults					
Actual	2,024	1,881	1,857	1,932	1,513
Employee numbers	14,000	14,388	13,215	17,882	14,605
Contractor assaults					
Actual	12	24	15	58	35

Surface Transport					
	2006/07	2007/08	2008/09	2009/10	2010/11
Customer injuries					
Fatal	3	4	2	4	0
Major	1,238	1,169	908	790	861
Customer journeys (millions)	1,906	2,216	2,217	2,295	2,284
Employee on-duty injuries – Injuries sustained as a result of physical assault are included					
Fatal	0	0	0	0	0
Major	0	3	10	7	4
Employee numbers	4,577	4,632	4,228	3,545	3,008
Contractor injuries					
Fatal	0	1	1	0	1
Major	106	149	105	87	116
Employee assaults					
Actual	229	215	245	145	129
Employee numbers	4,577	4,632	4,228	3,545	3,008
Contractor assaults					
Actual	708	1,168	888	618	1,288

London Rail					
	2006/07	2007/08	2008/09	2009/10	2010/11
Customer injuries					
Fatal	0	0	0	0	0
Major	4	4	20	11	8
Customer journeys (millions)	61.0	66.6	199.0	130.0	167.3
Employee on-duty injuries – Injuries sustained as a result of physical assault are included					
Fatal	0	0	0	0	0
Major	0	0	0	1	0
Employee numbers	138	180	232	235	216
Contractor injuries					
Fatal	0	0	1	0	0
Major	3	10	4	0	4
Employee assaults					
Actual	0	0	0	1	0
Employee numbers	138	180	232	235	216
Contractor assaults					
Actual	88	41	217	188	339

Crossrail			
	2008/09	2009/10	2010/11
Employee injuries			
Fatal	0	0	0
Major	0	1	0
Employee numbers	294	326	290
Contractor injuries			
Fatal	0	0	0
Major	1	2	0

Corporate Directorates					
	2006/07	2007/08	2008/09	2009/10	2010/11
Employee injuries					
Fatal	0	0	0	0	0
Major	1	2	0	2	0
Employee numbers	2,011	2,336	2,177	2,417	2,461
Contractor injuries					
Fatal	0	0	0	0	0
Major	3	1	0	1	0

Average sickness absence per FTE by TfL business area (2006-2011)					
	2006/07	2007/08	2008/09	2009/10	2010/11
TfL	11.4	10.1	9.9	10.1	9.7
London Underground	12.5	10.5	10.2	10.2	10.2
Surface Transport	9.7	11.1	10.5	10.4	8.9
London Rail	4.2	2.7	4.5	4.7	3.2
Crossrail	-	-	4.6	5.4	6.8
Corporate Directorate	8.0	6.3	7.0	7.3	7.6

Average days lost due to sickness absence by TfL business area 2010/11						
	LU	ST	LR	CR	CD	TfL
Mental illness	1.45	1.29	0.82	0.94	1.54	1.43
Musculoskeletal	2.04	1.47	0.42	0.65	0.94	1.83
Cold/flu	1.49	1.26	0.45	1.72	1.34	1.43
Gastrointestinal	1.09	1.08	0.50	0.91	0.83	1.06
Accidents/injury	1.10	0.66	0.14	0.04	0.48	0.96
Other	0.91	0.64	0.0	0.65	0.39	0.81
Neurological	0.52	0.57	0.14	0.38	0.52	0.52
Respiratory	0.35	0.35	0.15	0.22	0.29	0.34
Hypertension/stroke	0.38	0.40	0.02	0.38	0.16	0.35

Road safety casualty data

Casualty severity	User group	Casualty numbers		Percentage change in 2010 over 2009
		2009	2010	
Fatal	Pedestrians	88	58	-34
	Pedal cyclists	13	10	-23
	Powered two-wheeler	39	28	-28
	Car occupants	41	27	-34
	Bus or coach occupants	3	0	-100
	Other vehicle occupants	0	3	-
	Total	184	126	-32
Fatal and serious	Pedestrians	1,055	913	-13
	Pedal cyclists	433	467	8
	Powered two-wheeler	706	615	-13
	Car occupants	818	722	-12
	Bus or coach occupants	124	98	-21
	Other vehicle occupants	91	71	-22
	Total	3,227	2,886	-11
	Child pedestrians	174	189	9
	Child pedal cyclists	39	22	-44
	Child car passengers	34	31	-9
	Child bus / coach passengers	6	5	-17
	Other child casualties	10	3	-70
	Children (under 16 yrs)	263	250	-5
	Slight	Pedestrians	4,154	4,478
Pedal cyclists		3,236	3,540	9
Powered two-wheeler		3,795	3,722	-2
Car occupants		11,230	11,851	6
Bus or coach occupants		1,319	1,303	-1
Other vehicle occupants		1,018	1,109	9
Total		24,752	26,003	5
All severities	Pedestrians	5,209	5,391	3
	Pedal cyclists	3,669	4,007	9
	Powered two-wheeler	4,501	4,337	-4
	Car occupants	12,048	12,573	4
	Bus or coach occupants	1,443	1,401	-3
	Other vehicle occupants	1,109	1,180	6
	Total	27,979	28,889	3

NB: Green shaded areas show the National and London casualty reduction target categories

The Mayor's target is for a 25 per cent reduction in the slight casualty rate per 100 million vehicle km. Until guidance is received from the Department for Transport on how this should be measured, slight casualties are shown as casualty numbers rather than a casualty rate.

Environment						
	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11
Carbon dioxide emissions						
Total CO ₂ emissions (tonnes)	1,870,000	1,900,000	1,960,000	1,980,000	2,070,000	2,110,000
CO ₂ emissions from TfL's main public transport modes (grams per passenger km):						
TfL's Public Transport Operations (average)	88	83	80	77	77	74
London Underground	83	82	78	74	76	72
London Bus Services	93	84	84	82	81	78
Docklands Light Railway	99	78	75	78	70	68
Tramlink	49	44	40	47	46	43
Overground	-	-	48	53	53	49
Energy consumption in head office buildings (kWh/m ²)	413	357	317	314	319	322
Air pollutant emissions						
Total PM ₁₀ emissions (tonnes)	181	131	129	121	136	147
Total NO _x emissions (tonnes)	8,670	8,210	8,160	8,050	8,150	8,060
Transport related noise and vibration						
Number of noise complaints received	479	458	529	411	643	951
Percentage of TLRN with lower noise surface material	70	70	70	70	74	74
Percentage of buses in fleet at least 2dB(A) quieter than the required legal limit	0	4	8	14	28	37
Waste generated by TfL activities by applying the principles of reduce, reuse and recycle						
Total C&I waste (tonnes)	10,900	14,800	17,900	19,100	20,200	19,100
Proportion of C&I waste recycled (%)	27	30	38	38	46	67
Total C&D waste (tonnes)	134,000	132,000	457,000	629,000	570,000	331,000
Proportion of C&D waste recycled (%)	85	82	94	87	82	95
Water consumed per occupant in head office buildings (m ³ per person)	11.3	9.4	7.7	6.5	6.0	5.7

TfL welcomes your views to help improve its HSE performance, including feedback on this report.

Please send your comments to:

Customer Relations

Transport for London
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14 Pier Walk
North Greenwich
London
SE10 0ES

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September 2011

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Subject: Summary List of Actions

Report to: Health and Environment Committee

Report of: Executive Director of Secretariat

Date: 12 September 2012

This report will be considered in public

1. Summary

1.1 This report sets out the actions arising from previous meetings of the Committee.

2. Recommendation

2.1 **That the Committee notes the outstanding actions arising from the previous meeting of the Committee, as listed below.**

Meeting of 12 June 2012

Minute item	Subject and action required	Status	For Action
Item 6.	<p>Water Management in London</p> <ul style="list-style-type: none"> During the course of the discussion, the Committee noted that they would be given in writing additional information from Thames Water and Veolia Water. Copies of the letters from the Chair to Thames Water and Veolia Water are attached as Appendix 1 and Appendix 2 to this report. 	<p>In progress.</p> <p>Following the meeting Thames Water wrote providing the following answer:</p> <p>1) Please find attached a copy of our recent letter to Anne McIntosh addressing the GMB's claims about the sale of reservoir sites (attached as Appendix 1a)</p> <p>2) The Committee asked about the inspection regime for the trunk sewer that runs through Sloane Square Tube Station. We regularly inspect our assets that run through the London Underground and this particular structure was fully inspected and surveyed in 2002. We will be conducting a further survey in the coming months. We fitted a kevlar and stainless steel liner to the sewer in the 1980's which</p>	Thames Water and Veolia Water.

Minute item	Subject and action required	Status	For Action
		<p>significantly reduces the risk of a disruptive burst.</p> <p>In addition to our own inspections, London Underground inspects any infrastructure, including pipework that intersects with their assets, on a daily basis, and reports faults directly to us.</p> <p>3) The Committee also asked questions about how the cost of water is divided:</p> <p>OFWAT define bills as consisting of the following three components:</p> <ul style="list-style-type: none"> • Operating costs – the day-to-day costs of running the business. • Capital charges – the costs of improving and maintaining companies’ assets, such as treatment works, spread over the life of the assets. • The return on capital – interest payments, profit (including dividends) and tax. <p>In their report ' Future Water and Sewerage Charges' 2010-15 OFWAT summarises how the average UK water bill covers these areas:</p>	
	<ul style="list-style-type: none"> • The Committee agreed to write to OFWAT on a number of issues that were raised during the discussion. A copy of the letter from the Chair to Ofwat is attached as Appendix 3. 	<p>A copy of OFWAT’s response is attached as Appendix 3a. Also attached as Appendix 3b is a report that describes OFWAT’s approach to setting price limits for the water and sewage companies in England and Wales for the five years 2010 -2015.</p>	

Meeting of 3 July 2012

Minute item	Subject and action required	Status	For Action
Item 6.	<ul style="list-style-type: none"> During the course of the discussion, the Committee noted that they would be given in writing additional information from the Mayor's Advisor for Environment and Political Affairs, Greater London Authority, and the Head of London Wide Policy & Strategy Planning, Transport for London (TfL). Copies of the letters sent to the Mayor's Advisor and TfL are attached as Appendix 4 and Appendix 5 to this report. 	In progress.	Mayor's Advisor and the Head of London Wide Policy & Strategy Planning, (TfL)

List of appendices to this report:

Appendix 1 – Letter to Thames Water dated 12 June 2012 from Murad Qureshi AM, Chair of the Health and Environment Committee;

Appendix 1a – Copy of letter to Anne McIntosh MP from Richard Aylard CVO, Thames Water.

Appendix 2 – Letter to Veolia Water dated 6 June 2012 from Murad Qureshi AM, Chair of the Health and Environment Committee;

Appendix 3 – Letter to OFWAT dated 6 July 2012 from Murad Qureshi AM, Chair of the Health and Environment Committee;

Appendix 3a – Letter to Murad Qureshi AM, Chair of the Health and Environment Committee dated 3 August 2012 from OFWAT;

Appendix 3b – OFWAT's future and sewerage charges 2010 –15: Final determinations report.

Appendix 4 – Letter to the Mayor's Environment Advisor dated 6 July 2012 from Murad Qureshi AM, Chair of the Health and Environment Committee; and

Appendix 5 – Letter to TfL from Murad Qureshi AM, Chair of the Health and Environment Committee.

Local Government (Access to Information) Act 1985	
List of Background Papers: Minutes of the Committee meetings on 12 June 2012, and 3 July 2012	
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Richard Aylard
External Affairs and Sustainability Director
Thames Water
Clearwater Court
Vastern Road
Reading
Berkshire
RG1 8DB

6 July 2011

Dear *Richard,*

Health and Environment Committee Meeting – 12 June 2012

Thank you very much for your contributions at the London Assembly's Health and Environment Committee meeting on 12 June. You will recall that, during the meeting, we agreed you would provide further information on a couple of issues. I would appreciate it if you could therefore provide the following written information:

- How Thames Water assesses the cost of the water it provides, including how this is composed of various factors including extraction, treatment, movement and storage. How infrastructure costs are reflected. How social and environmental costs and other externalities are reflected. Details of any shadow pricing or similar methodology used;
- How Thames Water determines the price it charges to consumers;
- further information on your approach to the economics of leakages, specifically your approach to prioritising this work over other water supply and demand measures;
- How Thames Water considers it can be of assistance to water companies operating within London that are not yet in the position to withdraw their restrictions on water use; and
- A copy of the letter written to Anne McIntosh MP, Chair of the House of Commons Environment Food and Rural Affairs Select Committee, regarding the sale of reservoirs.

Thank you for agreeing to provide further written responses as well as attending the Committee's meeting. If you are able to respond by the end of July, the Committee would be grateful. If you can copy your response electronically to ian.williamson@london.gov.uk, that would be very helpful.

For your reference I attach a copy of the transcript of the discussion.

Yours sincerely,



Murad Qureshi AM
Chair of the Health and Environment Committee

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Ms Anne McIntosh MP
Chair, Environment, Food & Rural Affairs
Select Committee
House of Commons
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SW1A 0AA

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22 May 2012

Dear Anne

As I am sure you are aware, GMB, the union which represents some workers in the water industry, called on the EFRA Committee earlier this month to investigate the closure of water storage sites in the south east. The union argued that these closures “leave rainfall running off to the sea while the region is subject to drought orders”. (I have enclosed the full GMB press release as an appendix).

Building on our immediate response to media enquiries which we provided your office on the day of the GMB’s statement, I wanted to give you a detailed rebuttal.

The current water shortage and Temporary Use Ban follow the driest two-year period on record, which has left groundwater sources in parts of our region at their lowest ever levels. The recent heavy rainfall has had a positive but limited impact, taking away the need for further restrictions on use this year but restoring only part of the deficit.

The GMB’s claim that “less than 1% of the UK rainfall is diverted to be collected and stored to be used for human purposes” also suggests that companies are failing to make the most of the water in the environment for public use. This simply is not the case. Around half of the effective rainfall within the River Thames catchment is licensed for use, making it very intensively used in comparison to other areas.

The closure of redundant water treatment works and associated storage reservoirs is a process that has been taking place across London for the last 400 years, as new works are commissioned or other works upgraded.

Many of the raw water reservoirs listed by GMB were closed either by the Metropolitan Water Board or Thames Water Authority. Some were planned for closure by Thames Water Authority prior to privatisation, reflecting the plans for the London Ring Main, constructed to transfer large volumes of water around the capital. The Ring Main was eventually commissioned after privatisation in 1989.

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I www.thameswater.co.uk

The Ring Main provided additional capacity of 1,300 Mld, around two-thirds of the capital's daily total water usage. Subsequently, many small reservoirs providing only local storage became redundant and were decommissioned.

Reservoirs made redundant by the commissioning of the Ring Main include:

- **Barn Elms reservoirs.** Constructed in 1896/7, the four reservoirs provided a storage capacity of 1354 mega litres (Ml). To put this and the figures which follow into context, our total supply to London is around 2,000 Ml every 24 hours. The site is now an award winning nature reserve, the London Wetland Centre, after the reservoirs were taken out of use in 1997.
- **Molesey (Chelsea) reservoirs** were constructed in 1877, with a total capacity of 785 Ml. **Molesey (Lambeth) reservoirs** were constructed between 1874 and 1903, with a total capacity of 1850 Ml. The original treatment works were small and only for local supply. During the 1990s these reservoirs were noted in inspection reports as old and in need of structural repairs to ensure their safe continued use. Water levels were continuously low, requiring uplifting pumps to transfer the water into the treatment works. This was uneconomical, and water quality poor due to algae. All the Moseley reservoirs were taken out of use in 2000, and the sites subsequently developed for gravel extraction.
- **Stoke Newington reservoirs** consists of two (East and West) raw water reservoirs built in 1831 to 1893, with a total capacity of 409 Ml. The East reservoir has been retained as balancing storage for the New River before it transfers water from Hertfordshire to Coppermills Water Treatment Works. The West reservoir was transferred to the Local Authority after the closure of the Stoke Newington Water Treatment Works around 1990 and is used for recreation.
- **Kempton storage reservoirs** (East and West) had a combined capacity of 1364 Ml and were constructed in 1906. Both reservoirs were found to be leaking through corroded pipework in the embankment and hence deemed structurally unsafe, and emptied. The repairs needed were major and considered uneconomical (prior to privatisation), therefore the unstable embankments were removed around 1996. Since this time, the East reservoir has been a nature reserve and a Site of Special Scientific Interest (SSSI), attracting a wide range of birds.

As most of these reservoirs were converted to support wildlife and community recreational facilities, it is impossible to put a monetary value on the sites. Where parts or all of our sites are sold, the proceeds are shared with customers through lower prices, in line with arrangements set by Ofwat.

Beyond those reservoirs made redundant by the Ring Main, we have since privatisation taken out of service some very small raw water storage reservoirs, mainly as a result of concerns for public safety and water quality. Other factors that have led to closures include the high cost of repair and maintenance, which has in some cases made it uneconomic to continue to operate sites. The sites include:

- **Cheshunt (Brookfield Lane)** included two raw water reservoirs with a combined capacity of 177 MI. Only the South reservoir is owned by Thames Water, while the North reservoir is owned by the Environment Agency. The South reservoir was constructed around 1837, but has always leaked. It was never used for water supply, and only for temporary flood storage. The last Statutory Report under the Reservoirs Act in 2006 recommended it should be discontinued to ensure public safety. The site was sold and subsequently used for housing development.
- **Bath Road** reservoir was a service reservoir (storing treated water) and had a capacity of 13.64 MI. It was made redundant when a new pumping main from Fobney Water Treatment Works to Tilehurst Reservoir was commissioned. Tilehurst Reservoir has a total capacity of 120.9 MI, more than four days storage and well in excess of the capacity of Bath Road reservoir.
- **Lonsdale Road** was also a service reservoir, constructed in 1957 with a capacity of 47.7 MI. It was retained as a balancing tank after the ownership was transferred to London Borough of Richmond in the 1970s. The site was then developed by St Paul's school, but we retain three operational service reservoirs beneath the playing fields.
- **Holtwhites Hill Reservoir** was another service reservoir, with a capacity of 7.95 MI. It was closed due to its poor structural condition and water quality issues. As an alternative method of supply, Sewardstone Reservoir provides adequate storage to serve the Sewardstone area in North London, which Holtwhites Hill originally supplied.
- **Lea Bridge Water Treatment Works** had no storage capacity and was made redundant by the new Coppermills Water Treatment Works in 1969.
- **Middlesex Filter Beds** was a small local treatment works with no storage capacity that was inherited prior to Thames Water's ownership. It was made redundant by improvements at nearby Kempton and was taken out of use in the early 1980s.
- **Buckhurst Hill reservoir** was a service reservoir with a capacity of 3.6 MI, constructed in 1896. The reservoir structure was in poor condition and became redundant following an extension to Chigwell Reservoir, which had a greater capacity of 45.9 MI.
- **Hornsey Water Treatment Works.** We still use a reservoir (which has a capacity of 102.3 MI) at this site to hold water that arrives from springs in Hertfordshire via the New River. An upgrade at the site released some land which was sold off for development

The GMB go on to argue that Thames Water should have put in place a scheme to transfer water from the River Severn to the River Thames and boost water resources for abstraction to existing reservoirs.

A Severn-Thames transfer is among several long-term options we are assessing to determine how to ensure water supplies in our region meet projected demand, at the

lowest total cost to customers and the environment, but none could be delivered in time to alleviate the current water shortage.

The Cotswold Canal, which GMB envisage could be used for the transfer, is for significant parts of its length no more than a dry ditch and in places virtually undistinguishable from the adjoining fields. The Sapperton canal tunnel, which forms part of its route, is in a poor state of repair to the extent that part of it has collapsed. It is clear that it does not at present provide the infrastructure that would be needed to make a transfer scheme possible.

We completed a Scoping Report on the Severn-Thames transfer scheme for our Water Resources Management Plan, most recently in January 2012. It is available to review online at www.thameswater.co.uk/cps/rde/xbcr/corp/wrmp-severn-thames-appropriate-assessment-scoping-report-January-2012.pdf and will be further considered as part of our future water resources planning process.

In conclusion, it is clear that the redundant sites would have had little or no material impact on our ability to store water during periods of shortage. Neither the closure of redundant facilities, nor the absence of a Severn-Thames transfer are the cause of the water use restrictions, which are a result of below average rainfall over a sustained period.

I trust this information is helpful but please do let me know if you would like any further information on this or any other issue.

Yours sincerely

Richard Aylard CVO
External Affairs and Sustainability Director

Appendix: GMB press release

Tuesday 1st May 2012

CLOSING RESERVOIRS IN SOUTH EAST WHILE NOT DIVERTING WATER FROM SEVERN AS RAINFALL RUNS INTO SEA IS SERIOUS MISMANAGEMENT SAYS GMB

The Environment, Food and Rural Affairs Select Committee must call on Thames Water, the other private water companies, The Environment Agency and Ofwat to account for allowing parts of this nation to run short of water says GMB

GMB, the union for water workers, is asking MPs on the Environment, Food and Rural Affairs Select Committee to call Thames Water and the regulatory bodies to account for the closure of 25 bulk water storage facilities in the South East before implementing plans to divert water from Severn. This leaves rainfall running off to the sea while the region is subject to drought orders.

Less than 1% of the UK rainfall is diverted to be collected and stored to be used for human purposes. See list of water storage facilities closed in notes to editors below. Maps are attached as pdfs.

GMB has previously complained that Thames Water has not developed the disused Severn Thames canal course to divert water into the region from water in the Severn running off to the sea. *See table in notes to editors below for average water usage per day by area in 2005. GMB is updating this table. See also map of course of Severn Thames canal as pdf.*

Gary Smith, GMB National Secretary for Water, said "The mission of a water undertaking is to deliver the water needed for human purposes and for industry. That requires proper direction and management. Both have been sadly missing in Britain for the past twenty years.

Storage and transfer are two of the main elements of water resource management: one to move water from times of plenty to times of shortage; the other to convey water from places where it is plentiful to areas where it is in short supply. The third basic element is treatment to regulate water quality.

It cannot be repeated often enough that there is no shortage of water in Britain. We divert only a small fraction of the throughput of our water cycle for human purposes. We use less than 1% of total UK rainfall and less than 10% in the South East.

The best guide to theory is practice. Closing 25 water storage facilities in the south

east before diverting water into the region from the Severn has left the region short of water twice in the space of six years.

Water is a natural monopoly. Yet the recent White Paper looks to introduce “competition”, a nonsense policy to further mis-directing managers on top of privatisation. Since 1990 Thames Water has paid out £5 billion as dividends to shareholders, raised from households, that should have been used to divert water into South East and Eastern England.

The Environment, Food and Rural Affairs Select Committee must call Thames Water, the other private water companies, The Environment Agency and Ofwat to account for needlessly allowing parts of this nation to run short of water.”

End

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Physical Asset Strategy Manager
Veolia Water Central
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Hertfordshire
AL10 9EZ

6 July 2011

Dear

Mike,

Health and Environment Committee Meeting – 12 June 2012

Thank you very much for your contributions at the London Assembly's Health and Environment Committee meeting on 12 June. You will recall that, during the meeting, we agreed you would provide further information on a couple of issues. I would appreciate it if you could therefore provide the following written information:

- How Veolia assesses the cost of the water it provides, including how this is composed of various factors including extraction, treatment, movement and storage. How infrastructure costs are reflected. How social and environmental costs and other externalities are reflected. Details of any shadow pricing or similar methodology used;
- How Veolia determines the price it charges to consumers;
- Further information on your approach to the economics of leakages, specifically your approach to prioritising this work over other water supply and demand measures; and
- Explain further the context for water trading, your water trading relationship with Thames Water and give an example of how much water trading would be required between both companies to bring an end to the water use restrictions currently in place.

Thank you for agreeing to provide further written responses as well as attending the Committee's meeting. If you are able to respond by the end of July, the Committee would be grateful. If you can copy your response electronically to ian.williamson@london.gov.uk, that would be very helpful.

For your reference I attach a copy of the transcript of the discussion.

Yours sincerely,



Murad Qureshi AM
Chair of the Health and Environment Committee

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Regina Finn
Chief Executive
Ofwat
Centre City Tower
7 Hill Street
Birmingham
B4 5UA

6 July 2011

Dear *Regina,*

Health and Environment Committee Meeting – 12 June 2012

The London Assembly's Health and Environment Committee meeting on 12 June discussed water management in London. An invitation had been made to Ofwat to send a representative, but at that stage no-one was able to attend. It was, however, indicated that you would be willing to respond to questions in writing. Thank you very much for this assistance.

The discussion at the meeting made it clear that Ofwat would be the body to answer a number of questions that were raised. Therefore:

Could you please outline briefly the factors you take into account in your regulatory decisions?

Please explain in more detail your methodology for setting leakage targets for water companies, and in regulating the use of powers by water companies to install meters and use them for billing. Water companies told the Committee that they had proposed greater action to reduce leakage, and Ofwat had decided that there were other priorities for expenditure – please explain from your point of view this decision and the rationale behind it.

In particular, please set out how you reflect the costs, including environmental costs and other externalities, of leakage.

Does Ofwat use a shadow price for water or similar methodology? How is this calculated? What factors are included, with particular reference to economic, social and environmental costs in the long term. How is the value to users of water supply (or costs of interruptions or risks to supply) reflected? How is the value of water left in the environment reflected?

Does Ofwat have plans to review these methodologies? If so, please outline them and whether and how the above issues will be addressed in the reviews.

Could you briefly outline Ofwat's position on the introduction of water meters universally throughout the UK.

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Could you please provide some information on social tariffs, their considered advantages and disadvantages, and what plans if any OfWat has to review consumers costs on the basis of their use.

I attach a copy of the transcript of the discussion on 12 June by way of context to the above requests

Thank you again for agreeing to contribute to the Committee's work in this way. If you are able to respond by the end of July, the Committee would be grateful. If you can copy your response electronically to ian.williamson@london.gov.uk, that would be very helpful.

Yours sincerely,

Murad Qureshi

Murad Qureshi AM
Chair of the Health and Environment Committee



Water today, water tomorrow

Mr Murad Qureshi AM
Chair, Health and Environment Committee
London Assembly
City Hall
The Queen's Walk
London
SE1 2AA

3 August 2012

Dear Mr Qureshi

Re: Health and Environment Committee Meeting – 12 June 2012

Thank you for your letter of 6 July 2011 to Regina Finn, on behalf of the London Assembly's Health and Environment Committee. While we were unable to attend your recent evidence session on water, we are pleased to respond to your questions and hope that this will help you in your work. Ms Finn has asked me to respond directly as the lead on water resource policy in Ofwat, which includes leakage and metering.

As the economic regulator of the water and sewerage industry in England and Wales, our role is to make sure that customers get a fair deal, while ensuring that the companies can continue to provide a safe and secure water supply. Our strategy, 'Sustainable water', is about making sure that companies deliver a sustainable water and sewerage service to customers, both now and for future generations.

Taking regulatory decisions

One of our main regulatory tools is setting price limits. Every five years we carry out a review of the prices that water and sewerage companies and water only companies can charge their customers. We scrutinise these charges to make sure they represent the best value for customers, while allowing efficient companies to finance their functions and deliver sustainable services to customers today and in the long term.

.../...

As part of the price review process, each company submits a business plan. This sets out its specific proposals for all aspects of its water and sewerage business for the coming five-year period, set in the context of its longer-term strategy. The business plan includes proposals for expenditure to balance water supply and demand, which must be based on the company's water resources management plan (WRMP) – I explain further the status of the WRMP below. We set price limits that will enable an efficient company to balance water supply and demand in the best interests of its customers and the environment.

Once we have set price limits, each company is responsible for delivering services to customers, which includes maintaining secure water supplies, and meeting its environmental obligations. The Environment Agency (EA) also has a role in managing water resources by licensing abstractions from water sources.

Water resources management plan

The WRMP is at the heart of decisions around water resources in the price setting process. It sets out how the company will maintain a balance between water supply and demand over the coming 25-year period. Each company must prepare a WRMP in consultation with its stakeholders. Ofwat and the EA are statutory consultees. When it has completed its consultation, each water company can only publish its final plan with the permission of the Secretary of State for the Environment, Food and Rural Affairs. The company is then responsible for maintaining a balance between water supply and demand, as set out in its WRMP.

Defra, Welsh Government, the EA and Ofwat jointly prepare a Water Resources Planning Guideline, which companies must follow when they prepare their WRMPs. This guidance expects companies to take account of all of the costs and benefits of options to balance supply and demand, including the social (traffic disruption, interruptions to supply etc.), environmental (carbon emissions, impacts on the water environment etc.) and financial costs and benefits. In effect, this means that companies take into account a shadow price for water.

Calculating social and environmental costs and benefits

Calculating social and environmental costs and benefits is difficult, but we think that there is scope to improve the way that water companies do this. In collaboration with Defra and the EA, we are currently reviewing how the companies apply guidance on social and environmental costs and benefits. We will update the guidance, where appropriate, in the light of that review. There is of course scope for companies to innovate in how they capture this information and we will ensure that the incentives we put in place through our regulation encourage that type of innovation.

.../...

Calculating leakage targets

When they propose leakage targets, companies have to take into account the wider balance between water supply and demand, impacts on the environment, and also the impact on customers' bills. Leakage has reduced by around one third since its peak in the mid-1990s. We know from feedback and research that customers want their suppliers to reduce leakage further. The companies need to respond to this. But we also know that customers want reliable supplies at a reasonable cost.

To put the cost of repairing leaks into some context – it would cost around £100 billion to reduce leakage by half, across England and Wales. If customers had to make a one-off payment in their bills to finance that, it would cost them over £4,000 each, on average. That would be unaffordable or unacceptable for most customers.

The companies need to strike the best balance between the costs and benefits of reducing leakage, taking account of their customers' views. They do this as part of their water resources management plans, where they identify a 'sustainable, economic level of leakage (SELL)'. For the price review period from 2010-11 to 2014-15, each company proposed leakage targets on the basis of its SELL calculations. We challenged these proposals where appropriate, before confirming targets as part of the package that each company has to deliver while meeting its price limits.

Current leakage targets mean that by 2015 a further 36 billion litres of water will be saved annually. If companies fail to meet those targets, we will take action. In the last 6 years, we have made them pay out more than £230 million, from their own pockets, for underperformance on leakage.

In its business plan, Thames Water proposed to reduce leakage by 23 Megalitres per day (Ml/d) during the 2010-15 period. We did not make allowance in price limits for this because there was insufficient evidence that it represented value for money for Thames Water's customers. A key reason for our decision was that while the company argued that it needed to reduce leakage to address the impact of climate change, it used old data.

None of the companies, including Thames Water, had time to draw on new ('UKCP09') data from the UK Climate Impact Programme when they prepared their business plans. Because of this, it was not appropriate to increase customers' bills to finance investment, which, in the light of the new analysis, might not have been required. At the same time, we were keen to ensure that investment that is necessary to maintain secure supplies for customers is identified and made quickly. So, we provided a specific option for companies to apply to us to review their price limits before the next scheduled price review if, in the light of the new data, the

.../...

company confirmed a need for such investment. This was the best way to make sure that customers' bills fund the right, sustainable investment for the long term. Neither Thames Water nor any other company has come to us to propose such a change. We note that Thames has reduced leakage significantly during this period, achieving 637MI/d in 2011-12 against a target of 673MI/d, under the price limits we set.

Veolia Central also proposed year on year reductions in leakage from 2010 – 2015. Yet the company's own analysis showed that leakage reduction would not be cost beneficial. We agreed with this analysis, concluding that the proposed expenditure did not represent good value for customers. So, we expected the company to maintain its 2009-10 level of leakage through to 2015.

Looking ahead, we are reviewing the way that we regulate – including the way that we regulate leakage. We are conscious that the annual leakage targets that we currently set apply rigidly over a five year period. Instead, we want the companies to respond more dynamically to customer demands and weather variation. Our wider regulatory reforms will encourage the companies to focus more on delivering the services that customers want, and innovating continuously to achieve better value.

Metering

Currently around 40% of customers in England and Wales have a water meter. We expect this to rise to 50% in 2015. We think that metered charges are the fairest way for customers to pay for their water use – and research shows that this is what customers think too. Metered charges also provide an incentive for customers to use water wisely.

We actively encourage water companies to meter their customers where they are able to do so, as long as there is a reasonable prospect that the benefits are likely to outweigh the costs (including environmental and social costs and benefits). And we make sure that the overall level of charges for customers who remain unmetered reflects the amount of water that the unmetered group uses as a whole.

However, the circumstances in which companies can meter their customers are not unbounded and it is the UK and Welsh Governments who decide under what circumstances this can happen. So, for example, for a company to roll out compulsory metering, it must demonstrate to the Secretary of State that it is in a seriously water stressed area.

.../...

Letter to Mr M Qureshi
2 August 2012
Page 5

Social tariffs

Defra has recently published final guidance to water companies on social tariffs. This guidance discusses their perceived advantages, not least the opportunity for companies to support customers who are struggling to pay their water and sewerage bill. The guidance attempts to limit the possible disadvantages arising which include:

- other customers' bills increasing to pay for the subsidised tariff;
- the tariff being ineffective and not good value for money; and
- companies using social tariffs where other measures, such as metering, may be more effective.

We have also published a number of documents looking at the issue of affordability. These include our focus report 'Affordability for all', which is available on our website.

We have a duty to protect consumers, and must have regard to the interests of individuals in particular vulnerable groups. So, we welcome the Government's social tariff guidance as an additional tool to help companies to address affordability problems. Our role when approving companies' charges schemes will be to consider whether companies' proposals are consistent with that guidance.

I hope this is helpful. If you need any further assistance, please do not hesitate to contact me.

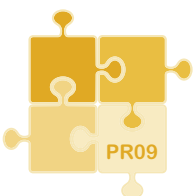
Yours sincerely



Paul Hope
Head of Water Resources

Future water and sewerage charges 2010-15: Final determinations

Protecting consumers, promoting value, safeguarding the future



About this document

This document has four key objectives.

- It describes Ofwat's approach to setting price limits for the water and sewerage companies in England and Wales for the five years 2010-15. It concentrates on where we have developed or adapted the approach we set out in March 2008 in our paper 'Setting price limits for 2010-15 – framework and approach'.
- Along with the company-specific leaflets available on our website, it sets out the price limits for each company for each year of the five-year control period. It also explains the expected changes in bills for each year.
- It summarises the services and outputs that companies will have to deliver to their customers – showing the levels of service they can expect and the bills they will have to pay.
- It explains the reasons for and background to our decisions, including the financial aspects, to enable stakeholders to understand how we have moved to these final price limits from the draft price limits published in July 2009.

Where we refer to bills in this document, we use 2009-10 prices using the basket year (that is, November 2008) RPI. For assumptions on costs and expenditure, we use 2007-08 prices based on the financial year average RPI unless we state otherwise.

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Foreword

This document sets out the decisions of Ofwat (the Water Services Regulation Authority) on price limits for the regulated water companies in England and Wales for 2010 to 2015.

This is the fourth determination of price limits since privatisation 20 years ago. Much has been achieved in those two decades. The UK has shed its reputation as the 'dirty man of Europe'. We have world-class drinking water, fish have returned to the river Thames and we have more than 100 blue flag beaches and marinas in England and Wales.

These improvements are the result of a substantial investment programme. By 2010, the companies will have invested about £85 billion (in today's prices) to maintain and improve assets and services. Our price limits allow for another £22 billion of capital expenditure in the next five years. At 94p a day on average, water bills for most customers represent good value for money.

Our stable, transparent and consistent regulatory framework is a key ingredient in the sector's success. We have built on and improved our process, ensuring we focus on meeting customers' needs and securing the long-term sustainability of the sector. We began our review with the innovative strategic direction statements. These allowed each company to set out for its customers and other stakeholders its goals and aims for the next 25 years. At the same time, companies developed water resource management plans for a similar timeframe. Using these as a backdrop, companies produced detailed business plans for the five years to 2015.

We consulted extensively on draft price limits, listened carefully to representations, took account of the most up-to-date information, and we have made final decisions that are balanced and robust. Our price limits are consistent with the long-term view, take account of customers' views, acknowledge the current difficult economic climate, and enable well-run companies to finance their functions during both good times and bad.

Our decisions mean that average water and sewerage bills will remain at 2009 levels (excluding inflation) over the five-year period. This is significantly lower than in companies' final business plans, which proposed an average increase of about £31. At the same time, the major capital investment programme of more than £22 billion will ensure this crucially important infrastructure will continue to support safe, secure services to customers. It will also continue to address new environmental, security and drinking water standards.

With price limits set for the five years up to 2015, we have an opportunity to review how best to set prices in the future. By 2014, the wider debate on delivering sustainable services, our work in harnessing market forces and possible new legislation may have changed how we think about setting prices. We look forward to continuing to work closely with our stakeholders to deliver a robust regulatory framework for sustainable water and drainage services for the customers of England and Wales.



Regina Finn
Chief Executive

1. Key messages

This document sets out our final determination of price limits for the 10 water and sewerage companies and 12 water only companies in England and Wales for the five years from 1 April 2010. Our price limits will allow each company to fulfil its duties under legislation and its operating licence. We have set price limits that fulfil our statutory duties, take account of guidance from the Secretary of State for the Environment, Food and Rural Affairs and the Welsh Assembly Government, and align with our strategy and vision.

- The price limits we have set increase by an average of 0.5% a year before inflation. They will lead to average household bills falling just below today's levels – by £3 in real terms over the period to 2015. This compares with an increase of £31 that the companies proposed in their business plans – an increase of 9%.
- We have set price limits in accordance with our methodology set out in '[Setting price limits for 2010-15: Framework and approach](#)' (March 2008). Our methodology is tried and tested, and we have continued to use our stable, consistent and transparent approach to regulation.
- We have taken our price review decisions in the same long-term context we asked companies to use for their 25-year strategic direction statements (SDS) and their business plans. We have made a full consideration of companies' business plans and proposals; to these we applied a rigorous and consistent challenge to all business areas and all companies.
- Price limits allow for a capital investment programme of more than £22 billion – this is a significant programme and is higher than any previous five-year period. We have included nearly all the statutory proposals to improve the environment and water quality, including more than 99% of the agreed National Environment Programme (NEP). Where there was not a statutory basis, we took account of the views that customers had expressed in response to our extensive customer research.
- At the beginning of the price review, we said that we would put customers at the heart of the process. At the time, we could not have anticipated the seismic change in the economic and financial environment. Even so, our rigorous approach to setting price limits means that customers can be sure that the significant investment programmes to increase levels of water metering, reduce flooding from sewers, and improve the resilience of key company assets, offer real and lasting value.

- We expect all companies to become more efficient and have challenged proposals for investment based on their scope and costs. Our approach provides incentives for strong well-managed companies to outperform.
- We have listened to what stakeholders told us about our draft determinations. We have included additional risk mitigating mechanisms for bad debt and Environment Agency charges; we have updated our operating expenditure assumptions using improved information on business rates, energy costs and pensions, and we have taken account of new information on the impact of the economy on the industrial demand for water. In addition, we have reviewed our capital investment decisions in the light of better information from companies. This has resulted in greater capital expenditure (by about £1.3 billion), which will deliver more improvements for customers.
- A key aspect of our work is a careful analysis and understanding of the business risks that the companies face. We are clear that this is a relatively low-risk industry – as it should be as the provider of two of the most essential of public services. In this price review process, we do not seek to increase the risks that the companies carry – but we do want to make sure that customers share in the low-risk characteristics wherever possible. This means making financial assumptions that fully reflect the nature of the business and the role of the regulator.
- We have allowed a real cost of capital of 4.5% post-tax. This is unchanged from our draft determinations. This allows a cost of equity of 7.1% and takes account of higher future costs of debt while recognising the low costs of debt that the companies secured before the decline in financial markets.
- We have targeted financial ratios that are consistent with an A-/A3 credit rating. The majority of companies are in this position. Where one particular indicator (and in a small number of cases, two indicators) for a single rating agency may not meet the required threshold, we ensure that it meets the criteria for a strong BBB+/Baa1 credit rating.

Figure 1 What the companies are investing in

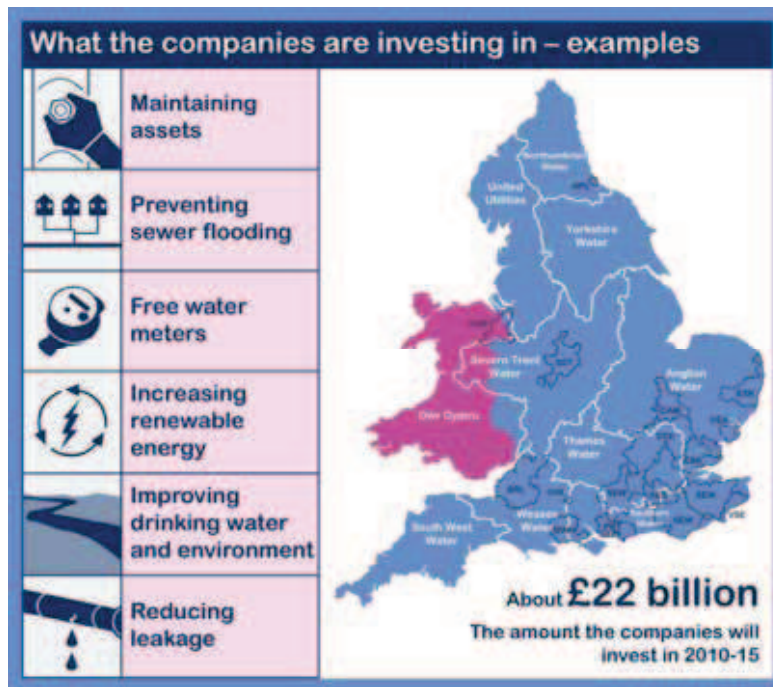


Figure 2 How the money will be invested over 2010-15



This document explains in more detail how we have achieved these things.

1.1 Our duties

We have taken our decisions on price limits in accordance with our statutory duties. We consider that our approach to setting price limits:

- protects the interests of consumers;
- secures that the companies to which the price limits apply are able to finance the proper carrying out of their functions;
- promotes economy and efficiency on the part of those companies; and
- contributes to the achievement of sustainable development.

We have reached our decisions on price limits having considered the final business plan submitted by each company and their representations on our draft price limits. We have considered the representations of customers, including those presented on their behalf by the Consumer Council for Water (CCWater), on our draft determinations.

We have taken account of the strategic policy statements on water for both England and Wales and made decisions that are consistent with social and environmental guidance issued by the Secretary of State for the Environment, Food and Rural Affairs and the Welsh Assembly Government. Our price limits take account of the formal guidance issued by Secretary of State for the Environment, Food and Rural Affairs and the Welsh Assembly Government. We have also taken advice from the quality regulators – the Drinking Water Inspectorate (DWI) and the Environment Agency, working where appropriate with Natural England and the Countryside Council for Wales.

We have also had regard to the principles of best regulatory practice throughout the decision-making process and will continue to do so. We have paid particular regard to the principles under which regulatory activities should be transparent, accountable, proportionate, consistent, and targeted only at cases that need action.

1.2 Drivers of change in the average household bill

At the industry level, our price limit decisions would lead to average bills (before inflation) which end the five-year period slightly below (by £3) today's levels. Table 1 shows what is driving the change in bills and how the key expenditure components contribute to the reduction.

Table 1 What is driving the changes in bills?

(in 2009-10 prices)		Total	
		(£)	(£)
Average bill in 2009-10		343	
(1)	past efficiency savings and outperformance	2	
(2)	maintaining base services	(26)	
	Of which: a) changes in revenue		(14)
	b) changes in operating costs		7
	c) changes in capital maintenance		1
	d) changes in impact of taxation		(7)
	e) changes in the cost of capital		(13)
(3)	maintaining and enhancing security of supplies to all consumers	9	
(4)	the impact of improvements in services	21	
	Of which: a) drinking water quality		4
	b) environmental improvements		15
	c) improvements in service performance		2
(5)	scope for reduction through future efficiency improvements	(9)	
Average bill at 2014-15		340	
Change from end of the last period		(3)	

The table shows that behind the small decrease in bills there are notable upward pressures. Most of these relate to the need for the companies:

- to invest to improve services to customers and improve the environment;
- to pay higher operating costs, including increased business rates and energy costs; and
- meet pension liabilities.

However, the assumptions we have made on the cost of capital, future efficiency and revenues, when combined with the lower impact of taxation, lead to an overall decrease in average bills, in real terms (before adjustment for inflation) of £3. We will provide further detail on each of these drivers of change in bills in the following chapters of this document.

Of course, the factors driving the changes in bills are different for each company. We have included a similar table for each company in the [2009 price review \(PR09\) determinations](#) section of our website.

1.3 Comparing final determinations to final business plans

Companies' final business plans would have added £31 to bills – an increase of 9%. Table 2 compares our price limits with those that the companies proposed in their final business plans. The table shows that our price limits are lower than those that the companies proposed by an average of 2% a year.

Table 2 Business plan and final determination price limits (industry level)

Price limits	2010-11	2011-12	2012-13	2013-14	2014-15	Average
Water and sewerage companies (weighted average)						
Business plans	5.1	2.2	2.5	1.4	0.7	2.4
Final determinations	-0.8	0.2	1.7	0.7	0.5	0.5
Water only companies (weighted average)						
Business plans	12.1	3.1	2.4	1.3	0.7	3.8
Final determinations	1.6	1.6	0.3	-1.1	-0.8	0.3
Industry (weighted average)						
Business plans	5.6	2.3	2.5	1.4	0.7	2.5
Final determinations	-0.6	0.3	1.6	0.6	0.4	0.5

1.4 Representations on the draft determinations

In 'Future water and sewerage charges 2010-15: draft determinations' (July 2009), we sought representations from the companies, customers, the Consumer Council for Water (CCWater) and other stakeholders on our draft price limits.

Throughout the price review process, we have worked closely with key stakeholders including DEFRA and the Welsh Assembly Government. In addition, in Wales we have joined the PR09 forum for Wales. This allowed us to understand the particular price review issues in Wales; members of the forum also provided representations on our draft determinations.

We received more than 50 representations (in addition to 450 concerning a sewer flooding issue in Alcester, Worcestershire) from a wide range of stakeholders in addition to the water and sewerage companies and the quality regulators. Each of the CCWater committees provided a response (which they have published on their [website](#)) as did groups that represented particular interests, for example the Royal Society for the Protection of Birds (RSPB), Water UK and the Society of British Water and Wastewater Industries. Individual customers responded, mostly focusing on local issues; and a number of elected representatives contacted us. We include a list of the respondents to our draft determinations in appendix 1.

Each company provided full and detailed written representations on its draft determination. In some areas, they considered that we had not treated company-specific issues correctly; in others, they suggested that we had made errors. They also challenged aspects of our approach, questioning the scope of some of the assumptions underlying our draft determinations.

In addition to considering representations, we have dealt with specific queries from the companies arising from the detailed information we provided to them with their draft determinations. We received more than 500 questions. We also met each company to hear its material concerns.

As well as receiving written representations from each CCWater regional committee on our draft determinations, we met representatives from each committee. At these meetings, the CCWater members set out their views on the draft determinations and on the areas where they thought we should revise our approach. They also sought further explanation on some of our decisions. The CCWater committees play an important part in helping us to understand customers' concerns.

As part of our accountability to Parliament, we also contributed evidence to the Environment, Food and Rural Affairs Committee's investigation into the price review. We have responded to its report and recommendations.

1.4.1 Representations from CCWater and customers

CCWater generally welcomed our draft determinations. They carried out customer research to understand customers' views on the draft determinations and found that more than 80% of respondents considered the proposals were acceptable. In their meetings with us, the regional committees concentrated on a small number of discrete areas, with some stronger representations on company specific issues.

The main cross-cutting issues that CCWater raised included:

- the need for further improvements for customers in specific areas, including reductions in sewer flooding and improved drinking water aesthetics;
- a reduction in their perception of the risk of asset failure in the future;
- better protection against higher bills for customers who were transferred to a metered supply;
- the view that the cost of capital was set too high at draft determinations; and
- smoothing bills to counteract the effect of inflation.

Despite these concerns, CCWater did not want to see bills much higher than those in our draft determinations.

We were pleased that the CCWater research showed that customers supported our draft determinations. While price limits are slightly higher, the increase secures more outputs,

improved service and lower risk for customers. We have taken steps to improve the outputs that matter most to customers (in particular more sewer flooding reductions and improved water taste and odour) and to improve the associated incentives that will reduce the risk of failures in the future. We will work with CCWater and companies on the issues arising from compulsory metering.

We explain our view on the cost of capital in chapter 5 of this document.

We have looked at smoothing bills for inflation. We conclude that the resulting increases in the total amount paid by customers were not consistent with CCWater's wish for customers to pay any more than was necessary.

1.4.2 Issues raised by companies in representations

The companies used their representations to highlight aspects of our draft determinations that they wanted changed. Generally, but not exclusively, they did not comment on aspects they found acceptable. The responses from companies, in most cases, expressed concerns with our draft determinations (as they have at this stage of previous price reviews). They argued that our decisions resulted in an unacceptable package. However, not all companies were equally critical. Some acknowledged:

- the improved structure of the price review (including the SDS phase and the draft CIS baseline);
- the benefits accruing from incentive schemes set up at previous price reviews; and
- our willingness to engage on matters of detail affecting price limits.

Even so, overall the companies expressed negative sentiments about the following issues of concern raised in many representations.

- Aspects of Ofwat' use of the capital expenditure incentive scheme (CIS).
- Levels of capital maintenance.
- Assumptions on future efficiency.
- Allowances for 'known' future operating costs
- Lack of incentives and rewards for outperformance.
- Increases in the operating and financial risk carried by the companies.
- The need to increase price limits to cover the full costs of pension deficits.
- Financing assumptions.
- Assumptions on capital structure.

We discuss the representations on CIS and levels of capital maintenance expenditure in sections 4.2 and 4.3. Operating expenditure, including pensions costs are discussed in section 4.9; financing issues are set out in chapter 5.

The company representations included a general theme that the draft determinations would not leave them in a financially viable position. They cited the following general reasons.

- The balance of risk has shifted from customers to companies (effectively shareholders) without commensurate increased reward (discussed in sections 5.3-5.6).
- Tough efficiency challenges and lack of recognition of known operating cost increases have reduced the opportunity (and incentive) to outperform, thus reducing the attractiveness of the sectors to equity. Smaller companies argued that this had a significant impact on them (discussed in sections 4.9, 4.10 and 5.5).
- The draft determination CIS ratios (with all companies above 100) created a “penalty” that means that even efficient companies cannot achieve a reasonable overall rate of return (discussed in sections 4.2 and 5.9).
- Greater headroom was required against the benchmark financial indicators to take account of the current economic climate including the prospect of an extended period of deflation (discussed in sections 5.3-5.6).
- More notified items were needed to mitigate the risk associated with a range of issues including bad debt, energy and tax (discussed in sections 4.9 and 5.3).

Other finance related issues that more than one company raised included:

- a view that our cost of debt and equity assumptions were too low;
- a suggestion that our financeability test should be made after all cash flows rather than before taking account of incentive mechanisms;
- it was unrealistic to assume equity injections would resolve financeability; and
- a claim for a small company premium on the cost of capital for the water only companies.

We discussed these concerns with each company in our strategic meetings with them. These meetings also raised two general (but far from universal) issues of perception and communication arising from our draft determinations.

- Companies suggested that we had started the decision-making phase of the price review with a presumed outcome of decreasing price limits. This is clearly not the case – while the average price limits and bills remain close to zero, there is clear variation around this from company to company. Of course, we did have certain presumptions – that we would put customers at the heart of the price review (recognising the current economic circumstances), and that we would set price limits which allowed efficient companies to deliver the outputs relating to

statutory programmes of improvement. The resulting price limits achieve these aims.

- Companies were concerned that we had not had sufficient regard to the long term, in particular, that we had not taken enough account of the strategies set out in the 25-year SDS. We believe that for each company there are clear links between the SDS, the long term and our price limits. This is largely because the innovative SDS began a process by which companies could bring long-term issues into their business plans, allowing us to make decisions that address these. Accordingly, we have supported programmes of water resource development that will address longer-term issues, and our decisions relating to catchment management, renewable energy and resilience are focused clearly on the longer term.

Operating expenditure issues

In general, companies argued that the operating expenditure assumptions were insufficient and this contributed to financing concerns summarised above. The main issues of concern were that:

- the operating expenditure efficiency targets were too tough and not achievable (including the continuing efficiency target);
- we have not given specific uplifts for “known” operating cost increases; and
- there were insufficient notified items to address operating expenditure uncertainties.

Specific areas of concern included (but were not limited to):

- pensions;
- energy;
- bad debt;
- business rates; and
- Environment Agency charges.

We had already signalled that we expected to consider the overall operating expenditure based on the most up-to-date information. We expected to use the data provided in the June return to reassess relative efficiency, and we anticipated the need to make changes to business rates. Our final determinations include these changes, as well as new positions on pensions, power and notified items. We discuss these issues in section 4.9.

Capital expenditure

Issues raised on capital expenditure were generally quite company specific. However, generic issues included:

- where companies agreed with the principles of CIS but frequently did not like the outcome for their particular company;
- the use and application of our cost base tool, particularly for those companies where it led to high efficiency challenges;
- the asset management assessment (AMA) challenge for capital maintenance where there was general concern about how companies' proposals had been scored and a view that we had taken an "arbitrary" approach to challenge; and
- a concern that the new approach to capital maintenance increased the risk to services in the future.

We explain our position on these matters in sections 4.2-4.8 for expenditure and 4.10 on capital efficiency.

The key specific capital expenditure issues where there were concerns across more than one company included:

- expenditure on sewer flooding;
- allocation of expenditure to meet DWI requirements to capital maintenance;
- assumptions on metering costs;
- investment to reduce leakage and our approach to accounting for this; and
- our approach to expenditure proposals for investment to improve resilience.

These issues are addressed in sections 4.2-4.8 of this document.

We have reconsidered our position on each of these issues. In some cases, using new information provided to us, we have reached revised positions. Price limits include additional sewer flooding outputs and make provision for slightly more meters. We have worked with the DWI to improve the confidence in our approach to drinking water quality investment.

There were also various company-specific representations; we have addressed these in our company-specific documentation.

1.4.3 Issues raised by other regulators and NGOs

In general, other stakeholders welcomed our draft determinations. There were some concerns including:

- a desire to see more investment to reduce leakage and improve water efficiency (particularly through increased metering); and
- a concern that our approach to capital maintenance may increase the risk to the environment and public health in the future.

Our final determinations include more metering programmes and continue to support improvements in leakage and water efficiency.

1.4.4 Issues raised by the financial sector

The companies referred to the position of equity investors, and many cited the updated Water UK investor survey carried out after our draft determinations. We have held meetings directly with equity investors and some have sent in written submissions. These echoed the companies' submissions. They claimed that equity investors now carried too much risk, and that the ability to outperform was limited and did not provide sufficient reward. Investors pointed to the relatively poor performance of share prices immediately following our draft determinations. Debt investors appear more sanguine.

In our making our final determinations, we have considered the risk balance again. We have taken steps to improve the balance of risks that we think investors will value. This is set out in sections 5.3 to 5.6.

The credit rating agencies also published their views on our draft determinations. While Standard & Poors placed three companies publicly on 'credit watch', Moody's and Fitch had a stable outlook but noted the significantly reduced headroom in companies' financial projections. Moody's raised some concerns on aspects of the CIS process. We believe that the new CIS ratios – much reduced for our final determinations, addresses most of these concerns.

1.4.5 Issues raised by MPs and local government

We received some representations, most of which were generated in response to Thames' briefings on our draft determinations. Many of these representations concerned our approach to sewer flooding in one part of London. We explain our action to deal with this concern in section 3.2.2. One MP suggested that we were failing in our wider environmental duties by not requiring generally larger reductions in leakage and not requiring all companies to become even more water efficient. We set out our approach to leakage and water efficiency in chapters 3 and 4. Our decisions take account of the information provided to us by companies and regulators and are consistent with the current view of the longer term. However, our approach is flexible and we have put in place a notified item, which will support companies as they move to address water resource issues relating to climate change.

We received a few responses from local government concerning company-specific issues. We have addressed most of their concerns.

1.5 Next steps

Companies must now consider our final determinations. Each company has two choices.

- If a company disputes our final determination, it can require us to refer it to the Competition Commission to determine the price limits under dispute (it must exercise this right within two months of the final determination).
- If it accepts our price limits, it must work to deliver the outputs specified in the company-specific documentation.

If a company requires a reference to the Competition Commission, then it will base its bills for the first year of the period on our price limits. If the Competition Commission considers it appropriate to change the determination, adjustments are made to the company's price limits in subsequent years to accommodate those changes.

2. Price limits and bills



Our price limits for each company cover the five years from 1 April 2010 to 31 March 2015. However, our decisions are consistent with the longer time frame captured in each company's strategic direction statement and in other framework documents relating to water resources and housing growth. Our decisions also support actions to adapt to climate change and to mitigate the impact of the companies' activities on the environment now and in the future.

This chapter sets out the price limits for each company and the average bills that could result. We have also included a breakdown, at an industry level, of the expenditure in each of the key investment categories.

2.1 Price limits

Table 3 shows the price limit for each company for each year of the price review period and the average figure for each company for the five years. It also shows the annual average and five-year average for the industry as a whole. Over the five-year period at the industry level, these determinations increase price limits by an average of 0.5% a year.

Table 3 Price limits for 2010-11 to 2014-15

	Annual price limits					
	2010-11	2011-12	2012-13	2013-14	2014-15	Average ¹
Water and sewerage companies (WaSC)						
Anglian	-0.7	0.0	1.4	1.1	0.9	0.5
Dŵr Cymru	-1.3	-1.3	-0.4	-0.4	-0.6	-0.8
Northumbrian	5.0	3.8	0.9	0.0	-1.0	1.7
Severn Trent	-1.0	0.0	0.0	-1.0	-1.1	-0.6
South West	1.1	3.4	2.5	1.3	1.1	1.9
Southern	-0.7	0.0	3.6	3.3	-0.1	1.2
Thames	0.2	0.4	4.6	0.4	1.4	1.4
United Utilities	-4.3	-0.2	0.6	1.0	1.2	-0.4
Wessex	0.3	0.3	1.9	1.9	1.5	1.2
Yorkshire	-1.2	-1.3	1.4	1.8	1.6	0.5
WaSC average (weighted)	-0.8	0.2	1.7	0.7	0.5	0.5
Water only companies (WoC)						
Bournemouth & W Hampshire	4.0	2.1	-0.5	-0.8	0.2	1.0
Bristol	0.6	4.2	4.0	0.3	-0.2	1.8
Cambridge	-1.0	-1.0	0.9	0.2	-0.6	-0.3
Cholderton ²	2.4	-1.0	-1.6	0.8	-0.7	0.0
Dee Valley	0.6	0.6	0.6	1.0	-0.5	0.5
Portsmouth	-4.8	-2.1	-1.7	-1.4	-0.6	-2.1
South East	4.4	3.9	1.7	-1.4	0.6	1.8
South Staffs	1.5	0.0	1.9	0.0	-0.6	0.6
Sutton & East Surrey	0.0	0.0	2.0	1.4	-1.2	0.4
Veolia Central	1.4	0.8	-2.8	-2.8	-2.3	-1.2
Veolia East	-1.6	-1.4	-0.7	-0.7	-0.9	-1.1
Veolia Southeast	1.2	1.2	1.6	1.6	-0.9	0.9
WoC average (weighted)	1.6	1.6	0.3	-1.1	-0.8	0.3
Industry average (weighted)	-0.6	0.3	1.6	0.6	0.4	0.5

Notes:

1. The average for the price limits is the geometric average of the annual price limits.
2. Cholderton is a very small company. We have set price limits, but other than in this table and tables 4 and 5. Cholderton is not included in tables in the remainder of this document. It does not have a material effect on the industry averages.

While the average increase in price limits is 0.5% a year, there are variations at the company level. The five-year average change varies from -2.1% (Portsmouth) to +1.9% (South West). In general, the water only companies show smaller average increases in price limits (average 0.3% a year) mostly reflecting their relatively small capital programme and the reduction in the small company premium on the cost of capital (see section 5.5).

Table 4 compares our final price limits with those that the companies proposed in their final business plans. The table shows our final price limits are lower by 2.0% a year. The largest difference is for Sutton & East Surrey at 5.0% a year and the smallest is for Yorkshire and Wessex – both at 1.2% a year.

Table 4 Comparison of price limits with final business plan proposals

Annual average price limits			
	Final business plan average K	Final determination average K	Difference between final business plan and final determination
Water and sewerage companies			
Anglian	2.7	0.5	-2.2
Dŵr Cymru	0.7	-0.8	-1.5
Northumbrian	3.3	1.7	-1.6
Severn Trent	1.1	-0.6	-1.7
South West	3.4	1.9	-1.5
Southern	2.9	1.2	-1.7
Thames	3.9	1.4	-2.5
United Utilities	1.8	-0.4	-2.2
Wessex	2.4	1.2	-1.2
Yorkshire	1.7	0.5	-1.2
WaSC average	2.4	0.5	-1.9
Water only companies			
Bournemouth & W Hampshire	4.4	1.0	-3.4
Bristol	5.7	1.8	-3.9
Cambridge	1.7	-0.3	-2.0
Cholderton	2.4	0.0	-2.4
Dee Valley	1.9	0.5	-2.4
Portsmouth	2.4	-2.1	-4.5
South East	5.7	1.8	-3.9
South Staffs	3.4	0.6	-2.8
Sutton & East Surrey	5.4	0.4	-5.0
Veolia Central	1.9	-1.2	-3.1
Veolia East	2.9	-1.1	-4.0
Veolia Southeast	5.1	0.9	-4.2
WoC average	3.8	0.3	-3.5
Industry average	2.5	0.5	-2.0

Table 5 shows the change in price limits between our draft and final determinations. The industry average price limit has increased by 0.7% a year between our draft and final price limits. The increases for water only companies are much larger (1.4% a year) than for water and sewerage companies (0.6% a year). The greatest changes are for Bristol (2.1% a year) and Sutton & East Surrey (1.9% a year). The smallest change is for Bournemouth & West Hampshire at just 0.1% a year.

Table 5 Price limit changes from draft to final determinations

Annual average price limits			
	Draft determination average K	Final determinations average K	Difference between draft and final determination
Water and sewerage companies			
Anglian	0.2	0.5	0.3
Dŵr Cymru	-1.1	-0.8	0.3
Northumbrian	0.9	1.7	0.8
Severn Trent	-1.5	-0.6	0.9
South West	0.9	1.9	1.0
Southern	0.0	1.2	1.2
Thames	0.8	1.4	0.6
United Utilities	-0.6	-0.4	0.3
Wessex	0.1	1.2	1.1
Yorkshire	0.1	0.5	0.4
WaSC average	-0.1	0.5	0.6
Water only companies			
Bournemouth & W Hampshire	0.9	1.0	0.1
Bristol	-0.4	1.8	2.1
Cambridge	-1.9	-0.3	1.6
Cholderton	-1.6	0.0	1.6
Dee Valley	-0.4	0.5	0.9
Portsmouth	-3.4	-2.1	1.3
South East	0.0	1.8	1.9
South Staffs	-0.3	0.6	0.9
Sutton & East Surrey	-1.5	0.4	1.9
Veolia Central	-2.4	-1.2	1.2
Veolia East	-2.5	-1.1	1.4
Veolia Southeast	-0.4	0.9	1.3
WoC average	-1.1	0.3	1.4
Industry average	-0.2	0.5	0.7

The changes from our draft determinations relate to a number of factors.

- Higher levels of capital expenditure for some companies to deliver additional outputs (such as metering and sewer flooding).
- Additional schemes in the NEP.
- Increased expenditure on capital maintenance to ensure network serviceability is maintained.
- New information on external factors (such as the industrial demand for water, energy, business rates, and pension liabilities).
- Ensuring that there remain strong incentives to efficiency, which is rewarded appropriately, particularly in respect of CIS.

- A planned reassessment of relative efficiency for operating expenditure using the information in the 2009 June return.
- Clarification of company-specific issues.
- A reassessment of the balance of risk in light of new information and representations. We have included two further notified items: the first on bad debt, and the second on certain Environment Agency abstraction charges.

Individually, these had a small impact on the price limits. However, when taken together they increase average annual price limits from -0.2% to +0.5%. They have also had a more material affect for some companies as table 5 shows.

In total, the changes from draft determinations have increased the capital expenditure by £1.3 billion to £22.1 billion, compared with £24.2 billion in the final business plans. The average operating expenditure allowance has increase by £0.1 billion a year to £3.7 billion a year (£3.8 billion in the final business plans).

2.1.1 Making decisions on price limits

At each price review, we consider companies' proposals for price limits for the following five years. However, we also look for plans that are not unnecessarily constrained by the five-year period and are consistent with a longer-term view, and which offer best value for customers. For this price review, we expected the companies to set their five-year plans in the context of both their 25-year SDS and the statutorily based water resource management plans.

We looked for business plans that took a realistic and pragmatic view of the risks facing them and of the potential for becoming more efficient in the future. At the same time, companies had to put forward investment proposals that would satisfy new statutory requirements and deal with issues of concern to customers.

We have a duty to finance the functions of efficient companies. The price limits we have set allow each company to earn a return on their capital base and enable them to raise finance on reasonable terms. We believe the price limits will help an efficient company to deliver the right outcomes at the right time, and represent value for money for customers. We do not have a duty to support poorly run companies.

One of the most difficult issues for us as we set price limits, given the current economic and financial environment, is how to deal with uncertainty. Our preferred approach is to work to reduce uncertainty, making robust decisions on costs and outputs that we can include in price limits. In this way, customers can have confidence about future bills and investors can have a clearer view of the risks they may face. However, this is not always possible and, over time, we have developed mechanisms to address changes that would have a material impact on the ability of a company to finance its functions. We describe these and summarise our approach for this price review in section 5.3.

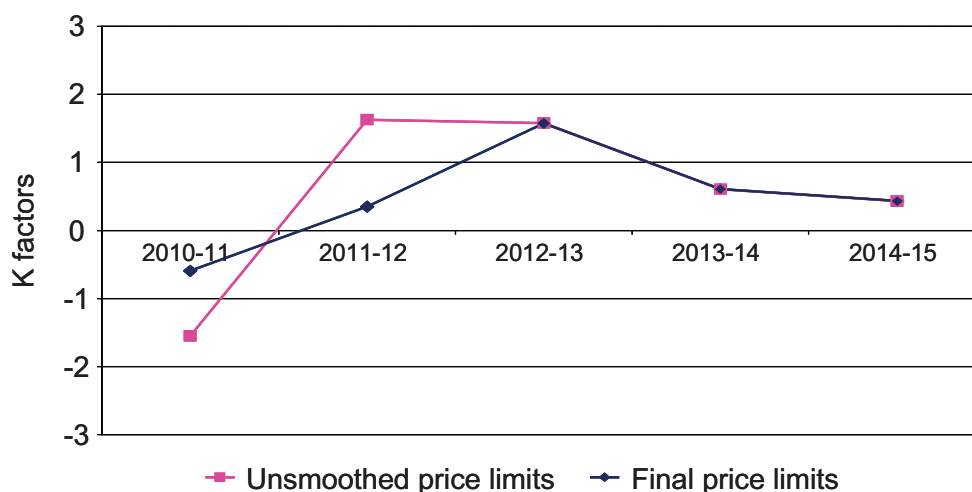
It is in customers' interests that price limits should only take account of investment proposals where there is reasonable certainty. Accordingly, our price limits do not take account of the adoption of private sewers, even though Government has promised legislation to bring about change in this area. Neither do price limits take account of the issues arising from the recently published UK Climate Impacts Programme (UKCIP) climate change scenarios. However, in both cases our overall approach will allow companies to take prompt action before the next price review when the implications of the new information become clear enough to support additional expenditure.

2.1.2 The profile of price limits

For all but three of the water and sewerage companies (Northumbrian, South West and United Utilities) and for four water only companies (Cambridge, Dee Valley, Sutton & East Surrey and Veolia Southeast) we have smoothed the early price limits (K factors). We have taken this step because we found some significant volatility between the first year, 2010-11 (which showed negative price limits), and 2011-12 (where price limits were mostly positive). These variations occur simply because the raw price limits reflect exactly the actual cost and expenditure assumptions for each year. There were many decreasing factors in the first year followed by high levels of investment in the next year.

This profile will also be exacerbated by the unusual trend in inflation where we anticipate deflation (negative RPI) in 2009, which flows through to customers' bills for 2010-11, followed by a return to positive inflation beyond (see section 5.11). Customers have frequently told us that they prefer bills that are as stable as possible (see chapter 3 on customer preferences). So, we have taken steps to smooth out these differences to provide a more even price limit profile. This has no impact on the overall bill to customers by 2015 or on the financial return to the companies concerned over the five-year period.

Figure 3 Industry price limits – smoothed and unsmoothed profiles



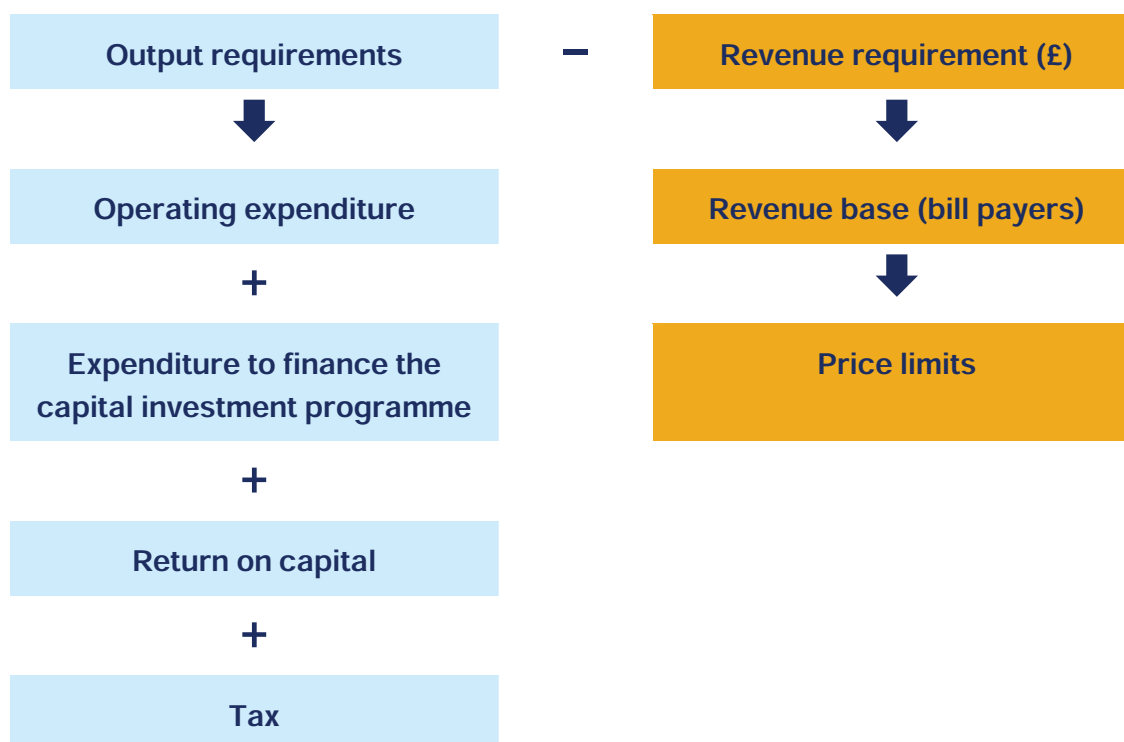
As part of its representations, CCWater asked us to take action to smooth price limits across the whole of the period for all companies, including countering the likely impact of inflation. We did not do this for three reasons.

- We believe that the profile of price limits (and bills) should follow the underlying profile of the change in costs.
- The pattern of inflation is expected to be unusual only in the first few years.
- Bills may end up higher at the end of the period if smoothed.

2.1.3 Approach to setting price limits

Figure 2 below shows how we follow a relatively simple approach to setting price limits. Essentially, we determine the level of revenue needed to deliver our view of each company's business plan. We then apply adjustments for performance related rewards or penalties. This figure becomes the 'revenue requirement'. We compare this to the forecast revenue and express the difference as a price limit. The annual price limit is the maximum by which a company can increase its overall prices in a particular year.

Figure 4 Approach to setting price limits



2.1.4 Price limits by service

Because the companies are managed as single units, at least at the strategic level, we do not set separate price limits for water and sewerage services. However, to allow the

customers of the water only companies to make comparisons, we have apportioned price limits between the water and sewerage services as shown in table 6.

Table 6 Indicative changes in water and sewerage charges 2010-11 to 2014-15

	Price limit for first year 2010-11 (%)			Cumulative price limits for four years 2011-12 to 2014-15 (%)		
	Price limit	Indicative		Price limit	Indicative	
		Water	Sewerage		Water	Sewerage
Water and sewerage companies						
Anglian	-0.7	-1.5	-0.3	3.4	5.7	1.9
Dŵr Cymru	-1.3	-3.5	0.4	-2.7	-2.8	-2.7
Northumbrian	5.0	7.9	1.1	3.7	5.6	1.3
Severn Trent	-1.0	4.1	-5.5	-2.1	-3.6	-0.7
South West	1.1	1.0	1.0	8.5	7.7	9.4
Southern	-0.7	1.6	-1.5	6.9	4.2	7.8
Thames	0.2	3.7	-3.5	6.9	-1.9	16.6
United Utilities	-4.3	1.7	-8.8	2.6	0.9	4.2
Wessex	0.3	4.5	-2.0	5.7	13.4	1.7
Yorkshire	-1.2	-2.5	-0.1	3.5	0.9	5.8
WaSC average (weighted)	-0.8	1.9	-3.0	3.2	1.2	5.0
WoC average (weighted)	1.6	1.6		0.0	0.0	
Industry average (weighted)	-0.6	1.8	-3.0	3.0	1.0	5.0

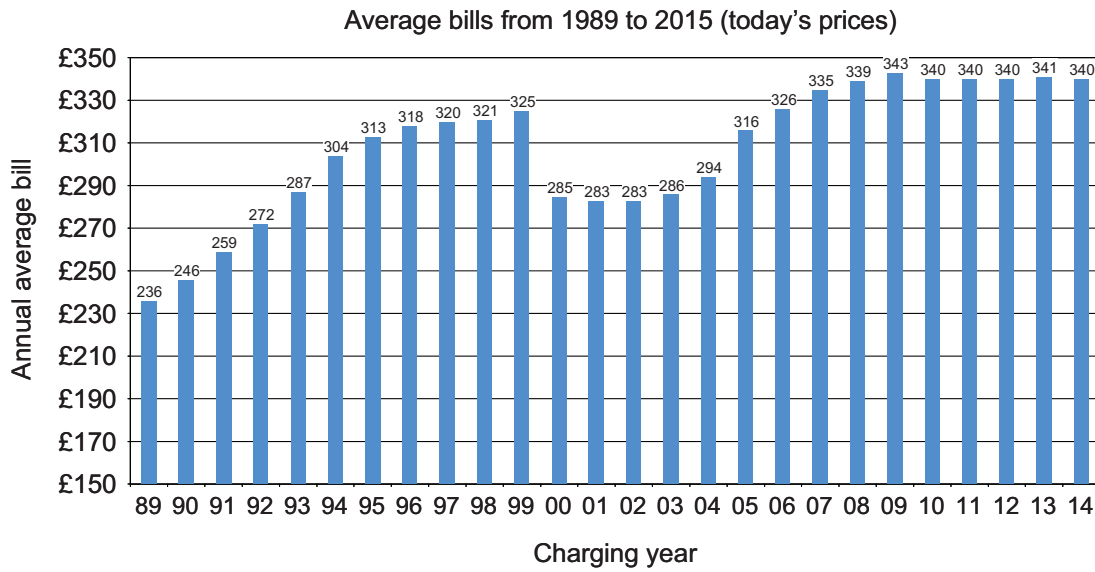
The sewerage service price limits for each company are generally lower than for the water service in the first year. We have set out the reasons for this in chapters 4 and 5 on our cost and financial assumptions.

2.2 Bills to customers

Price limits are not the same as bills to customers. The latter reflect the actual nature of a company's customer base, in particular the proportion of water supplied to household and non-household customers. They also reflect the proportion of household customers who have a metered water supply.

Figure 3 shows how average (that is, combined metered and unmetered household) bills have changed since privatisation. It shows that bills on average are broadly stable over the next five years, subject to inflation. However, individual bills will vary considerably between companies according to whether the customer has a meter.

Figure 5 Average bills since privatisation



2.2.1 Average household bills

Table 7 shows the impact of our final determinations on the average bills of customers of each company. It shows that there is no change (at £162) in the average bill for water over the period, and a reduction of £3 from £181 to £178 for sewerage.

For the water service, Portsmouth has the lowest average household bill in 2014-15 at £87, while Wessex has the highest at £224. For the sewerage service, South West has the highest average bill at £278, with Thames the lowest at £133.

Table 7 Expected average household bills¹

Average annual household bills (£) ²								
	2009-10		2014-15		Change			%
	Water	Sewerage	Water	Sewerage	Water	Sewerage	Total	
Water and sewerage companies								
Anglian	172	216	159	202	-13	-15	-28	-7
Anglian Water ³	173	216	160	202	-13	-15	-28	-7
Hartlepool Water	127		126		-1		-1	-1
Dŵr Cymru	171	233	155	219	-16	-13	-29	-7
Northumbrian ³	147	167	163	168	16	1	17	6
Northumbrian area	131	167	144	168	13	1	14	5
Essex & Suffolk area	169		190		21	0	21	13
Severn Trent	152	152	151	140	-1	-12	-13	-4
South West	207	283	205	278	-1	-5	-6	-1
Southern	127	246	138	255	11	9	20	5
Thames	183	121	180	133	-2	12	10	3
United Utilities	169	205	172	192	3	-12	-9	-3
Wessex	202	210	224	200	22	-10	12	3
Yorkshire	154	178	149	183	-4	6	1	0
WaSC average (weighted)	165	181	165	178	0	-2	-3	-1
Water only companies								
Bournemouth & W Hampshire	133		134		1		1	1
Bristol	157		168		11		11	7
Cambridge	114		116		2		2	1
Cholderton	188		188		0		0	0
Dee Valley	128		130		2		2	2
Portsmouth	93		87		-6		-6	-7
South East	169		174		5		5	3
South Staffs	124		126		2		2	2
Sutton & East Surrey	166		167		1		1	1
Veolia Central	156		146		-10		-10	-6
Veolia East	169		160		-10		-10	-6
Veolia Southeast	185		181		-4		-4	-2
WoC average (weighted)	148		148		-1		-1	-1
Industry average (weighted)	162	181	162	178	0	-2	-3	-1

Notes:

1. This table is quoted in 2009-10 basket year prices.
2. The actual impact on customers' household bills will also be governed by companies' approved charges schemes.
3. We set a single price limit for Anglian and Northumbrian. The bills set out for all the regions (that is, including Hartlepool and Essex & Suffolk) for water are consistent with the overall price limit and assume an equal application of K in each sub-area, but the companies may apply the price limit differentially to reflect differences in cost drivers.

The largest increases in bills over the period are at Wessex (£22) for the water service and Thames (£12) for the sewerage service. The largest fall in bills for water is £16 (Dŵr Cymru) and for sewerage £15 (Anglian).

These compare with the companies' proposals set out in table 8, which contained proposals averaging bill increases of 9% (£31). However, some customers could have faced even higher bills; for example, those of Sutton & East Surrey (who receive their sewerage service from Thames), would have faced, on average, combined bills that would have increased by £70.

Table 8 Business plan bill proposals

	2009-10		2014-15		Change			
	Water	Sewerage	Water	Sewerage	Water	Sewerage	Total	%
Water and sewerage companies								
Anglian ¹	172	216	183	218	10	1	12	3%
Hartlepool	127		145		18		18	14%
Dŵr Cymru	171	233	168	235	-3	3	0	0%
Northumbrian	147	167	174	183	28	16	43	14%
Northumbrian area	131	167	157	183	26	16	42	14%
Essex and Suffolk area	169		206		38		38	20%
Severn Trent	152	152	169	149	16	-4	13	4%
South West	205	283	215	302	10	19	29	6%
Southern	131	249	152	274	22	25	47	12%
Thames	183	121	210	146	27	25	52	17%
United Utilities	171	206	187	217	16	11	28	7%
Wessex	202	210	211	223	9	13	25	6%
Yorkshire	154	178	160	192	6	15	21	6%
WaSC average	166	181	182	194	16	13	29	8%
Water only companies								
Bournemouth & W Hampshire	133		158		25		25	19%
Bristol	157		202		46		46	29%
Cambridge	121		129		8		8	7%
Dee Valley	128		140		12		12	9%
Portsmouth	93		105		12		12	13%
South East	169		208		38		38	23%
South Staffs	124		145		21		21	17%
Sutton & East Surrey	165		210		45		45	27%
Veolia Central	160		174		13		13	8%
Veolia East	175		199		25		25	14%
Veolia Southeast	197		226		31		29	16%
WoC average	150		176		25		25	17%
Industry average	163	181	181	194	18	13	31	9%

Note:

1. We did not require Anglian to provide a bill for the Anglian area only as part of its business plan submission. This is for the average bill for both regions.

2.2.2 Typical household bills for metered and unmetered customers

Table 9 shows the changes in the typical bill for each company for each category over the period covered by our final determinations.

Table 9 Change in typical metered and unmetered household bills

	Household bills (£)				change	
	2009-10		2014-15		Metered	Unmetered
	Metered	Unmetered	Metered	Unmetered		
Water and sewerage companies						
Anglian	348	470	336	533	-3%	13%
Dŵr Cymru	292	456	276	449	-5%	-2%
Northumbrian	267	335	280	375	5%	12%
Severn Trent	280	316	267	307	-5%	-3%
South West	401	723	407	935	1%	29%
Southern	324	412	352	422	9%	2%
Thames	280	316	292	343	4%	9%
United Utilities	344	398	334	413	-3%	4%
Wessex	358	469	369	565	3%	20%
Yorkshire	293	364	293	399	0%	10%
WaSC average (weighted)	314	370	313	390	0%	5%
Water only companies						
Bournemouth & W Hampshire	131	150	132	169	1%	12%
Bristol	138	166	146	194	5%	17%
Cambridge	113	129	110	135	-3%	5%
Dee Valley	109	146	109	154	0%	5%
Portsmouth	88	94	78	87	-11%	-8%
South East	141	197	145	227	3%	15%
South Staffs	122	126	120	138	-2%	10%
Sutton & East Surrey	149	170	142	181	-5%	7%
Veolia Central	142	169	133	162	-7%	-4%
Veolia East	156	202	144	206	-8%	2%
Veolia Southeast	165	244	174	253	5%	4%
WoC average (weighted)	137	159	135	164	-2%	3%
Industry average (weighted)	312	367	311	385	0%	5%

This table shows the typical bills that customers might expect to see as a result of our determinations. They show how much customers could expect to pay if they have either a water meter and use an average amount of water, or have an average rateable value – assuming that they do not change their behaviour or how they are charged. The changes in these bills are different from those presented in table 5 as that table calculates the overall change in all charges taking account of all customers' characteristics – not just the averages.

The rate at which unmetered customers opt for a meter has a significant effect on typical metered and unmetered bills. This happens because optional metering unwinds the cross-subsidy that exists within the group of unmetered customers in an uneven way. Those unmetered customers in properties with high rateable values, but who use relatively little water, pay more than it costs to provide their water and sewerage services. Correspondingly, unmetered customers with lower rateable values and higher water use pay less than the costs of the services they receive. When low-use customers with high rateable values opt for a meter, their bills fall to reflect more closely the cost of the service they receive. It would be unfair for such customers to continue to subsidise the remaining unmetered customers, so unmetered charges have to increase. Our regulatory mechanisms make sure that this happens.

The typical bills in the table above take account of switching rates – but they could change. We think that all customers with an unmetered supply should seriously consider whether opting for a meter would be the best way to pay for their water and sewerage services in the future. The table shows some striking figures – particularly in the level of bills for unmetered customers where levels of optional metering are high, such as South West. There, unmeasured customers could have typical unmetered bills of £935 by the end of the period.

2.2.3 Components of the average bill

Average bills have three key financial components.

- **Operating costs** – the day-to-day costs of running the business.
- **Capital charges** – the costs of improving and maintaining companies' assets, such as treatment works, spread over the life of the assets.
- **The return on capital** – interest payments, profit (including dividends) and tax.

Table 10 shows how these output categories have contributed to the key financial components of the average industry bill in 2009-10. Table 11 shows the same for 2014-15. We have set this out for 2009-10 and for 2014-15 to show how the picture changes over the five-year price review period. These tables are 'snapshots' and represent the start and finish points of this price review. They illustrate both the continuing and cumulative impact on bills of the additions required in each price limit period.

Each time we set price limits the costs associated with sustaining the improvements made in the previous period are rolled up into the 'maintaining existing services and serviceability' output category. Similarly, at the next price review the 'maintaining existing services and serviceability' output category will incorporate the ongoing costs of sustaining all the improvements required in the five years from 2010 to 2015, as well as sustaining the improvements delivered since privatisation.

Table 10 Components of the 2009-10 average bill

Output categories	Cost component drivers			Total (£)	% of total
	Operating costs (£)	Capital charges (£)	Return on capital (including tax) (£)		
Maintaining existing services and serviceability including sustaining all improvements delivered in 1990-2005	115	83	101	299	87%
Plus additions during 2005-10 to:					
1. Maintain and enhance security of supply	2	4	5	11	3%
2. Deliver all the required improvements to drinking water quality and the water environment	3	10	17	30	9%
3. Deliver all the required service improvements	0	1	2	3	1%
Total bills	120	98	125	343	
% of total	35%	29%	36%		

Table 11 Components of the 2014-15 average bill

Output categories	Cost component drivers			Total (£)	% of total
	Operating costs (£)	Capital charges (£)	Return on capital (including tax)(£)		
Maintaining existing services and serviceability including sustaining all improvements delivered in 1990-2010	123	94	97	314	92%
Plus additions during 2010-15 to:					
4. Maintain and enhance security of supply	0	3	5	8	2%
5. Deliver all the required improvements to drinking water quality and the water environment	1	6	9	16	5%
6. Deliver all the required service improvements	0	1	1	2	1%
Total bills	124	104	112	340	
% of total	36%	31%	33%		

Table 1 shows the drivers of the £3 decrease in the average household bill over the five years to 2014-15 from £343 to £340. Table 10 is consistent with this, but allocates our efficiency assumptions to specific drivers. For example, the increase in bills because of the costs of maintaining and enhancing security of supplies is £9 in table 1 before we

applied the efficiency improvement factors, which reduce the net impact on costs to the £8 shown in table 11.

Over time, the operating cost component has risen. This reflects the immediate impact of real world challenges facing the companies such as higher power, business rates and pension costs. At the same time, the need to maintain the expanding asset base leads to higher capital charges. However, our lower assumption on the cost of capital is the most significant driver of the reduction in the proportion of the bill devoted to the return on capital.

2.3 Affordability

Our customer research in autumn 2008 showed that most customers had no difficulty paying their water bills. However, a significant proportion (14% in England and 6% in Wales) said they sometimes found it difficult to pay their bills on time. Economic conditions have remained difficult. We have therefore been particularly careful to ensure that customers are getting value for money and that we take account of their views on companies' proposed business plans and prices.

Our price limits will result in lower bills than the companies' proposed. For a number of companies, our price limits will lead to average bills that are lower than they are now for all or part of the next price review period. Customers in some of the areas where bills are high and incomes relatively low – including Wales and south-west England – will see real falls in bills for the first time since 1999. This will help to ease the pressure on those struggling to pay.

2.4 The infrastructure charge

At price reviews, we set infrastructure charge limits for connecting household premises to water or sewerage services for the first time. The infrastructure charge provides a contribution towards the costs of developing local networks to serve new customers. Companies can levy an infrastructure charge, as well as the direct costs of making new connections.

We have set an infrastructure charge limit of just over £297 for both the water and sewerage services in 2010-11. In the absence of a compelling reason for change, this is the same charge in real terms as we set at the last price review in 2004, but indexed by RPI. Charges for future years will increase in line with RPI.

2.5 Setting price limits in the future

We are committed to improving the role that market mechanisms play in providing customers with better services and value in the future. We are currently working with the industry on an accounting separation project. We intend this to lead to a further project looking at the deconstruction of price limits into indicative subsidiary price limits for each of the business units we identify. This could provide a basis for formally setting separate price limits for each business unit.

3. The right outcome for customers



This chapter outlines the package of outputs included in our price limit assumptions and explains how we have reached our conclusions in each area. It also explains how we have:

- rewarded customer service performance in price limits; and
- worked to understand and take account of customers' views.

3.1 Understanding consumers' preferences

Each company should aim to deliver a service that reflects consumers' preferences. However, in the absence of competition, customers cannot demonstrate their preferences on quality, and price by choosing between alternative suppliers and alternative packages. Accordingly, each company must find other ways to understand what its consumers want and are prepared to pay for. In turn, we need to understand consumers' priorities and preferences to inform our judgements.

3.1.1 Finding out what consumers want

We worked with the following stakeholders on a three-stage consumer consultation process.

- The Consumer Council for Water (CCWater).
- The Department for Environment, Food and Rural Affairs (Defra).
- The Welsh Assembly Government.
- The Drinking Water Inspectorate (DWI).
- The Environment Agency.
- Natural England.
- Water UK.

Stage 1: In 2007, each company carried out consumer research with input from CCWater to inform and develop its longer-term strategic direction statement.

Stage 2: CCWater led a joint stakeholder regional deliberative consumer research project between October and December 2007. The results informed each company's draft business plan proposals.

Stage 3: After each company submitted its draft business plan, we carried out joint consumer research between September and November 2008, working with other stakeholders. This explored consumers' views on their company's proposals, including the acceptability of the proposed outputs

and bill changes. The results and further work by some companies informed the final business plans, and our judgements on them.

3.1.2 What consumers said they wanted

The key message to come out of the 2007 deliberative research (stage 2) was that customers wanted an efficient, safe, reliable water supply at a reasonable price now and in the future, and that everything else was markedly less important.

The 2008 survey (stage 3) covered more than 6,000 consumers in England and Wales; it showed that most customers (86%) were satisfied with current water and sewerage services. Almost two-thirds (64%) of customers stated that the current water and sewerage service was good value for money.

As part of the research, we asked customers (those responsible for paying bills for water and sewerage services) what best described their approach to paying. Most (85%) said that they did not find it difficult to pay their water and sewerage bills on time. However, 11% stated that they usually paid on time, but doing so could be difficult.

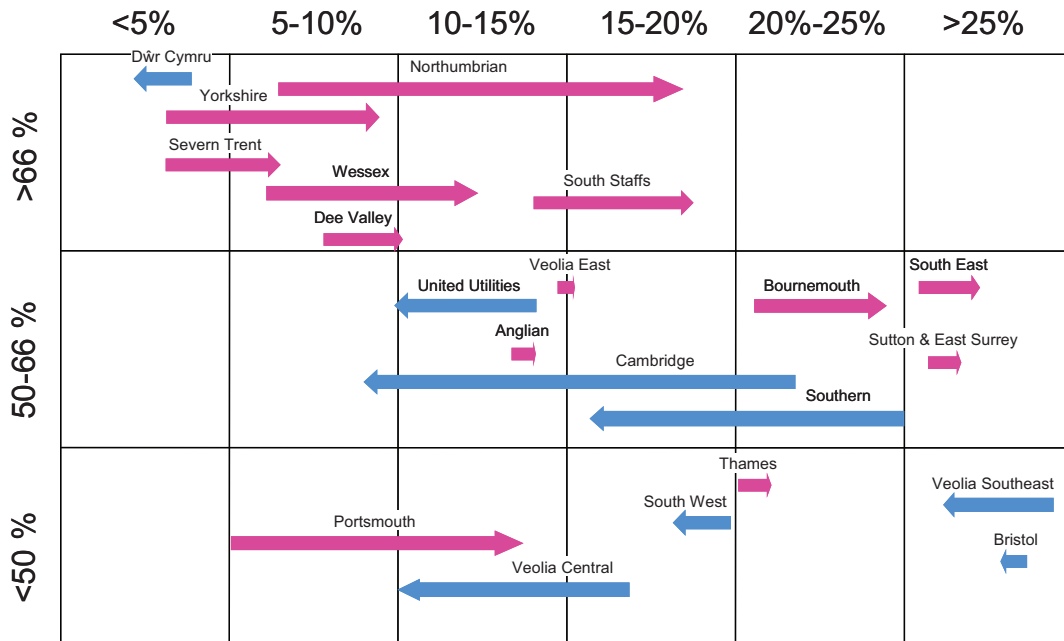
Most companies' draft business plans were acceptable to the majority of their customers. When provided with a short description of the benefits and costs in draft business plans, most customers (64%) thought that the combined water and sewerage plans were acceptable. Even so, just under a quarter of customers found them unacceptable overall, and 7% found them "completely" unacceptable. There was significant variation at the company level; in particular, customers whose proposed overall bill impact/overall percentage bill change was lowest (£20 or less, or 5% and less) were more accepting of their company's overall plan.

Most customers (81%) stated that they would prefer to see "bills change steadily throughout the period, so that they did not see big changes from year to year" rather than bills that fluctuated every year, or that had one big step-up and then remained at that level. Customers expressed the same view when we last set price limits in 2004.

3.1.3 How companies responded to the results of the consumer research

Figure 6 shows the degree of consumer acceptability on the vertical scale measured against the increase in bills proposed in companies' draft and final business plans. A red arrow indicates that bill proposals rose between draft and final plans; a green arrow that proposals reduced. The length of the arrow indicates the scale of the change.

Figure 6 Consumer acceptability and proposed price limit increases



Each company received the information from the joint consumer research project in time to use when developing and finalising its business plan. Most companies found that the results were in line with expectations. Figure 6 shows that there does seem to have been some response by companies to the consumer research.

A few companies – notably Southern and Cambridge – did reduce the bill impacts of their final business plans, particularly where there was a low level of acceptability for the draft business plans. However, it also seems that those with higher levels of acceptability felt able to increase the impact of their proposals. We were somewhat concerned by this response given that at the time the economic climate was continuing to worsen (and most companies emphasised the impact of this on their costs in their final business plans). We believed that all companies really needed to reconsider their proposals in light of the circumstances that their customers were facing.

3.1.4 How we have taken account of consumers' views

We have used the results from the range of consumer research and cost-benefit analysis (CBA) to help to inform our judgements in setting price limits. We have challenged all aspects of companies' plans to make sure that they are delivering value for money and are consistent with consumers' priorities. Where consumers expressed limited support for their companies' draft business plans, we have looked carefully at the justification for additional discretionary expenditure.

In October 2009, CCWater published the results of its independent research into our draft determinations. The final report¹ of CCWater's research concluded that more than four-fifths of respondents found our draft determinations acceptable. More than two-thirds thought the price limits were affordable.

We have also re-profiled the price limits for a number of companies for the first two years. This is to reduce the volatility of price limits and bills.

3.1.5 Customer service and the overall performance assessment

Our current incentive mechanisms include a performance-related adjustment to prices. A company that scores well on the overall performance assessment (OPA) can charge its customers slightly more. Those with poorer performance must charge slightly less. The OPA-related price limit adjustments in these final determinations reflect performance during the five years 2004-05 to 2008-09.

As set out in our [methodology paper](#) and as in previous price reviews, we have set the range of potential price limit adjustments from +0.5% to -1.0%. We have continued to use both comparative and absolute assessments of company performance. We compare the absolute performance of each company using the percentage of the maximum achievable score and the same graduated range of price adjustment bands. The comparative assessment uses graduated performance bands set around mean performance. We have compared the water and sewerage companies with the sewerage, water and customer services OPA five-year mean. The water only companies are compared with the five-year mean for water and customer services OPA for all 21 companies.

Our OPA price adjustments are set out in table 12.

We have considered company-specific circumstances. Where a single element of the assessment materially affected a company's performance or where a company score was very close to an adjustment band boundary, we considered carefully what adjustment would be reasonable. For example, we took account of the impact of hosepipe restrictions and major supply interruptions caused by extreme weather in some companies. We have identified affected companies in the table.

To avoid penalising a company twice for the same failure we also checked for any overlaps where we had used the performance data for OPA adjustments and for other decisions such as shortfalls or financial penalties. Although there were some cases where performance data overlapped, no company was disadvantaged.

¹ [Customers' Views on Ofwat's 2009 Draft Determinations.](#)

Table 12 OPA price limit adjustments

Five-year OPA score (as percentage of maximum achievable score)	Company	OPA incentive – price limit adjustment
99.9%	Veolia East	0.5
99.3%	Cambridge	0.5
98.8%	South Staffs*	0.4
98.5%	Bournemouth & W Hampshire	0.3
98.2%	Portsmouth	0.3
97.2%	Bristol	0.2
95.7%	Veolia Southeast*	0.1
95.7%	Dee Valley	0
92.9%	Veolia Central	-0.1
92.4%	Sutton & East Surrey*	-0.1
92.2%	South East*	-0.1
95.0%	Wessex	0.2
93.4%	Anglian	0.2
91.9%	Dŵr Cymru	0.1
91.8%	Yorkshire	0.1
88.0%	South West*	-0.1
86.8%	Thames	-0.2
84.9%	Severn Trent*	-0.3
84.6%	Southern*	-0.3
82.5%	United Utilities	-0.5
81.7%	Northumbrian	-0.5

Note:

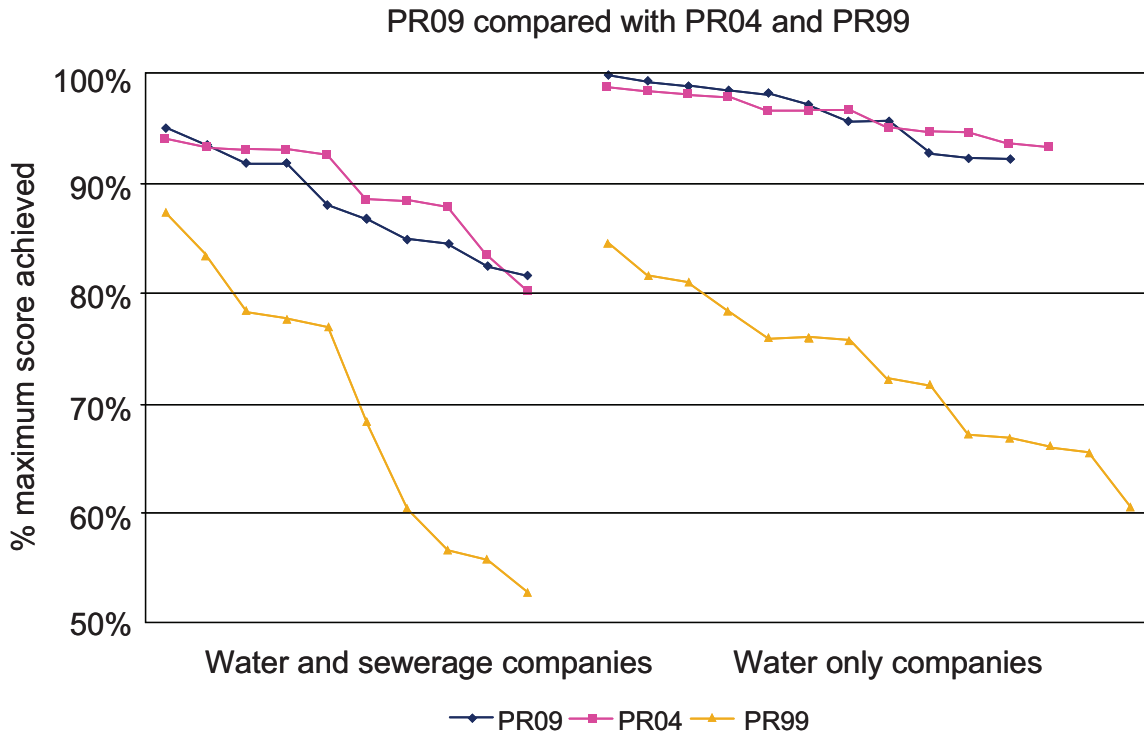
* Companies where we have taken account of company-specific or boundary issues.

In their comments on our draft determinations, some companies argued for better incentive adjustments. These companies suggested changes to our approach to improve rewards:

- for the water and sewerage companies relative to water only companies;
- for companies whose performance had improved since the last price review; and
- for particular water only companies by comparing them to the water only company average only.

We consider our approach remains appropriate. Figure 7 shows that, although individual companies may have improved, the sectors have not improved their absolute performance scores since the last price review. We therefore consider it reasonable to apply lower rewards for delivering the same absolute performance than at the last price review. Our comparative assessment strengthens the rewards or adverse effect of performing better or worse than comparable companies.

Figure 7 OPA performance comparison



CCWater argued that companies with high levels of complaints, which had provided particularly poor customer service, should receive more negative price adjustments. We set out the weight of different elements within the overall score in 2004. While we recognise CCWater’s concerns, it would not be appropriate to change our approach retrospectively.

In August 2009, we consulted on our proposals for a new service incentive mechanism, which would use new measures of consumer experience and replace the OPA for the period 2010-14. Our conclusions and a summary of responses are available on our website.

3.2 What the investment programme will deliver

The companies set out their proposals for capital investment to maintain service and deliver improvements in their final business plans. We considered these in light of the guidance issued by both Defra and the Welsh Assembly Government. We have worked with the appropriate quality regulators (principally the DWI, the Environment Agency and Natural England) to make sure that each company’s investment proposals deliver the required outcomes in drinking water quality and environmental performance. We have also considered the views of customers on proposals to improve service.

Our price limits will enable each company to:

- protect and maintain its asset systems, and meet existing statutory and regulatory standards to safeguard current essential services for consumers and the environment;
- reduce sewer flooding risks, where appropriate;
- maintain security of supply and meet new demands for connections to its networks;
- deliver specified service improvements to meet the requirements of the quality regulators. This includes measures identified in the NEP and the improvements to drinking water quality supported by the DWI; and
- put in place identified service improvement measures, including improvements to drinking water consumer acceptability and to resilience to extreme events.

We have reviewed decisions we made at our draft determinations in light of the representations we received from companies, quality regulators, and other stakeholders. In the supply-demand, quality improvements and service level enhancement area these were, by their nature, quite company specific, we have explained our actions in the individual company-specific feedback on our determinations.

We expect companies to continue working to drive value and innovation in delivering the agreed outcomes for drinking water and environmental quality over 2010-15, in consultation with quality regulators as appropriate. We will ensure that our approach to judging output delivery does not stifle the identification of more innovative approaches.

3.2.1 Maintaining the asset networks

We expect all companies to maintain their asset networks so that they are capable of maintaining the flow of services to consumers now and into the future. We will monitor and regulate this by measuring a basket of serviceability indicators for all assets, which include asset performance indicators, water quality compliance, environmental compliance and consumer service indicators. We will assess trends in these 'serviceability' indicators to determine if stable serviceability is being maintained. We assess each company's serviceability in the sub-service areas using four descriptors: 'improving', 'stable', 'marginal' and 'deteriorating'.

We expect all companies to deliver and maintain 'stable' serviceability for all of their asset systems throughout 2010-15 and beyond. In delivering this, companies must monitor, manage and maintain assets so that the serviceability indicators remain within a set range of control limits around a central reference level. This serviceability approach underpins all aspects of maintaining service for consumers.

Table 13 shows our most recent assessments of serviceability for each company. The overall serviceability assessment for the industry as a whole is stable, with only six sub-services across all of the companies classified as marginal. A marginal assessment means we have some concerns that serviceability trends are moving in the wrong direction.

Table 13 Water and sewerage serviceability assessments for 2008-09¹

	Water infrastructure	Water non-infrastructure	Sewerage infrastructure	Sewerage non-infrastructure
Water and sewerage companies				
Anglian	Stable	Stable	Stable	Stable
Dŵr Cymru	Stable	Marginal	Stable	Stable
Northumbrian	Stable	Stable	Marginal	Stable
Severn Trent	Stable	Improving	Stable	Stable
South West	Stable	Stable	Stable	Stable
Southern	Stable	Marginal	Stable	Stable
Thames	Stable	Improving	Stable	Stable
United Utilities	Stable	Stable	Stable	Marginal
Wessex	Stable	Stable	Stable	Stable
Yorkshire	Stable	Stable	Stable	Stable
WaSC assessment	Stable	Stable	Stable	Stable
Water only companies				
Bournemouth & W Hampshire	Stable	Stable		
Bristol	Stable	Stable		
Cambridge	Stable	Stable		
Dee Valley	Stable	Stable		
Veolia Southeast	Stable	Stable		
Portsmouth	Stable	Stable		
South East	Stable	Stable		
South Staffs	Stable	Stable		
Sutton & East Surrey	Stable	Stable		
Veolia East	Stable	Stable		
Veolia Central	Marginal	Marginal		
WoC assessment	Stable	Stable		
Industry assessment	Stable	Stable		

Note:

1. Assessment is based on a full analysis of 2009 June return assessments.

At the last price review (in 2004), there were 14 out of 64 sub-services classified as marginal or deteriorating (where we had stronger concerns) at this stage. We have worked closely with the companies since then, with most responding positively by delivering action plans and improved serviceability outcomes.

In MD212, 'Asset management planning to maintain serviceability' (February 2006), we said that where companies are unable to demonstrate that they have delivered stable serviceability according to the timetable set out in their determinations, our starting presumption will be a shortfall in service delivery. The shortfall process ensures that customers do not pay for outputs that companies have not delivered.

Accordingly, we have applied shortfall adjustments for two companies with 'marginal' serviceability assessments (Veolia Central for water infrastructure and Dŵr Cymru for water non-infrastructure). We have not applied shortfalls for other marginal sub-services because:

- there is an overlap with other shortfall adjustments (Northumbrian for sewerage infrastructure);
- the marginal assessment reflects sampling or reporting issues and not capital maintenance-related concerns (Southern and Veolia Central for water non-infrastructure); and
- there are clear improvements in performance over a period of nearly two years, which will not be reflected until June return 2010 (United Utilities for sewerage non-infrastructure).

Companies with any sub-service that we currently have assessed as less than stable (marginal or deteriorating) must achieve stable serviceability and demonstrate this in 2012.

In [‘Capital expenditure for 2010-15: Ofwat’s view on companies’ draft business plans’](#) (December 2008), we set out to each company the measures and reference levels that we expected them to achieve as a minimum throughout 2010-15. The companies responded to these reference levels in their final business plans and reviewed the capital maintenance investment they required to maintain stable serviceability. We have reviewed companies’ proposed reference levels as part of our assessment of the final business plans and representations; we have determined limits that are appropriate for 2010-15.

In order to monitor companies’ performance in maintaining water quality in distribution we have introduced two additional serviceability measures within the water infrastructure area (in consultation with the DWI). These measures are:

- discolouration contacts for every 1,000 of the population; and
- turbidity, iron and manganese index (TIM).

The DWI will collect data for both of these measures and will provide it to us for assessment through the MD109 protocol.

We expect each company to at least maintain its current performance, or where relevant, restore performance to expected levels throughout 2010-15 and beyond. Where we have made a specific price limit assumption to make a stepped improvement in service, we expect a company to deliver this within the timetable set out for that company.

We will monitor each company's performance against these reference levels and where relevant, we will shortfall companies for non-delivery. Failure could lead to a shortfall up to the value of 50% of the capital maintenance expenditure assumed at the previous price review for the relevant sub-service and the associated financing costs. The amount of shortfall that we judge appropriate in respect of serviceability will be proportionate to the nature and the degree of failure.

3.2.2 Sewer flooding

Each company has a duty to provide, improve and extend a system of sewers to ensure its area is drained effectually and should maintain their sewer networks to achieve this. It is the companies' responsibility to respond to customers' sewer flooding problems, investigate possible solutions and prioritise investment to deliver the expected outputs.

Our final determinations include significantly more sewer flooding outputs with increased benefits than were assumed in draft price limits. We have responded to the prominence of this issue in the representations on our draft determinations, and where appropriate pressed companies to clarify benefits or commit to delivering increased outputs.

We have also responded to these concerns by looking more closely at the proposed costs and benefits – using new information wherever possible. This has allowed us to increase the outputs required from the companies for a modest increase in price limits.

All companies should continually review, monitor and prioritise sewer flooding investment as they develop solutions to existing problems and identify new ones. They should not see business plan proposals or price limit decisions as a barrier to the use of new information and the development of innovative solutions in the best interest of customers.

Table 14 sets out our assumptions on outputs for each company in the final price limits together with those in the companies' final business plans

Table 14 Output assumptions for sewer flooding for 2010-15

Company	Company proposal				Final determinations			
	No. of problems solved at risk of flooding internally at least once in 10 years ¹	No. of problems solved at risk of flooding internally at least once in 20 years ²	No. of external flooding problems solved ³	Properties and areas receiving mitigation	No. of problems solved at risk of flooding internally at least once in 10 years	No. of problems solved at risk of flooding internally at least once in 20 years	No. of external flooding problems solved	Properties and areas receiving mitigation
Anglian	153	60	295	210 int 100 ext	190	52	246	210 int 100 ext
Dŵr Cymru	203	55	203	10 int	219	65	310	10 int
Northumbrian	1,135	0	0	221 int	1,135	0	0	221 int
Severn Trent	632	603	1,031	795 int 365 ext	511	374	678	525 int 250 ext
South West	87	4	127	30 int 5 ext	87	4	127	30 int 5 ext
Southern	161	139	169	400 int 100 ext	146	127	21	400 int 100 ext
Thames	1,882 ⁴	144	1,097	648 int 108 ext	1,707	105	676	648 int 108 ext
United Utilities	456	277	326	775 int 426 ext	565	186	315	500 int 426 ext
Wessex	200	138	170	40 int 60 ext	200	138	170	40 int 60 ext
Yorkshire	590	97	163	0	517	51	132	0
Industry total	5,499	1,517	3,581	3,129 int 1,164 ext	5,277	1,102	2,675	2,584 int 1,049 ext

Notes:

1. This includes work to address existing and forecasts of newly emerging problems.
2. Some of these outputs may be associated with schemes that solve high risk or external problems.
3. Some of these outputs may be associated with schemes that solve internal problems.
4. This includes 406 solutions double counted in the programme to address known problems.

We continue to include work for properties flooded at least once in 20 years and external flooding issues. For those properties that experience flooding, but where permanent solutions are not cost-beneficial, we have included a significant mitigation programme. This includes fitting ‘flap valves’ and other measures to prevent flooding and mitigate the impact on properties should the sewers become overloaded (2,584 internally flooded properties and 1,049 areas at risk of external flooding).

Table 15 shows how our decision will affect the sewer flooding risk registers, with an overall net reduction in the properties in the highest risk category of 1,368. In our draft determinations, we said that our assumptions would enable companies to remove 1,539 properties from the high-risk registers. This was an overstatement – we have since found that Thames double counted more than 400 properties in its proposed programme to address known sewer flooding problems. When this is taken account of, our new assumptions deliver a larger real improvement than in our draft determinations.

Table 15 Assessment of proposals to reduce risk of sewer flooding for 2010-15

Company	DG5 register position in 2010	Company requested additions	Ofwat calculated additions	Total number of funded solutions	Net reduction in the high-risk registers
Anglian	300	88	88	190	102
Dŵr Cymru	219	180	180	219	39
Northumbrian	768	700	700	1,135	435
Severn Trent	540	585	445	511	66
Southern	213	105	105	146	44 ¹
South West	52	70	70	87	17
Thames	1,620	1,848	1,210	1,707	497
United Utilities	975	456	456	565	109
Wessex	110	200	200	200	0
Yorkshire	212	525	458	517	59
Industry	5,009	4,757	3,912	5,277	1,368

Note:

1. Includes the removal of three properties where no funding was requested.

We have also made different assumptions about the number of new problems that will arise between 2010 and 2015 for some other companies. We made changes where we have received new information about the rate of additions or we did not feel the rate proposed by the company was justified by past data.

For our final determinations, we have assumed activity to alleviate flooding at 1,690 properties that are on the high-risk registers at the start of 2010. Some of these solutions offset new additions that are added to the register towards the end of 2010-2015 and others will compensate for problems that are not cost-beneficial to solve and would otherwise lead to the registers increasing over the next five years.

Our final determination includes 5,277 solutions for properties at a high risk of flooding. The price limit assumptions enable companies to remove 1,368 properties from the high-risk registers. This is a 27% reduction in the register from the forecast position of about 5,000 properties at March 2010, leaving 3,641 on registers with a risk of flooding at least than once in ten years.

We have also assumed that companies will provide mitigation for at least 2,584 properties that suffer from sewer flooding. This will help provide protection for properties where there is no cost-beneficial solution or where no immediate solution is available.

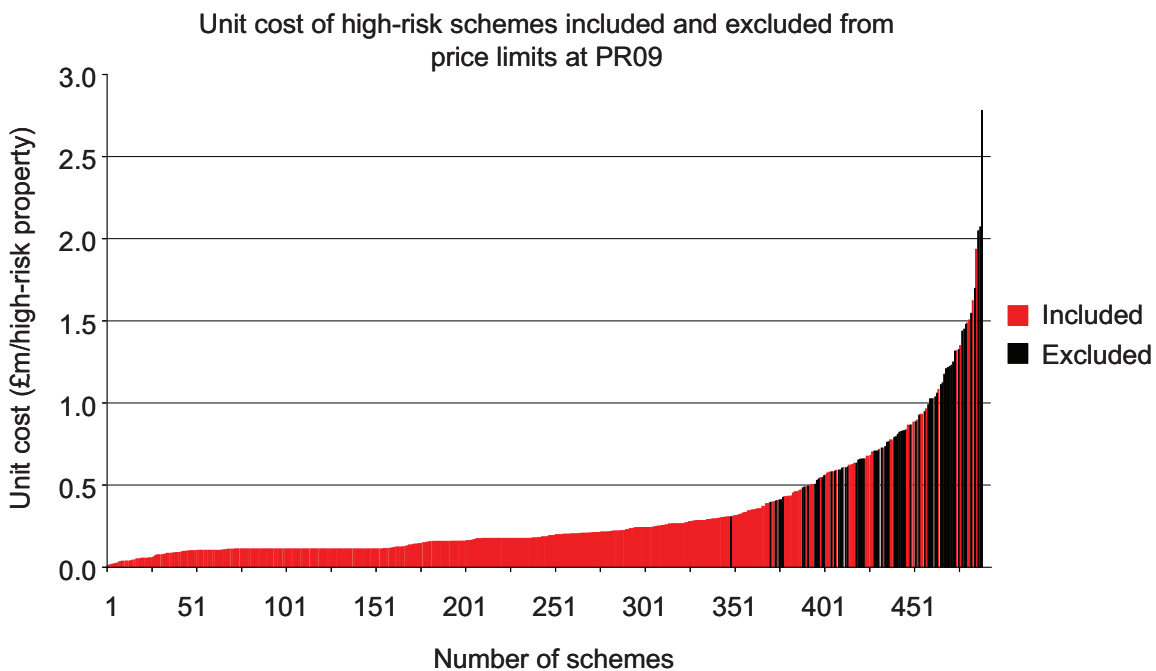
Rising unit costs

While the price limits we set in 2004 enabled companies to deal with a proportion of higher cost problems during 2005-10, many of the properties remaining on the registers at 2010 require solutions that cost more than the current five-year average solution cost. As the percentage of properties on the high-risk registers fall, there is a trend for

solutions to become more expensive. Companies have told us they have already delivered many of the low cost solutions with an upward trend in the cost of solutions going forward into 2010-15.

Using the final business plan submissions, we have carefully considered the balance of scheme cost and benefit for sewer flooding schemes whilst taking into account the companies' CBA. Figure 8 shows the profile of unit costs for the schemes proposed by companies within their final business plans and representations. It shows that while some companies are still dealing with problems with relatively low unit costs of between £200,000 and £250,000, there is a significant upturn in the unit cost of solutions, with some companies proposing very high cost schemes of up to £1 million or £2 million per property removed from the register.

Figure 8 Unit cost of high-risk schemes included and excluded from price limits at PR09



Where a solution has a very high unit cost or is not cost-beneficial, companies should examine alternatives, including those that provide a slightly lower level of protection. More complex mitigation solutions may be appropriate in these cases. It remains the company's responsibility to continue investigating and identifying alternative solutions to emerging problems and keep customers informed of progress until it has alleviated the risk of flooding.

Most companies have seen a drop in the number of properties on the 2-in-10 and 1-in-10 registers since 2005. The improvements result from capital investment and improvements in data. As companies have investigated problems and carried out

solutions, they have improved their understanding of flooding risk. Many companies now have very low numbers on the risk registers and a high confidence in this position.

Some companies have re-assessed the way they have allocated properties to the risk registers during 2005-10. We understand the reasons behind the changes and expect registers to reflect the risk of flooding to properties that have already flooded. We are examining ways of introducing a proactive risk based register that will reflect both the impact of flooding as well as the frequency of flooding.

3.2.3 Odour from sewage treatment works

Our price limits will enable companies to deal with sewage treatment odour problems at a number of operational sites, such as sewage works and pumping stations. Table 16 shows the number of odour treatment sites included in our final determinations. We have challenged the companies on the expenditure required to deliver these benefits to consumers.

Table 16 Odour treatment sites by company

Company	Number of odour treatment sites	
	Sewage works	Pumping stations/ network sites
Anglian	2	89
Dŵr Cymru	22	18
United Utilities	3	0
Northumbrian	2	0
Severn Trent	16	0
Southern	4	0
South West	14	0
Thames	9	0
Wessex	0	0
Yorkshire	3	0
Total	76	107

3.2.4 Sewage sludge treatment, recycling and disposal

Most investment in sewage sludge treatment, recycling and disposal is to maintain, optimise and/or expand anaerobic digestion facilities. Expansion in this area improves the opportunities for companies to generate renewable energy. This in turn will allow them to reduce their own energy costs, with future benefits for customers, and the investment will lead to an increase in the renewable energy that the companies generate of 266 GWh/year by 2014-15. Table 17 shows the total energy that each company will generate from sewage sludge processing in 2014-15.

Other investment by the companies ensures that sludge treatment sites meet environmental permit conditions, and facilitates sludge recycling in newly designated nitrate vulnerable zones.

Table 17 Energy generated from sewage sludge processing by 2014-15

Company	GWh/year
Anglian	87
Dŵr Cymru	46
Northumbrian	71
Severn Trent	180
South West	10
Southern	64
Thames	288
United Utilities	125
Wessex	51
Yorkshire	43
Industry total	965

3.2.5 Supply and demand balance for water and sewerage

Our price limit assumptions allow each company over the next five years to:

- meet target headroom in all water resource zones, delivering a security of supply index of 100 by 2014-15;
- maintain leakage at the identified sustainable, economic level, delivering reductions where appropriate;
- meet water efficiency targets;
- install water meters in line with legal obligations;
- connect new properties to the water and sewerage network; and
- expand the sewerage network and sewage treatment capacity as required to accommodate new demand with no deterioration in service levels.

3.2.6 Security of supply

The security of supply index is an indicator of the extent to which a company is able to guarantee its planned level of service. A company with a security of supply index of 100 should not need to impose restrictions on use more frequently, on average, than it states in its planned level of service. Most companies will have achieved a security of supply index of 100 by 2009-10. We expect all companies to maintain or achieve a security of supply index of 100 by 2014-15.

With growing pressures on water supply and demand, many companies need to increase supply or manage demand in order to achieve their targets for security of supply. Table 18 shows the total volumes of water that the companies must make available from increased supply or demand savings by 2014-15. The similarity between

the volume delivered through supply enhancements and demand savings indicates that the industry as a whole is pursuing a twin-track approach.

Table 18 Supply/demand capacity enhancements (dry year)

Component	Increase in capacity by 2014-15 (MI/d)	% of 2008-09 water delivered
Supply-side enhancements (MI/d)	159	1.35
Demand-side water savings (MI/d)^	164	1.39
Total enhancements (MI/d)	323	2.74

Note:

^ Includes demand savings from selective metering, enhanced water efficiency (SELWE) and leakage reductions. Excludes savings from optional metering and base service water efficiency.

3.2.7 Leakage and water efficiency

We expect companies to achieve targets for two of the demand-side measures – leakage and water efficiency. As population growth and climate change put increasing pressure on our water resources, it is even more important that we waste as little water as possible. The companies must play their part by maintaining leakage at a sustainable, economic level.

Even if it were possible, eliminating leakage altogether would be a wasteful use of resources. The cost of doing so, including the substantial environmental impacts, would far exceed the cost of balancing water supply and demand by other means, and that would mean higher bills for customers. Instead, we expect companies to keep leakage down to a sustainable, economic level. Below this level, the costs of additional leakage control would exceed the benefits. We expect each company to measure costs and benefits comprehensively – taking account of the environmental impact of leakage control and other options, and of customers’ views.

Each company has a duty to promote the efficient use of water by customers. We monitor the companies’ performance against this duty, but we have not previously had a quantitative framework for doing this. In [PR09/20, ‘Water supply and demand policy’](#) (November 2008), we confirmed our proposals for water efficiency targets, which will provide such a framework. Our targets are made up of two elements.

- A **base service water efficiency target**, which is equivalent to one litre per property per day for all companies. This target reflects the level of activity that we judge companies should undertake to meet their duty.
- A **sustainable, economic level of water efficiency**, which forms part of a best-value strategy to balance the supply and demand for water, bringing benefits to consumers and to the environment.

We have set out targets on leakage in table 19 and on water efficiency in table 20.

We expect companies to maintain leakage at current levels or to reduce it slightly over 2010-15. Some stakeholders expressed concern, following the draft determination, that we were not pressing companies to reduce leakage significantly over 2010-15. In most cases, however, the evidence suggests that more significant reductions over this timescale would represent poor value for customers and the environment (although Severn Trent is a notable exception). Moreover, with an expanding pipe network, maintaining leakage at current levels still requires companies to increase their leakage control activity because even new pipes leak.

Table 19 Leakage assumptions 2010-11 to 2014-15

	Leakage assumptions (MI/d)				
	2010-11	2011-12	2012-13	2013-14	2014-15
Water and sewerage companies					
Anglian	212	212	211	211	211
Dŵr Cymru	190	188	186	185	184
Northumbrian					
Northumbrian	150	150	150	150	150
Essex & Suffolk	66	66	66	66	66
Severn Trent	483	474	468	456	453
South West	84	84	84	84	84
Southern	83	80	79	78	77
Thames	674	673	673	673	673
United Utilities	464	464	464	463	463
Wessex	71	71	71	71	71
Yorkshire	297	297	297	297	297
Water only companies					
Bournemouth & W Hampshire	22	22	22	22	21
Bristol	52	51	50	49	49
Cambridge	14.0	14.0	14.0	14.0	14.0
Dee Valley	10.2	10.2	10.2	10.2	10.2
Portsmouth	30	30	30	30	30
South East	95	95	94	94	93
South Staffs	74	74	74	74	74
Sutton & East Surrey	25	25	25	25	25
Veolia Central	185	185	185	185	185
Veolia East	5.1	5.1	5.1	5.1	5.1
Veolia Southeast	7.9	7.8	7.7	7.6	7.5
Industry total	3,294	3,278	3,266	3,250	3,243

Note:

Totals may not add up because of rounding (less than 20 Mld to 1 decimal point; above 20 Mld no decimal points).

Most companies' water efficiency targets comprise only base service water efficiency. We have assumed additional water efficiency measures – a sustainable, economic level of water efficiency (SELWE) – for:

- Anglian;
- Dŵr Cymru;
- South West;
- Thames;
- United Utilities; and
- Bristol.

Table 20 Water efficiency assumed savings

	Water efficiency assumed savings (MI/d)				
	2010-11	2011-12	2012-13	2013-14	2014-15
Water and sewerage companies					
Anglian	2.45	2.45	2.45	2.45	2.45
Dŵr Cymru	1.32	1.32	1.32	1.37	1.38
Northumbrian					
Northumbrian	1.12	1.12	1.12	1.12	1.12
Essex & Suffolk	0.74	0.74	0.74	0.74	0.74
Severn Trent	3.27	3.27	3.27	3.27	3.27
South West	1.39	1.39	1.39	1.39	1.39
Southern	1.01	1.01	1.01	1.01	1.01
Thames	4.42	4.42	4.42	4.42	4.42
United Utilities	3.02	3.02	3.02	3.02	3.02
Wessex	0.55	0.55	0.55	0.55	0.55
Yorkshire	2.05	2.05	2.05	2.05	2.05
Water only companies					
Bournemouth & W Hampshire	0.19	0.19	0.19	0.19	0.19
Bristol	0.80	0.80	0.80	0.80	0.80
Cambridge	0.12	0.12	0.12	0.12	0.12
Dee Valley	0.12	0.12	0.12	0.12	0.12
Portsmouth	0.29	0.29	0.29	0.29	0.29
South East	0.84	0.84	0.84	0.84	0.84
South Staffs	0.53	0.53	0.53	0.53	0.53
Sutton & East Surrey	0.27	0.27	0.27	0.27	0.27
Veolia Central	1.24	1.24	1.24	1.24	1.24
Veolia East	0.04	0.04	0.04	0.04	0.04
Veolia Southeast	0.07	0.07	0.07	0.07	0.07
Industry total	25.85	25.85	25.85	25.90	25.91

Note:

Totals may not add because of rounding.

3.2.8 Metering

Table 21 shows our assumptions about the meters that companies must install under the free meter option and meters installed compulsorily or on change of occupier. Under these assumptions, the proportion of household customers with a meter will increase

from about 37% in 2009-10 to about 50% in 2014-15. In regions that the Environment Agency has classified as seriously water stressed, the proportion will rise to about 57% by 2014-15.

In the long term, we think that all customers should pay for water according to how much they use. It is the fairest system of charging, and it encourages consumers to use water wisely.

In most cases, customers are setting the pace at which companies move towards fully (or near-fully) metered charging. Customers can opt to have a meter installed free of charge, and many do so to reduce their bills. However, companies can also help set the pace of metering. They are entitled to install meters when there is a change of occupier at a property. In addition, in areas that the Environment Agency defines as seriously water stressed, companies can install meters at their discretion, subject to ministerial approval of their water resource management plan proposals. Our determinations support extensive compulsory metering for Southern, South East, and Veolia Southeast. For Southern and Veolia Southeast, we expect household metering levels to be at least 90% by the end of 2015.

We have accepted most companies' proposals for additional metering. Some failed to demonstrate that the benefits of metering would exceed the costs in areas where they did not need to reduce water use in order to balance supply and demand. We did not accept these companies' proposals for our final determinations.

Following this price review, we will work with the Environment Agency and other stakeholders to develop a more robust framework and improved evidence base for companies to assess the costs and benefits of accelerated metering and smart metering. We indicated in our [response](#) to the independent review of charging for household water and sewerage services (chaired by Anna Walker) that we would set up a steering group to help deliver these objectives. We will establish this group early in 2010. If, in light of this work, companies are able to demonstrate a clear case for additional metering, we will consider how to take this forward.

Table 21 Metering assumptions 2010-11 to 2014-15 totals

	Optional meters (000)	Additional meters (000)	% of household customers metered by 2014-15
Water and sewerage companies			
Anglian	124	185	81
Dŵr Cymru	99	0.5	41
Northumbrian	101	55	43
Severn Trent	198	11	42
South West	79	0	79
Southern	22	465	92
Thames	139	86	37
United Utilities	232	3.2	38
Wessex	49	0	58
Yorkshire	163	0	48
Water only companies			
Bournemouth & W Hampshire	11.3	7.4	66
Bristol	35.4	16.8	46
Cambridge	6.2	0	70
Dee Valley	8.5	0	58
Portsmouth	25	0	24
South East	19.4	176	68
South Staffs	30.5	15.9	35
Sutton & East Surrey	8.4	23.5	47
Veolia Central	50.0	0	44
Veolia East	3.9	0	71
Veolia Southeast	0.8	8.5	90
Industry total	1,405	1,053	50

3.2.9 New connections

We have assumed that companies will connect an additional 998,000 properties to the water service and 996,000 properties to the sewerage service over 2010-15. This represents an increase from our draft determinations on the number of new connections over 2005-10, which were 948,000 and 898,000 for water and sewerage, respectively.

We expect companies to fulfil their statutory duties and allow connection to the water and sewerage system for all new developments. We set price limits to enable efficient companies to meet their statutory duties, including their statutory obligations to permit connections to the water and sewerage systems. Companies must not seek to delay work just because in their view, price limits do not provide for it. We expect them to liaise with planning authorities to make sure that plans deliver best value outcomes.

3.2.10 Sewage treatment capacity

Companies plan to increase their sewage treatment capacity to keep pace with increased demands from population growth. Overall, companies propose to expand their

treatment capacity to meet the demands of an additional 1.8 million people, although they are projecting population growth of 1.5 million people. We have accepted companies' plans to expand capacity at a greater rate than population growth, because:

- they need to address existing under-capacity; and
- some companies are investing strategically to anticipate growth in future planning periods.

We will monitor companies' progress carefully.

3.2.11 Drinking water quality

Price limits will allow companies to undertake necessary improvements, including further treatment to address nitrate problems, cryptosporidium risk, and pesticide removal, as agreed with the DWI. Price limits also include assumptions for more than 100 catchment management schemes and investigations proposed by companies in their final business plans. These provide for action or investigation at the catchment level to address deteriorating raw water quality, rather than pursuing traditional, capital-intensive treatment solutions.

As well as potential savings in both capital and operating expenditure, catchment approaches could deliver longer-term benefits, including reduced greenhouse gas emissions, improved biodiversity and contributing to more stable river flows. We want to ensure that a full understanding of what catchment management can deliver is captured to maximise the overall benefits of this investment. To achieve this, we will work with the companies and the quality regulators to put in place reporting and monitoring mechanisms that will allow us to identify and assess value added and to promote good practice.

Our price limits also allow the following.

- **Continuing reductions in lead levels, but excluding work related to customer-owned supply pipes.** We do not believe that customers as a whole should meet the cost of such work, particularly as some have already paid to have their lead supply pipes replaced and most continue to have no problems with lead. We recognise the challenges that some companies may face when the new 10µg/l lead standard comes into effect in 2013 and we will continue to work with the DWI and others on the way forward.
- **Companies to meet their environmental obligations relating to drinking water provision.** These are primarily investigations into the hydrological and ecological impacts of abstraction, and schemes to meet the requirements of the Water Framework Directive, the Habitats Directive, the UK Biodiversity Action Plan and the Countryside and Rights of Way Act.

- **Companies to address drinking water related aspects of the Security and Emergency Measures Direction.**

Table 22 summarises the schemes (including investigations) to improve drinking water quality included in price limits. It reflects the increase in projects arising from additional DWI guidance since draft business plans.

Table 22 Driver actions for drinking water quality, environmental and other obligations in 2010-15

	Number of enhancements (based on driver count)	Number of investigations (based on driver count)	Total driver actions
<u>Water treatment</u>			
Nitrate removal – to reduce high nitrate levels caused by diffuse pollution present in sources of water used for the drinking water supply	18	1	19
Plumbosolvency control – conditioning of the water supply so it dissolves less lead from companies’ and customers’ pipework	27	0	27
Trihalomethane reduction – changes to company assets to reduce the level of by-products of disinfection to comply with water quality regulations	16	0	16
Turbidity reduction – to improve the clarity of the water supply	10	0	10
Cryptosporidium risk reduction – required measures to companies’ assets to reduce contamination from cryptosporidium	52	0	52
Pesticide removal – to reduce pesticides levels present in sources of water used for the drinking water supply	9	3	12
Other – other work supported by DWI at water treatment works	36	1	37
<u>Water distribution</u>			
Lead communication pipe replacement – replace companies’ pipework, where necessary to help meet lead standards at customers’ taps	25	1	26
<u>Other obligations</u>			
Schemes to improve acceptability of drinking water to consumers – for example, colour, taste, odour.	18	1	19
Security and Emergency Measures Direction – schemes to protect assets and maintain supplies during emergencies	116	0	116
Water quality monitoring investigations	3	14	17
Miscellaneous	18	16	34
<u>Environmental obligations</u>			
Habitats and Birds – compliance with EU Directives through reducing water abstraction affecting valuable nature conservation sites and threatened species	28	6	34

Countryside and Rights of Way Act 2000 – reducing water abstraction affecting sites of special scientific interest	4	8	12
UK Biodiversity Action Plan – reducing water abstraction to further the conservation of biodiversity	12	16	28
Water Framework Directive – schemes to implement river basin management plans to be approved by UK Ministers in order to meet EU WFD requirements	1	29	30
Local priority – changes to water abstraction of significant local importance	0	21	21
Sub-total – new work identified for 2010-15	393	117	510
Interaction with 2005-10 quality programme			
Projects from 2005-10 to be completed in 2010-15	8	0	8
Programme for drinking water, environmental and other obligations	401	117	518

Note:

We have used information provided by companies in the projects database and annex 4 of the supplementary reports in the production of this table.

3.2.12 Environmental quality improvements

Our price limits include environmental improvements necessary to satisfy companies' statutory and regulatory requirements. We have set out the specific programme for each company in the supplementary material sent as part of our final determination. We have worked closely with the quality regulators to establish a programme of investment that delivers their requirements and has been rigorously tested for value, taking into account customers' preferences and the current economic climate.

This includes work needed to implement the Water Framework Directive (WFD) and other EU Directives, including those covering Urban Waste Water Treatment, Bathing Waters and Habitats, as set out in the Environment Agency's NEP.

We have worked particularly closely with the Environment Agency on the possible application of the disproportionate cost assessment under the WFD. Price limits exclude a number of schemes that are provisional candidates for exemption under Article 4 of the WFD because of an extremely poor benefit:cost ratio. Ministers will take final decisions on schemes to be included in the initial river basin management plans in December 2009.

Excluding the WFD schemes mentioned above, our price limits include more than 99% of the quality schemes included in the current NEP (to be finalised early in 2010).

Our price limits also include work needed to enable compliance with revised flow conditions in discharge consents. Table 23 summarises the improvement programme showing the number of projects (including investigations) in each key area.

Table 23 Outputs for environmental quality and other obligations in 2010-15

	Number of improvements ¹	Number of investigations	Total number of outputs
Compliance with EU directives			
Urban Waste Water Treatment – upgrades to sewage treatment works to produce cleaner discharges to the environment	91	0	91
Unsatisfactory intermittent discharges – to limit pollution from combined sewer overflows, emergency overflows and storm tanks	100	2	102
Groundwater – investigations and improvements to treated effluents and intermittent discharges which may affect groundwater	84	29	113
Freshwater Fish – reduction in levels of pollutants, principally ammonia in discharges from sewage treatment works to allow more favourable habitats for fish	31	7	38
Bathing Water Directives – investigating and improving sewage treatment works and overflows to assist compliance with EU microbiological standards	102	32	134
Shellfish Waters – reduction of microbiological pollution to ensure a suitable environment for shellfish	81	28	109
Habitats – improvement in quality of discharges to safeguard valuable nature conservation sites and threatened species	71	0	71
Water Framework Directive – schemes and investigations in accordance with the river basin management plans (to be approved by UK Ministers) in order to meet WFD requirements. Typically covers objectives for ammonia, phosphorus, biochemical oxygen demand and dissolved oxygen standards in rivers and discharges to groundwater	87	52	139
Water Framework Directive (Chemicals) – investigations to quantify risk from chemicals, assess catchment sources and assess treatment options	0	125	125
National legislation and policy initiatives			
Countryside and Rights of Way Act – investigations and improvements to the quality of water affecting sites of special scientific interest (SSSIs)	16	17	33
Biodiversity Action Plan – water quality improvements and studies to meet conservation targets under the UK Biodiversity Action Plan	2	9	11
First-time sewerage – connecting properties to the public sewerage system to address actual or potential environmental or amenity problems caused by the existing drainage arrangements	63	1	64
Local priority – improvement schemes and studies that are of significant local importance	2	7	9
Environmental Permitting Regulations – schemes to provide first time combined heat and power (CHP) or pollution prevention measures	51	2	53
Sewage sludge management – schemes to address the impact of extending designations of nitrate vulnerable zones	14	0	14

Sustain planned level of environmental protection – improvements needed to ensure continued achievement of standards established at previous price reviews (for example, dealing with misconnections)	2	0	2
Discharge flow limit increases – schemes identified to ensure no deterioration in the current classification of water as a result of increased volumes of sewage	185	0	185
Security and Emergency Measures Direction – schemes to protect assets and assessments of further improvements needed beyond 2015	16	4	20
Sub-total – new work identified for 2010-15	998	315	1,313
Other, including interaction with 2005-10 quality programme	42	0	42
Quality programme for the sewerage service	1,040	315	1,355

Notes:

1. Improvements include schemes categorised as enhancing the sewerage system, sewage treatment works or sludge disposal facilities, or involving the provision of event and duration monitors at storm overflows.
2. The number of outputs should not be taken as the number of sites or assets being improved (or investigated). Some outputs will cover several sites while some sites are affected by more than one obligation and therefore will have more than one output associated with them.
3. This table is not directly comparable with table 20 in our draft determination national document. At draft determination outputs were allocated to obligations on the basis of the driver assigned to be the primary cost driver by companies in their final business plan. However, for final determination we have recorded an output for each cost driver that applies.

3.2.13 Climate change

Companies' strategic direction statements highlighted climate change as a key challenge. Most considered it one of their priority items. Understanding the impacts of climate change and finding innovative solutions were common themes throughout the strategic direction statements. In their business plan proposals, many companies recognised the long-term nature of climate change, requiring investments beyond this current review period.

Our aim is to safeguard sustainable water and sewerage services both now and in the future. This underpinned our approach to assessing business plans and we have challenged companies to demonstrate an awareness of how sustainability affects all aspects of their operations and long-term planning. In ['Preparing for the future – Ofwat's climate change policy statement'](#) (July 2008), and our feedback on draft and final business plans, we encouraged each company to take a coherent and full account of climate change. Specifically, companies need to adapt to the unavoidable impacts of climate change and mitigate the industry's future impacts from their greenhouse gas emissions.

Adaptation

Adaptation in the form of increased resilience featured strongly in companies' strategic direction statements. This was reflected in the final business plans. The experience of the 2007 floods and a greater appreciation of the increased potential for extreme weather events because of climate change led to a significant number of proposals to increase resilience. These took the form of:

- network resilience projects, which protect from a number of hazards; and
- asset-specific flood resilience measures.

In total, our final determinations include resilience schemes that benefit almost 10 million consumers. Table 24 lists further details of resilience schemes.

It is vital that companies take the most up-to-date evidence on the impact of climate change on the balance between water supply and demand into account. The evidence available to companies when they prepared their final business plans was out of date and soon to be superseded by the UKCP09 scenarios. We explained in our draft [CIS baseline](#) that we would not allow for significant climate change-driven expenditure to balance water supply and demand in price limits without satisfactory supporting evidence based on UKCP09 scenario analysis.

Recognising that UKCIP has published the UKCP09 scenarios at too late a stage in the price review process for companies to assimilate its impact on their plans, our final determinations include a notified item on climate change and water resources. We discuss this further in section 4.4.1. Our approach aims to make sure that each company makes water resource investment decisions based on robust evidence, and that they do not have to delay those decisions unnecessarily because of the price review timetable.

Table 24 Details of climate change adaptation and mitigation measures

Adaptation	Mitigation
By 2016, 9.6 million people will benefit from increased service resilience to external hazards, such as flooding	We included all of the 33 stand-alone renewable energy schemes proposed within price limits
We included £414 million for network and asset resilience schemes	We included £57 million for renewable energy projects, delivering £8.8 million of operational expenditure savings to customers every year when complete.
Companies will protect more than 150 critical, at-risk assets and carry out 13 major network resilience schemes	By 2015, companies will be generating over more than 1TWh a year from renewable energy sources
More than 100 catchment management and investigation schemes are included in price limits – at the last price review there were only two such schemes	This saves the equivalent of more than half a million tonnes of CO ₂ e each year

Mitigation

Companies identified reducing greenhouse gas emissions as a key issue in their strategic direction statements. Many set themselves ambitious, long-term, carbon targets. In most cases, specific details of how they would achieve targets failed to appear in their business plans.

Including the shadow price of carbon within CBA at this price review made companies consider the carbon implications of their proposals and promoted mitigation actions to reduce emissions. After our draft determinations, we asked companies, where

appropriate, to take account of the Government's new non-traded price of carbon. This change almost doubled the price of carbon. Details were set out in [PR09/33, 'An updated carbon price for use in investment appraisals'](#) (August 2009). This change affected decisions for a small number of schemes.

Carbon reduction featured in a number of ways – through increased efficiency, asset maintenance regimes, innovation and renewable energy generation. We will see a step change in the amount of renewable energy generated, with an increase of more than 42% between 2009-10 and 2014-15. In total, companies will deliver an extra 300 GWh of renewable energy a year.

The largest changes in renewable energy generation come from companies' sludge strategies. Details of the energy that each company generates from sludge are in section 3.2.4 (table 17). We have considered carefully how these schemes deliver benefits to customers. In most cases, changes to sludge strategies deliver multiple long-term benefits – wider than just renewable energy generation.

We have also included renewable energy generation schemes that fall outside the companies' sewage sludge programmes (and which are clearly part of the appointed business) if they are justified by the long-term benefits to customers. When the schemes are fully operational (2015-16), they will generate 88 GWh of renewable energy each year. Our price limits will pass on financial benefits to customers through reduced operational costs for companies. As well as the financial benefits, the wider population and the environment gains from lower overall emissions. Further details are set out in table 24.

Our price limits also allow for a significant increase in work on catchment management. This is where work takes place to manage the upstream parts of a catchment area to improve raw water quality (see section 3.2.11). These proposals offer potential to contribute to both climate change adaptation and mitigation. They can offer a lower carbon outcome by reducing the need for end-of-pipe, energy-intensive, hard-engineering solutions. Seventeen water companies made catchment management proposals for drinking water quality in their final business plans. At the last price review in 2004, there were only two such schemes.

We are pleased to see companies beginning to address the challenges that climate change presents, although we would like to see the evidence base for specific investment cases strengthened. We will summarise learning points from companies' work in separate publications after the final determinations. Looking forward, we challenge the companies to build on their work, taking forward the new UKCP09 scenarios to understand the impact of climate change.

3.2.14 Large projects

In March 2007, the Government announced its decision to support the development of a full tunnel and treatment solution to improve the river water quality of the tidal River Thames. We have included expenditure for Thames on the London Tideway Tunnels. This comprises two projects.

- The Lee tunnel from Abbey Mills pumping station to Beckton sewage treatment works.
- The Thames tunnel from West London to Beckton sewage treatment works.

The combined tunnels will provide storage of 1.6 million cubic metres and the Beckton pumping station will empty the tunnel in 48 hours. The Lee tunnel is scheduled for completion by the end of 2014. For Thames' draft determination, we developed an adapted regulatory approach with the company to reflect the specific risks of the project and to incentivise efficient delivery. This approach dealt with the project outside of the CIS mechanism. Thames informed us that it would prefer the expenditure relating to the Lee tunnel to be considered in the CIS mechanism and we have done this for our final determinations.

There remains a range of possible funding and delivery models for the longer Thames tunnel, which is not due for completion until 2020 (including possibly delivery by a specialist project company). We have included expenditure only relating to scheme development and known land acquisition costs. We have included a notified item for land acquisition for the Thames tunnel component of the London Tideway Tunnels. This defines as a notified item the acquisition of land greater than the amount allowed in price limits subject to set criteria.

We will work with Thames and other stakeholders over the coming months to assess the feasibility of alternative delivery models.

3.3 Other service enhancements

Some companies' plans identified a need to improve other aspects of customer service. The most commonly proposed improvement was to tackle localised issues of discoloured drinking water. We have assessed these proposals as part of companies' ongoing maintenance plans.

Our final determinations also allow for:

- improved water pressure to 154 homes in Wales, Yorkshire and Cambridge;
- surveying 1 million households in the Severn Trent region to identify and solve low pressure caused by shared supply pipes; and

- a pilot study to improve taste and odour of drinking water, benefiting 100 households each year in the Northumbrian and Essex & Suffolk regions and to inform future strategy.

4. Understanding the costs of delivery and our assumptions for future expenditure



This chapter sets out our final assumptions on costs and expenditure. We explain how we have reached our conclusions on the expenditure included in price limits, including how we have used the CIS and our approach to efficiency.

We show the expenditure assumptions included in our final price limits and companies' proposals for their final business plans in table 25. We have included the five-year total for capital expenditure and show the annual average for operating expenditure.

Table 25 Projections of expenditure 2010-15 (post-efficiency and CIS)

	Final business plans			Final determinations		
	Water	Sewerage	Total	Water	Sewerage	Total
Capital expenditure¹ (five-year total – £bn)						
Base service:						
Infrastructure renewals expenditure	2.8	1.4	4.2	3.2	1.4	4.7
Non-infrastructure capital maintenance	3.7	4.8	8.5	3.6	4.6	8.2
Supply/demand balance	1.9	1.5	3.4	1.4	1.3	2.7
Quality enhancements	1.4	3.9	5.2	1.1	3.4	4.6
Enhanced service levels	0.7	1.1	1.8	0.3	0.8	1.1
Large projects	0.2	1.0	1.1	0.0	0.9	0.9
Total	10.6	13.6	24.2	9.6	12.5	22.1
£ per property	440	584	1,024	398	539	937
Operating expenditure (annual average – £m)						
Base service	2,074	1,593	3,667	1,995	1,584	3,579
Supply/demand balance	42	23	65	26	15	41
Quality enhancements	35	75	110	14	57	71
Enhanced service levels	2	1	4	1	2	3
Large projects	<1	<1	<1	0	<1	<1
Total	2,153	1,692	3,845	2,036	1,658	3,694
£ per property	89	73	162	84	71	156

Note:

1. Capital expenditure is net of capital contributions.

4.1 Capital expenditure

Table 26 shows the capital expenditure included in price limits for each company.

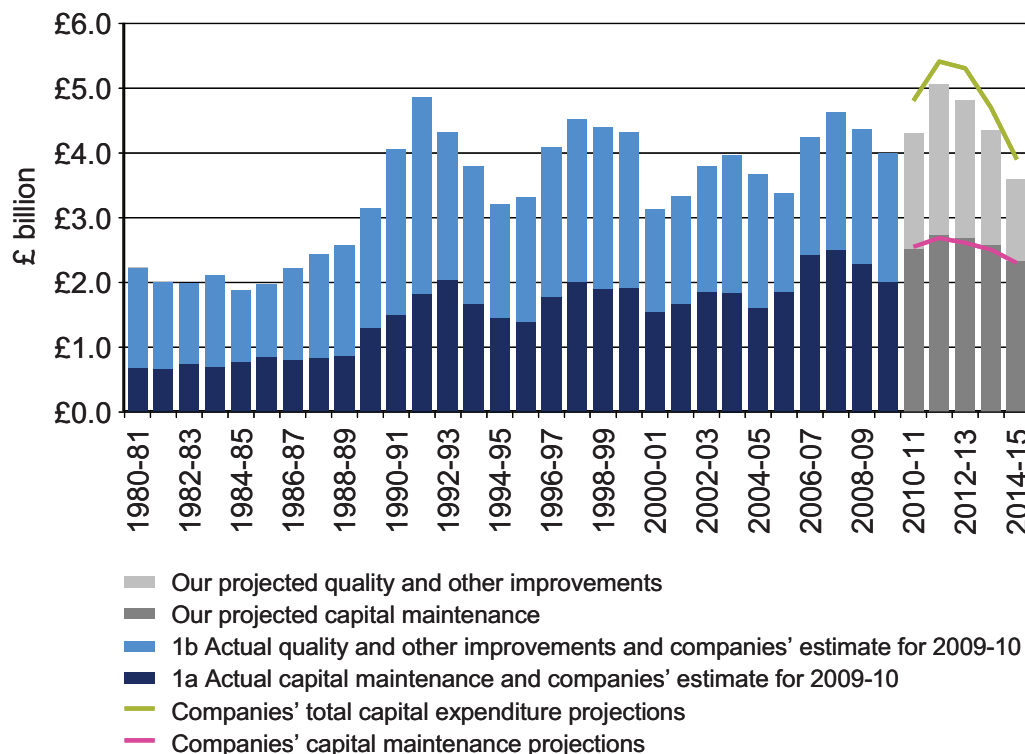
Table 26 Capital expenditure by company (post-efficiency and CIS)

	Capital expenditure (five year total) 2010-15 (£m)					
	Water	Sewerage	Total	Water £/property	Sewerage £/property	Total £/property
Water and sewerage companies						
Anglian	938	1,184	2,122	469	462	931
Dŵr Cymru	536	567	1,104	401	418	820
Northumbrian	709	509	1,217	369	430	799
Severn Trent	1,100	1,351	2,452	328	353	681
South West	294	378	672	378	545	923
Southern	468	1,283	1,752	450	693	1,142
Thames	1,513	3,400	4,913	424	618	1,041
United Utilities	1,384	2,188	3,572	455	722	1,177
Wessex	485	531	1,016	843	457	1,301
Yorkshire	727	1,149	1,875	345	546	891
WaSC total	8,154	12,540	20,694	413	539	952
Water only companies						
Bournemouth & W Hampshire	44		44	224		224
Bristol	244		244	485		485
Cambridge	30		30	233		233
Dee Valley	34		34	286		286
Portsmouth	39		39	126		126
South East	390		390	444		444
South Staffs	135		135	248		248
Sutton & East Surrey	102		102	369		369
Veolia Central	366		366	292		292
Veolia East	14		14	193		193
Veolia Southeast	35		35	464		464
WoC total	1,435		1,435	329		329
Industry total	9,588	12,540	22,128	398	539	937

Our final price limits include capital expenditure assumptions for England and Wales for the five-year period totalling £22.1 billion. This is higher than the investment included when we last set price limits in 2004. In their final business plans, companies had asked us to include a total of £24 billion. The difference between the two figures relates to our views on efficiency, on the scope and scale of investment, and on how to deal with uncertainty.

Figure 9 shows how the capital expenditure included in our final determinations compares with earlier investment periods. It also shows the capital expenditure included in companies' final business plans.

Figure 9 Actual and projected capital investment 1981-2015



4.2 Capital expenditure incentive scheme (CIS)

The CIS is an important new feature for this price review. It provides strong incentives for companies to put forward challenging and efficient business plans before our determinations and to strive to beat our price limit assumptions after them. The CIS process has also allowed us to give the companies greater certainty about the likely shape of the capital programme at an earlier stage of the price review. As at previous price reviews, we have reviewed and challenged the scope and cost of investment proposals according to different drivers of investment; we set out our approach in this section.

Under the CIS, each company recovers its actual capital expenditure plus or minus an incentive allowance that depends on its forecast of capital expenditure and its actual expenditure in 2010-15. At the next price review, we will reconcile the rewards or penalties due under CIS, taking account of actual capital expenditure along with the expenditure assumptions and additional income allowed in price limits. We will also adjust each company's regulatory capital value (RCV) to reflect actual 2010-15 capital expenditure.

The CIS allows for symmetric treatment of capital expenditure over- and under-spends against the assumptions in our determinations. So, if a company chooses to spend more

than our price limit assumptions, we will reflect actual expenditure in the future RCV. We think that this symmetrical approach decreases risk and we have made our judgements on the cost of capital with this in mind.

4.2.1 CIS ratios

The CIS ratios are the key drivers of the overall CIS incentives. The CIS ratio at industry level for our final determinations is 109 for the water service and 105 for sewerage (based on industry aggregates). For our draft determinations, these ratios were higher at 120 for water and 115 for sewerage and were even higher for the original December 2008 baseline at 128 and 126 respectively. CIS ratios have come down for most companies and we now have a number below 100, with corresponding improvements in CIS incentives. However, a number of companies still have high ratios, some above 130.

Table 27 sets out the CIS ratios for each company based on their final business plans.

Table 27 CIS baseline ratios

Water and sewerage companies	Water	Sewerage	Water only companies	Water
Anglian	105	99	Bournemouth & W Hants	115
Dŵr Cymru	105	106	Bristol	138
Northumbrian	103	101	Cambridge	101
Severn Trent	102	102	Dee Valley	99
South West	105	110	Veolia Southeast	119
Southern	122	112	Portsmouth	108
Thames	125	108	South East	129
United Utilities	94	108	South Staffs	107
Wessex	104	97	Sutton & East Surrey	124
Yorkshire	100*	93	Veolia East	143
			Veolia Central	131

Note:

* Yorkshire Water to absolute decimal accuracy is below 100.

As we set out in December 2008, in calculating CIS ratios we have:

- applied 'one-sided' challenges for most of our challenges to company plans, adjusting the expenditure assumption for our baseline only. This increases the CIS ratio; and
- applied 'two-sided' challenges where a challenge or exclusion reflects new guidance on regulatory expectations or outputs, or a correction of minor errors. In these cases, we adjust both the company view of expenditure and our baseline assumption, with no net impact on the CIS ratio and resulting incentives.

The movement in CIS ratios reflects a number of factors.

- Improved evidence and justification submitted at a late stage in the process by companies through the draft determination representation process.
- Companies have clarified commitment to verifiable measures of outputs or service improvements, enabling us to include more proposed investment.
- Clarification of some quality requirements from quality regulators following draft determinations.
- We have amended some of our challenges to a two-sided approach following representations.
- Changes to our approach in challenging capital maintenance expenditure.

We have included the CIS matrix in appendix 2. It remains unchanged from that used for the draft baseline in December 2008, and for our draft determinations in July 2009. As for our draft determinations, we have capped the operation of certain aspects of the matrix at a ratio of 130; we explain this in the appendix.

4.2.2 The CIS baseline

Underpinning the ratios is the CIS baseline. This represents our central view of capital expenditure needs for each company, based on the evidence provided to us in:

- companies' business plans;
- cost base submissions;
- the June returns; and
- companies' representations on our draft determinations.

In making our decisions, we have taken account of guidance issued by both Defra and the Welsh Assembly Government. Where appropriate, we have also taken account of the views of other stakeholders, including CCWater, the Environment Agency, DWI, and Natural England. In reaching our view, we have considered each company's proposals carefully and challenged them with the aim of securing the best value for customers. We have also taken into account the views of each company's reporter and the conclusions of the joint consumer research.

In December 2008, we provided each company with our initial view of its capital expenditure needs based on its draft business plan. We also showed companies' business plan expenditure as a percentage of our baseline (the 'CIS ratio'). For example, a CIS ratio of 120 would mean that the company view of expenditure was 20% higher than our baseline. This formed an important reference point for companies' own challenge of their draft business plans in preparing their final business plan submissions.

Tables 28 sets out our industry baseline view for the final determination and links it to the company final business plan baseline.

Table 28 Industry-level CIS baseline

	Total 2010-15	Water service 2010-15	Sewerage service 2010-15
	(£m)	(£m)	(£m)
Company final business plan baseline			
Gross capex pre-efficiency	25,924	11,544	14,380
Transfers out of capex	-149	-149	0
Two-sided adjustments	-731	-205	-526
Gross capex pre-efficiency post-two-sided adjustments	25,044	11,190	13,854
Company efficiency assumptions (applied to the above)	-1,017	-410	-608
FBP: grants and contributions	-1,072	-533	-539
FBP company view (including adjustments)	22,955	10,247	12,708
Ofwat final baseline	(£m)	(£m)	(£m)
Gross capex pre-efficiency	25,924	11,544	14,380
Transfers out of capex	-149	-149	0
Two-sided adjustments	-731	-205	-526
Gross capex pre-efficiency post-two-sided adjustments	25,044	11,190	13,854
Ofwat adjustments for risk and evidence (one-sided adjustments)	-2,019	-1,245	-774
Ofwat: efficiency assumptions including continuing	-363	4	-367
Ofwat view: grants and contributions	-1,144	-572	-571
Ofwat final baseline	21,519	9,377	12,142
Ofwat final baseline	21,519	9,377	12,142
FBP company view	22,955	10,247	12,708
Company:final baseline ratio	107	109	105

In table 29, we have compared the key price capital expenditure assumptions in the price review process – the final business plans (revised to correct allocation issues, post-final business plan output changes, etc), the draft determination, and the final determination.

Table 29 Comparison between the capital expenditure in the CIS baseline, the price limits and the final business plans

All values post-efficiency and net of grants and contributions. In 2007-08 prices (£m)	Revised final business plan capital expenditure included in CIS	CIS baseline (post efficiency) capital expenditure	Final determinations capital expenditure
Water service			
Capital maintenance	6,974	6,629	6,783
Supply/demand balance	1,865	1,370	1,408
Quality enhancements	1,081	1,107	1,122
Enhanced service levels	327	271	275
Sewerage service			
Capital maintenance	6,124	6,017	6,080
Supply/demand balance	1,537	1,304	1,320
Quality enhancements	3,482	3,392	3,438
Enhanced service levels	974	839	845
Large projects	590	590	602 ¹
Total – water and sewerage	22,955	21,519	21,872

Note:

1. In addition the final determination capital expenditure includes £256m associated with the Thames tunnel which is considered outside the CIS.

Our final determinations baseline is £2.3 billion higher than the position at draft determinations. The movement reflects an increase:

- in capital maintenance of £580 million in water and £440 million in sewerage, reflecting the inclusion of more exceptional outputs, and changes to our AMA;
- of £590 million associated with the inclusion of the Lee tunnel in the CIS for our final determinations, under Thames' sewerage quality programme;
- of £240 million driven by improved information on supply/demand balance needs with the inclusion of extra outputs (including some allocation of sewer flooding expenditure), and reduction to some of our cost challenges;
- of £200 million in enhanced service levels, driven primarily by the inclusion of further sewer flooding outputs; and
- of £260 million in quality enhancements, driven by further outputs on SEMD and trunk mains refurbishments in the water service, with inclusion of further NEP outputs in the sewerage service.

4.2.3 Decisions on capital expenditure

Our CIS baseline is founded in the key concept of a central estimate based on a balanced view of risk and efficiency. In setting the baseline and challenging the capital programmes that companies proposed, we have adopted common principles for all cost categories, as set out in table 30.

Table 30 Central estimates

A central estimate represents:	How we derived a central estimate
A balanced representative view of efficiency	We used the cost base comparative tool to challenge the pricing of forecast expenditure. We adjusted expenditure forecasts to an achievable level of efficiency for a middle-ranking company. We based this on a median or representative level of current efficiency, as evidenced through the cost base submissions, adjusted for the future efficiency that we could expect from an average performing company. In adjusting for efficiency, we also took account of evidence on the consistency between cost base and business plan cost estimates.
A balanced view of risk	We reviewed the approach each company has taken on risk, in planning investment in both base service and enhancement. We applied challenges where appropriate.
A well-evidenced forecast expenditure which relates to justified outputs	All outputs must be justified using CBA, sound asset management planning, with expenditure justified and related to outputs. We used the capital estimating scorecard and other evidence to guide challenges to poorly evidenced cost estimates.

In most cases, we used the approach to challenging the costs of delivery from price reviews. This has four key principles.

- **Need** – is there a need for, or customer benefit derived from, the proposed investment?
- **Solution** – has the company demonstrated that its proposal represents the best way of meeting the identified need?
- **Cost** – has the company accurately costed the proposed investment?
- **Efficiency** – what is the evidence on the company’s relative efficiency (through the cost base tool)?

Our challenges fall into the following main groups.

- **Remove proposed investment** – if the company has not demonstrated that a need (or customer benefit) exists (for example, we have challenged proposed improvements in service not supported by cost benefit or willingness to pay evidence).
- **Adjust the scale of proposed investment** – if we accept there is a need for investment, but we have only partially accepted the company’s case on the scale of need (for example, we have challenged some companies’ forecasts of new sewer flooding problems, or required sewage treatment capacity increments).
- **Challenges based on strength of justification** – if we accept the need for investment, but do not consider that the proposed investment is fully evidenced or sufficiently developed to embody a balanced approach to risk.

- **Costing related challenges** – if we have specific evidence that costings that the companies put forward are not robustly justified.
- **Efficiency** – symmetrical adjustments reflecting our view of a company's relative efficiency in delivery of capital programmes, with a further continuing efficiency assumption.

Our assumptions around capital expenditure profiling are based on the profiles that the companies submitted as part of their final business plans. We have chosen not to adjust the shape of these expenditure profiles for our final determinations. We asked companies to review the expenditure profiles in light of our draft determinations and propose re-profiled expenditure levels that would allow them to deliver their capital programmes efficiently and effectively while smoothing the demand for delivery resources within the period. However, companies did not suggest any options for reprofiling in their representations on our draft determinations.

4.3 Capital maintenance investment

Capital maintenance expenditure represents the largest element of the proposed capital programme at nearly 60% of capital expenditure in the CIS baseline and a similar proportion of the investment that companies proposed in their final business plan submissions. Price limits include almost £13 billion of expenditure for capital maintenance – an increase of 21% (£2.2 billion) compared with what we allowed at the last price review.

In setting our assumption for capital maintenance expenditure requirements for 2010-15, we assessed the evidence presented in the companies' final business plans following the approach we set out in our [methodology paper](#).

4.3.1 Asset management assessment (AMA)

We first implemented our AMA approach to assessing capital maintenance expenditure when we set the draft baseline in December 2008. We explained our approach in [PR09/23, 'Asset management assessment \(AMA\) and baseline setting'](#) (January 2009). We then provided further information in [PR09/32, 'Capital maintenance and asset management assessments \(AMA\) for draft determinations – technical note'](#) (August 2009). Our approach is based on the asset management plan assessment process (AMPAP), developed jointly with the water industry in light of experience from the last price review. The criteria for our assessment fall into the main asset management planning areas of:

- stakeholder engagement;
- governance, policy and strategy;
- systems, processes, data and analysis; and

- achieving an optimum balance of risk to service and costs.

We have used a symmetrical approach that creates incentives for companies to provide robustly justified plans that are proportionate to proposals for increased activity and costs. The approach also allows us to challenge historic levels of activity and expenditure where this is appropriate. We have used the company expenditure proposals for 2010-25 and the five years of actual and predicted expenditure for 2005-10 as the starting point for our analysis. This takes account of the most recent evidence on expenditure trends and growth in the asset base. It is, however, only a starting point to the analysis from which we assess planned increases or reductions.

We expected companies to have developed their proposals for capital maintenance within the context set by their SDS. We looked to the business plans to demonstrate a robust risk-based derivation of an economic level of capital maintenance for 2010-15 and beyond. We have challenged companies' proposals if they have been unable to demonstrate that increasing activity is needed to secure levels of service or that customer support justifies the increased costs.

Our AMA for companies' final business plans is a full assessment of the technical and managerial processes applied in developing their capital maintenance business plan submissions. It takes into account both the quality of the technical data and the processes applied, and the quality of the decisions made. This allows us to produce an overall 'AMA score' from a figure for each sub-service.

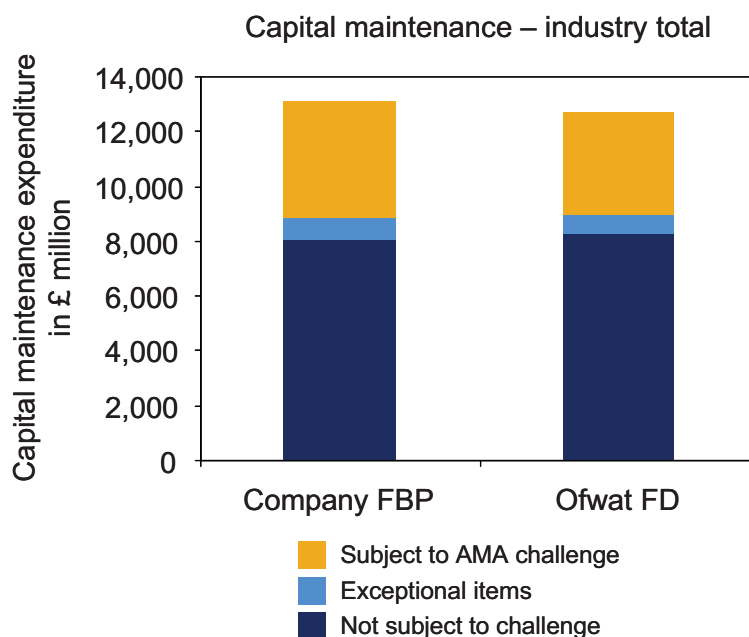
For our final determinations, we have placed emphasis on:

- how companies have balanced the competing pressures for maintaining a stable profile of risk to service and serviceability;
- the upward pressure on prices; and
- the need to deliver good value to customers.

The AMA score does not just reflect a technical application of asset management planning principles, but our overall assessment of the appropriateness of and confidence in the plan for capital maintenance as a whole.

Figure 10 shows the total industry level of capital maintenance expenditure and illustrates the principle components in our assumptions for price limits. These figures are net of companies' and our assumptions for capital efficiency. We explain our assumptions in section 4.10.4.

Figure 10 Total capital maintenance expenditure (post efficiency)



Our AMA approach does not automatically challenge all proposed maintenance expenditure. It is clear that a substantial proportion of activity needs to continue into the next period in order to maintain the capability of assets to continue to deliver services to consumers.

Many companies have demonstrated that the levels of recent activity and expenditure are a sound basis for the future. This can be seen from each company's output performance and the robustness of its planning approach for the future. However, in some cases the evidence was less convincing.

If companies have proposed increases in expenditure, we have challenged adjustments for our price limit assumptions using the AMA assessment. In other cases, companies have proposed reduced activity and expenditure. Here, the AMA approach allows us to provide companies with incentives to maintain services at lower cost.

We applied the AMA challenge to about £4.2 billion of the proposed total capital maintenance programme, with exceptional expenditure items (see section 4.3.3) representing about £800 million of proposed expenditure.

By sub-service, the capital maintenance investment included within our baseline assessments are set out below.

- For water infrastructure investment we have assumed an increase in expenditure of more than £800 million, up 36% compared with that assumed at the 2004 price review. This reflects consolidation of work on water distribution assets driven by

water quality and leakage considerations within capital maintenance. Also included is £200 million of investment for improvements in the consumer acceptability of water that aims to reduce the number of incidents of discoloured water.

- Water non-infrastructure investment expenditure has increased by more than £560 million, up 19% compared with that allowed at the 2004 price review. This focuses on maintaining the water quality compliance benefits achieved through past price reviews as well as funding the first time replacement of domestic meters originally installed during the mid-1990s.
- Sewerage infrastructure investment has seen an increase of more than £140 million, up 11% compared with that allowed at the 2004 price review. This focuses on maintaining improvements in service benefits for sewer flooding.
- Sewerage non-infrastructure expenditure has increased by more than £670 million, up 17% compared with that allowed at the 2004 price review. This focuses on maintaining the environmental compliance benefits achieved through past price reviews.

The overall capital maintenance increase of 21% uplift for 2010-15 builds on the 22% uplift increase we assumed at the last price review. Capital maintenance submissions have improved both in terms of the quality of evidence presented and in terms of the application of planning approaches applied through the capital maintenance planning common framework (CMPCF).

This means that in the last two price reviews, we have seen overall increases in capital maintenance expenditure of nearly 50% compared with the 2000-05 level. We recognise the need for such increases to maintain services to customers and to consolidate the benefits from previous improvement programmes. However, we must question whether we are now approaching a sustainable level of capital maintenance for the future. We recognise that the industry as a whole has improved its understanding of asset behaviour and investment needs and that the common framework approach has served the sector well, contributing to a much-improved understanding of investment needs.

As we look forward to the setting price limits in the future, we see a need to reappraise the common framework approach and develop potential improvements, particularly in the areas of risk management, programme optimisation and the balancing of service benefits. In particular, it is important that companies improve their understanding of the benefits derived from investments already delivered in order to inform future decision processes. We see a considerable difference across the industry in the unit costs of delivery of each sub-service (particularly in the areas of water infrastructure and sewerage non-infrastructure). It is unclear from current analysis whether these differences are driven by genuine asset needs or through differences of efficiency and effectiveness.

At the same time, we want to ensure that efficient and effective companies are recognised and rewarded through the price setting mechanism, while incentives are in place to encourage all companies to improve their asset management and service delivery.

We will continue to work closely with the industry before the next price review framework is implemented to develop both the common framework and the AMA approach in a timely, open and transparent way.

4.3.2 The AMA approach

We have reviewed and, where appropriate, developed the AMA approach to respond to issues identified during the price setting process. We have also taken account of emerging issues to better understand companies' expenditure and output proposals outlined in their final business plans and in their representations on our draft determinations.

We have considered carefully the issues that companies and other stakeholders have raised in relation to the AMA challenge process. For our final determinations, we have responded to these by reverting to the incentive-based calculation that we used when we set the draft CIS baseline in December 2008. We have removed the mechanism that, for our draft determinations, exposed a minimum of 25% of capital maintenance plans to an AMA challenge. This mechanism could be seen to distort incentives for those companies that had challenged themselves to contain future expenditure increases.

The additional incentive allows a company to gain recognition of additional expenditure within their baseline assessment (which depends in part on the AMA score achieved) if its proposed expenditure levels are lower than historic levels. Across all of the AMA assessed sub-services, 16 out of 62 assessments resulted in our view of the baseline capital maintenance expenditure being higher than the companies' assessment (before efficiencies were applied).

The AMA score has a range from 0 to 5 and is applied to each capital maintenance sub-service. We judged that a score of 4 out of 5 would represent a fully justified plan. Such plans would be included at 100% of all the proposed expenditure within the CIS baseline assessment. Correspondingly, scores higher than 4 would receive a greater recognition of the expenditure within the CIS baseline up to a maximum of 25% more. A score of 2 or less would indicate that a company has, in its business plan, demonstrated poor procedures and application of asset management practice, causing us to doubt the company's ability to effectively deliver within the current levels of expenditure.

Table 31 gives an overview of the range of scores we have determined across the industry and how this range translates into the AMA adjustment (or 'challenge') we have applied for our final determinations. As a result of company representations AMA scores have increased on average by between 0.17 and 0.31 in each sub-service area.

Table 32 shows the AMA scores, at sub-service level, achieved by each company. We will publish a more detailed technical overview analysis of the AMA application and its outcomes following our final determinations.

Table 31 Industry AMA scores (at sub-service level) and AMA challenge applied

		Water infrastructure	Water non-infrastructure	Sewerage infrastructure	Sewerage non-infrastructure
AMA score (4=100%)	Max	3.8	3.7	3.6	3.6
	Average	3.5	3.3	3.4	3.2
	Min	2.7	2.6	3.0	2.6
AMA challenge applied	Max	32%	35%	24%	34%
	Average	14%	18%	16%	19%
	Min	5%	7%	9%	10%

Table 32 AMA sub-service scores by company

	Water infrastructure	Water non-infrastructure	Sewerage infrastructure	Sewerage non-infrastructure
Water and sewerage companies				
Anglian	3.6	3.4	3.5	3.4
Dŵr Cymru	3.3	2.8	3.1	3.0
United Utilities	3.4	3.4	3.1	3.5
Northumbrian	3.1	3.0	3.5	3.0
Severn Trent	3.7	3.6	3.3	3.6
South West	3.4	3.0	3.5	3.0
Southern	2.7	2.6	3.0	2.6
Thames	3.5	3.3	3.3	3.3
Wessex	3.5	3.1	3.6	3.1
Yorkshire	3.7	3.6	3.5	3.6
Water only companies				
Bournemouth & W Hampshire	3.4	3.5		
Bristol	3.1	3.0		
Cambridge	3.8	3.7		
Dee Valley	3.8	3.6		
Portsmouth	3.7	3.4		
South East	3.1	3.2		
South Staffs	3.6	3.6		
Sutton & East Surrey	3.7	3.3		
Veolia Central	3.5	3.0		
Veolia East	3.6	3.6		
Veolia Southeast	3.5	3.2		
Average	3.5	3.3	3.4	3.2

4.3.3 Exceptional items

We have used the AMA approach to assess most of the capital maintenance expenditure. For the remainder, we have identified ‘exceptional items’, which are independently assessed. An exceptional item is one where either:

- the expenditure is unusual; or
- there is a discrete output in addition to serviceability parameters.

We have reviewed exceptional items separately, based on the particular characteristics of those proposals (for example, we have assessed meter renewal proposals as exceptional items across the industry, aligning our judgements with those for new meters assessed as part of supply/demand balance proposals). For some companies, we have treated maintenance on dams and large diameter trunk mains as exceptional because of their high consequence, but low likelihood and uneven nature of expenditure in comparison with past overall expenditure levels.

Many companies have promoted schemes to improve the consumer acceptability of drinking water either as an improvement in drinking water quality or as an improvement in service levels. We have taken the view that these schemes should not be viewed under either of these investment drivers, as they did not relate directly to changes in water quality legislation or demonstrate distinct improvements in service that were supported by consumer willingness to pay.

So, we have considered all drinking water consumer acceptability schemes as capital maintenance expenditure and have assessed them alongside the obligation to maintain service as part of each company's Distribution Operational Maintenance Strategies (DOMS). This has contributed to the increase in capital maintenance expenditure for the companies concerned. We have assessed these schemes either as:

- exceptional items, and stated a defined output, or, in some cases;
- as part of the expenditure assessed within the AMA process where the output for consumers was not stated or was a material improvement.

4.3.4 Transfers between capital and operating expenditure

From our analysis of companies' final business plans, it was clear that some were misinterpreting the regulatory accounting guidelines on water and sewerage infrastructure accounting. In particular, this affected operating and capital infrastructure renewals expenditure (IRE).

For draft price limits, we reallocated water service IRE to operating expenditure to correct for this for seven companies. Some companies provided additional evidence on their approach in their representations. As a result we removed this reallocation for two companies and reduced the value of the reallocation for a further two companies. We set out more detail on our assessment of relative efficiency in section 4.10.2.

At draft determinations, our primary area of concern related to water infrastructure expenditure for proactive mains repairs associated with leakage. We were concerned about evidence of possible significant changes in the level of capitalisation of costs for other components for both water and sewerage.

Having reviewed these areas for all companies since our draft determinations, we have concluded that we should make no further adjustments for our final determinations. However, as part of our accounting separation work we will be requiring companies to set out their capitalisation policies clearly, which will enable us to understand this area better. We published our requirements for this in ['Accounting separation June return reporting requirements 2009-10'](#) (October 2009).

4.4 Expenditure to maintain and improve the supply/demand balance

Table 33 summarises the expenditure we included in the CIS baseline to maintain the balance between supply and demand.

Table 33 Expenditure to maintain the balance between supply and demand

£ million (post-efficiency)	CIS baseline capital expenditure 2010-15	Additional operating expenditure by 2014-15
Water service		
Supply/demand balance (infrastructure)	957	
Supply/demand balance (non-infra)	861	
Sub-total – water service	1,818	32
Capital contributions ¹	(448)	
Net expenditure	1,370	
Sewerage service		
Supply/demand balance (infrastructure)	806	
Supply/demand balance (non-infra)	931	
Sub-total – sewerage	1,736	26
Capital contributions ¹	(433)	
Net expenditure	1,304	
Total supply/demand expenditure	2,674	58

Notes:

1. 'Capital contributions' includes receipts from infrastructure charges, developer contributions, compensation and requisition charges.
2. Totals may not add because of rounding.

In their proposals to maintain and improve the supply/demand balance, we expected companies to:

- demonstrate any need to invest to deliver the service that customers want;
- base its proposals on a thorough, integrated option appraisal, taking a broad view of the costs and benefits over the long term, consistent with their water resource management plans; and
- form a reasonable view of the costs of the preferred solution, taking into account the best available evidence, including its own recent experience.

We set out our approach to specific expenditure assumptions below.

4.4.1 Climate change and water resources

In PR09/27, 'Climate change and water resources' (February 2009), we said that we would include significant climate change-driven investment in water resources in the final CIS baseline only if it were based on robust evidence using UKCP09 scenario analysis. UKCIP published the latest scenarios in June 2009, two months after companies submitted their final business plans.

UKCP09 contains extensive data on climate change scenarios and probability assessments. Analysing this data, and identifying its implications for companies' investment plans, is a major task and it would have been unrealistic to expect the companies to complete this work and for us to take action before final determinations. So, our determinations do not take account of proposals for significant expenditure to address the impact of climate change on the balance between water supply and demand.

Companies' business plans used the outdated UKCP02 scenario analysis to measure the impact of climate change and suggested a need to invest about £1.5 billion in the period up to 2015 to address the effects of climate change on water supply and demand. Using UKCP09 scenario analysis, companies' investment requirements could be greater or less than this amount.

If companies can establish clearly and robustly that they need to invest by 2015 to address the impact of climate change, we want them to be able to do so without delay in order to maintain security of supply for consumers. On that basis, we have allowed a notified item relating to changes in water supply/demand balance arising out of the use of UKCP09. As long as companies follow the requirements of the notified item, we will take into account in an interim deterioration any material expenditure they require during 2010-15 to deal with the impact of climate change on water resources (see section 5.3).

4.4.2 Metering

We have assumed that companies will spend £470 million (post efficiency) to install 2.4 million meters over 2010-15. We have accepted most companies' projections for optional meters, challenging a minority that had failed to explain satisfactorily why their forecasts exceeded historical trends.

Companies also proposed additional metering either on change of occupier or a compulsory basis. We accepted proposals, either in full or in part, from 13 of the 17 companies that planned additional metering. On our assumptions, about 50% of households will have a meter by 2014-15, up from 37% in 2010. The largest increase will be in areas of serious water stress, where the proportion will climb to about 57% by 2014-15.

We applied a unit cost challenge to all metering proposals. We capped the capital expenditure unit costs of a company's proposals at the average that the company had experienced over the three-year period 2005-08, unless the company could justify a higher unit cost. We capped the operating expenditure unit costs at the value contained in the targets that we set for each company to maintain a balance between metered and unmetered charges.

We expected companies that proposed additional metering programmes, on top of their optional metering programmes, to demonstrate that their plans formed part of a best value approach to balancing water supply and demand. If there was no supply/demand deficit to address, we expected companies to demonstrate that the long-term benefits of their proposals outweighed the costs. We set out our approach to assessing metering in [PR09/20](#).

None of the companies was able to demonstrate that the quantified benefits exceeded the costs. However, some were able to demonstrate that the gap between quantified costs and benefits was relatively small, leaving a reasonable prospect that unquantified benefits might bridge that gap. So, we accepted companies' proposals in these cases.

We took a balanced approach in reviewing companies' CBA. For example, we made compensating adjustments if we thought that companies had overstated or understated their costs and benefits. We rejected proposals in full or in part from some companies because we disagreed with their CBA. We rejected proposals from two companies because they accepted that they were unable to demonstrate that metering would be cost-beneficial.

4.4.3 Leakage and water efficiency

We have accepted most companies' proposals to maintain existing levels of leakage, or to reduce leakage slightly. In some cases, we have challenged companies to reduce leakage by more than they proposed, while in others our analysis suggests that more modest leakage activity would provide a better value outcome for consumers. Overall, we have assumed that leakage will fall by about 3% compared with current levels.

We did not include any additional expenditure for activity to meet base service water efficiency targets. However, we have included expenditure for six companies to deliver enhanced water efficiency projects.

4.4.4 Planning for the future

In general, we think that planning is part of each company's ongoing business, so the costs of this activity should already be part of base expenditure. We have included expenditure for research projects where there is a reasonable prospect that companies need it in 2010-15 to contribute to resolving a future supply/demand deficit, but only

where it is not part of the company's ongoing business. We have excluded expenditure for contingency planning, which we consider is part of general business risk.

4.4.5 Sustainability reductions

We have included expenditure to address reductions in water abstraction driven by the Habitats Directive, unless a company is seeking compensation for the changes to its abstraction licence(s). We have not included any expenditure to address reductions driven by non-Habitats Directive requirements. In line with the policy agreed with Defra and the Environment Agency, companies should finance such schemes through the Environment Agency managed compensation scheme.

4.4.6 Water supply network reinforcement

Several companies planned to reinforce their water supply networks to maintain levels of service while distributing greater volumes of water. We included justified expenditure for this purpose, taking into account the company's case, along with the views of its reporter. We excluded expenditure that the company did not justify and its reporter did not support. In addition, we made an adjustment where there was only partial support. In cases where the available evidence supported a partial adjustment, but with no clear view as to scale, we reduced the expenditure by 25%. Unless there was a clear reason to do otherwise, we allocated 75% of network reinforcement expenditure to new development.

4.4.7 New development – water and sewerage

Companies' plans allowed for a greater number of new water and sewerage connections over this review period than they experienced between 2004-05 and 2009-10. We accepted most companies' assumptions about new connections, but we have challenged their unit costs. As for metering, we have assumed that future unit costs should normally be no greater than historic unit costs. As a result, our challenge capped the capital costs for each connection at the average costs that the company experienced over the three years 2005-06 to 2007-08, unless the company provided robust justification for greater costs in the future.

In their representations on our draft determinations, some companies argued that our cap on new development operating expenditure double-counted our cost base efficiency adjustment. This is because both challenges compared individual company costs with industry average values. We have accepted this point and have revised our cost challenge. We have also capped companies' new development unit operating costs at their proposed level less any reduction we applied to their unit operating costs for optional metering. We did this on the basis that new development operating expenditure encompasses the additional costs associated with operating a metered account, so any challenge that applies to the latter should also apply to the former.

This was a conservative challenge, which effectively accepted the remaining components of companies' proposed new development operating expenditure. In cases where companies' costs still seemed excessive, therefore, we applied an alternative challenge. This capped a company's proposed costs at one and a half times the industry average. We do not think that this alternative cost cap double counts our efficiency challenge. Even after applying this new cap, companies' costs are higher than the industry average. In effect, our cap challenges excess scope, while our efficiency assumptions challenge delivery efficiency.

We expect companies to recover from developers a reasonable proportion of the costs of new development in line with their legal entitlement. We have compared the proportion of new development expenditure that companies recover from developers through enhancement requisitions, grants and contributions, with the proportion they recovered over the three years from 2005 to 2008 (excluding connection charges and the costs recovered by those charges). We know that some companies also report contributions towards new development costs as revenue from rechargeable works, so we have included this revenue in our comparison.

We have assumed that the proportion of new development costs that companies will recover in total from requisitions and – where applicable – revenue (rechargeable works) will be the greater of:

- the proportion that the company proposed for 2010-15;
- the proportion that the company recovered over the three years 2005-06 to 2007-08, capped at 100%; or
- 50% of the gap between the historical value calculated above and the industry average over the 2005-06 to 2007-08 period.

We checked whether companies had explained why the proportion of new development costs they expected to recover in the future would differ from the proportion they recovered in the past, so that we could adjust our challenge if appropriate. We applied the adjusted recovery rate to new development capital expenditure after taking account of efficiency assumptions. We increased companies' projections for annual infrastructure charge revenue to reflect the maximum infrastructure charge for each property.

4.4.8 Operating expenditure for 2009-10 – water and sewerage

We treated supply/demand operating expenditure (excluding new development and metering) as a discrete item. We capped the 2009-10 supply/demand operating expenditure to be the same incremental amount assumed at the last price review instead of rolling forward the actual figure for 2008-09 or using the company business plan forecast.

We assessed operating expenditure separately for metering and new development, calculating the cap for those items using the unit cost assumptions that we made at the

last price review, and applying those unit costs to companies' estimates of meter and new connection numbers in 2009-10.

4.4.9 Wastewater planning expenditure

For wastewater planning, we expected companies to:

- take a central estimate of the future supply/demand position;
- consider all feasible options; and
- select the best value solution for consumers.

We recognise that this is difficult. The small sizes of sewerage catchments mean that planned development may not occur in the particular catchments companies originally expected at the outset. This means that companies then have to change their own plans accordingly. UK Water Industry Research's (UKWIR) long-term least cost planning for wastewater supply/demand provides a methodology to focus companies' plans on those areas of greatest risk, and we assessed each company's plan against this framework.

4.4.10 Sewage treatment capacity

Overall, companies plan to expand sewage treatment capacity, measured in population equivalent (PE) terms, by more than the forecast increase in population. At an industry level, we have accepted the case for this, but we have challenged individual company proposals.

Taking a balanced view of risk, we have assumed that a company will increase PE treatment capacity at the same rate that the population grows. In order to justify increasing capacity at a faster rate a company needed to provide evidence that:

- there was currently insufficient headroom;
- there would be migration within its supply area leading to increasing headroom at some works; or
- it would be more cost effective in the long term to increase capacity further.

For each company, we have limited the increase in capacity to the projected increase in population unless the company demonstrated why it needed a larger capacity expansion.

Some companies planned to increase capacity at a slower rate than the projected increase in population. We have accepted these companies' plans if we think that they can accommodate population growth within existing capacity and/or if declining industrial discharges are likely to reduce the demands on their capacity. Where such companies are simply taking a deliberately riskier approach, we have increased their expenditure by an amount sufficient to finance additional PE sewage treatment capacity at 75% of

population growth. We have not increased this to 100% because these companies may have a greater amount of spare capacity than is typical in the industry.

4.4.11 Sewage treatment unit costs

We accept that the unit costs of enhancing sewage treatment capacity will vary because of company-specific factors. However, we think that there is a limit to how great this variance should be. We have compared the unit cost of enhancing PE treatment capacity for three categories of sewage treatment works:

- less than 1,500 PE;
- greater than 1,500 PE, but less than 10,000 PE; and
- greater than 10,000 PE.

We used these categories in the 2004 price review, and the information that companies provided in their final business plans confirmed that they remain appropriate.

We have compared the unit cost of the investment that each company proposed for each category with the costs that the rest of the industry proposed. We did not think that the evidence the companies provided showed that costs should necessarily vary significantly. However, if a company conducted robust site-specific option appraisal, we allowed unit costs to vary from the rest of the industry by up to 50%.

We think that this level of variance is sufficient to reflect company-specific factors. If a company calculated costs on a site-specific basis, but did not demonstrate that it had selected a best value plan, we only allowed unit costs to vary by up to 25%. If a company calculated costs for sewage treatment on some other basis, we considered that its plan was not mature, so we capped the unit cost for each category at the average unit cost for the industry.

In their final business plans, we asked companies to separate out the costs of enhancing PE capacity at sewage treatment works from other treatment costs, such as increasing hydraulic capacity. Since these costs are associated with the same projects, we have judged that high unit costs for PE capacity are likely to indicate that other costs are similarly high. We have therefore applied the cost challenge to all treatment costs.

We applied a similar test to operating costs. We have not seen any evidence to suggest that operating costs vary significantly between different sizes of treatment works. We have therefore compared unit costs in 2014-15 for all fully operational treatment works. We have reduced the additional operating costs in the same proportions as described above for capital costs. We applied the reductions to all additional operating expenditure for sewage treatment works for 2010-15.

4.5 Expenditure to improve drinking water and environmental quality

Companies proposed investment of £1.4 billion for drinking water improvements and £4.1 billion for improvements to environmental quality. The CIS baseline allows for investment of £1.1 billion investment on drinking water and £3.4 billion on environmental quality.

We have challenged schemes that were poorly scoped, or lacked clear outputs or statutory drivers. We have done this within the context of comprehensive and clear guidance from Defra, the Welsh Assembly Government, and the quality regulators.

Our challenges are informed by the CBA that companies carried out, particularly in relation to the links made with customers' willingness to pay. We have not automatically excluded or adjusted non-cost beneficial statutory schemes, but we have used the results to indicate where we needed to look more closely at a proposed scheme. We have also used CBA to inform our decisions on proposals for discretionary investment (that is, investment without a statutory basis). Throughout the process, we have worked with the relevant quality regulator to improve our understanding of the basis for, and the interpretation of, the relevant legal obligation.

Our challenges took a number of forms, depending on the strength of the company's case (including the reporter's comments) and the views of the quality regulators. These can include specific cost challenges where the scope of a scheme had not been fully worked out or supporting evidence was lacking, through to complete exclusion where we were not convinced a case exists (for example, where there are two schemes intending to produce the same output, or where the scheme should have been completed in 2005-10). We have also capped costs, or challenged unit costs and timing where appropriate in our CIS baseline. In some cases, we have excluded schemes on a two-sided basis (as set out in section 4.2).

Tables 34 and 35 below show the capital expenditure (after efficiency assumptions), analysed by driver, to improve drinking water and environmental quality included in the CIS baseline.

Table 34 Expenditure under the drinking water quality, environmental and other obligations (post-efficiency)

	Capital expenditure 2010-15 (£m)	Additional operating expenditure by 2014-15 (£m)
<u>Water treatment</u>		
Nitrate removal – to reduce high nitrate levels caused by diffuse pollution present in sources of water used for the drinking water supply	70	1.2
Plumbosolvency control – conditioning of the water supply so it dissolves less lead from companies’ and customers’ pipework	7	0.5
Trihalomethane reduction – changes to company assets to reduce the level of by-products of disinfection to comply with water quality regulations	37	0.4
Turbidity reduction – to improve the clarity of the water supply	5	0.0*
Cryptosporidium risk reduction – required measures to companies’ assets to reduce contamination from cryptosporidium	89	2.0
Pesticide removal – to reduce pesticides levels present in sources of water used for the drinking water supply	42	0.8
Other – other work supported by DWI at water treatment works	88	1.3
<u>Water distribution</u>		
Lead communication pipe replacement – replace companies’ pipework, where necessary to help meet lead standards at customers’ taps	100	0.2
<u>Other obligations</u>		
Schemes to improve acceptability of drinking water to consumers – for example, colour, taste, odour	171	0.0*
Security and Emergency Measures Direction – schemes to protect assets and maintain supplies during emergencies	369	3.8
Water quality monitoring investigations	7	0.6
Miscellaneous	12	0.2
<u>Environmental obligations</u>		
Habitats and Birds – compliance with EU Directives through reducing water abstraction affecting valuable nature conservation sites and threatened species	47	0.3
Countryside and Rights of Way Act 2000 – reducing water abstraction affecting sites of special scientific interest	7	0.1
UK Biodiversity Action Plan – reducing water abstraction to further the conservation of biodiversity	24	0.0*
Water Framework Directive – schemes to implement river basin management plans to be approved by UK Ministers in order to meet EU WFD requirements	12	0.3
Local priority – changes to water abstraction of significant local importance	7	0.0*
Sub-total – new work identified for 2010-15	1,094	11.5

Interaction with 2005-10 quality programme		
Projects from 2005-10 to be completed in 2010-15	14	0.1
Programme for drinking water, environmental and other obligations	1,107	11.5

Notes:

* Figures shown as £0.0m because of rounding.

Totals may not add because of rounding.

Table 35 Expenditure under the environmental quality programme (post-efficiency)

	Capital expenditure 2010-15 (£m)	Additional operating expenditure by 2014-15 (£m)
Compliance with EU directives		
Urban Waste Water Treatment – upgrades to sewage treatment works to produce cleaner discharges to the environment	547	15.3
Unsatisfactory intermittent discharges – to limit pollution from combined sewer overflows, emergency overflows and storm tanks	985	11.0
Groundwater – investigations and improvements to treated effluents and intermittent discharges which may affect groundwater	104	1.9
Freshwater Fish – reduction in levels of pollutants, principally ammonia in discharges from sewage treatment works to allow more favourable habitats for fish	379	7.8
Bathing Waters Directives – investigating and improving sewage treatment works and overflows to assist compliance with EU microbiological standards	220	2.7
Shellfish Waters – reduction of microbiological pollution to ensure a suitable environment for shellfish	86	3.0
Habitats – improvements in quality of discharges to safeguard valuable nature conservation sites and threatened species	108	2.5
Water Framework Directive – schemes and investigations in accordance with the river basin management plans to be approved by UK Ministers in order to meet WFD requirements. Typically covers objectives for ammonia, phosphorus, biochemical oxygen demand and dissolved oxygen standards in rivers and discharges to groundwater	78	2.4
Water Framework Directive (Chemicals) – investigations to quantify risk from chemicals, assess catchment sources and assess treatment options	42	Nil
National legislation and policy initiatives		
Countryside and Rights of Way Act – investigations and improvements to the quality of water affecting sites of special scientific interest (SSSIs)	20	0.2
Biodiversity Action Plan – water quality improvements and studies to meet conservation targets under the UK Biodiversity Action Plan	6	nil

First-time sewerage – connecting properties to the public sewerage system to address actual or potential environmental or amenity problems caused by the existing drainage arrangements	139	1.6
Local priority – improvement schemes and studies that are of significant local importance	46	2.4
Environmental Permitting Regulations – schemes to provide first time combined heat and power (CHP) or pollution prevention measures	45	1.2
Sewage sludge management – schemes to address the impact of extending designations of nitrate vulnerable zones	116	0.8
Sustain planned level of environmental protection – improvements needed to ensure continued achievement of standards established at previous price reviews (for example, dealing with misconnections)	1	0.2
Discharge flow limit increases – schemes identified to ensure no deterioration in the current classification of water as a result of increased volumes of sewage	238	3.3
Security and Emergency Measures Direction – schemes to protect assets and assessments of further improvements needed beyond 2015.	28	0.2
Sub-total – new work identified for 2010-15	3,185	56.5
Other, including interaction with 2005-10 quality programme	207	1.7
Quality programme for the sewerage service	3,392	58.1

Note:

Capital and operating expenditure totals might not add because of rounding.

Our final price limits do not include those Water Framework Directive schemes that we judge Ministers may exclude on the grounds of disproportionate cost (see section 3.2.12). Ministers will not make final decisions on the river basin management plans for 2010-15 until December 2009. Affected companies will therefore be able to use the established mechanisms set out in the AMP5 change protocol (see section 5.3) in the event of any changes to statutory obligations that we are unable to reflect in price limits. Ministers will also confirm the final version of the NEP after we have set price limits. Companies will be able to deal with any resulting changes to investment requirements in the same way.

4.5.2 Lead in drinking water

Table 29 sets out the costs we have allowed to deal with lead problems. Our approach to this has been to continue to support plumbosolvency treatment and targeted replacement of company-owned lead communication pipes in high-risk zones, along with schemes to provide advice to customers on lead pipes. However, we have not assumed any additional (capital or operating) expenditure in price limits to replace privately-owned lead pipes (see section 3.2.11). This would represent a cross-subsidy from customers who have already paid to have their lead pipes replaced. However, we are content for companies to offer the replacement of customer pipes on a rechargeable basis where this is necessary to protect public health.

In response to representations on our draft determinations, we have excluded proposed expenditure on customer owned pipes on a two-sided basis – that is, without affecting the CIS baseline.

4.5.3 Security and Emergency Measures Direction

We have considered a number of proposals for investment relating to the Security and Emergency Measures Direction in both the drinking water and sewerage areas. We have made assumptions having discussed the schemes and costs, and particularly the phasing of work, with the relevant government authorities.

4.5.4 Catchment management

As we have explained in chapter 3, price limits include the catchment management schemes and investigations that companies proposed in their final business plans. Some of these are subject to cost adjustments, for example, where we believe companies could have done more to obtain contributions from others who will directly benefit from the work.

4.5.5 Sewage sludge management

Water and sewerage companies proposed approximately £1.5 billion of expenditure to manage the treatment and disposal of sewage sludge allocated across capital maintenance and enhancement drivers. Price limits include approximately 84% of this expenditure following challenges on:

- scope;
- estimations of growth;
- cost benefit; and
- scheme costs.

Capital maintenance expenditure allowed was also subject to the AMA challenge discussed in section 4.3.

4.6 Resilience

Most companies have proposed investment to increase their resilience of their services to external hazards. This is important because customers increasingly expect companies to provide water and sewerage services in almost all circumstances. We assess companies' resilience proposals using the following criteria.

- Why is the current level of risk to service unacceptable?
- Is the proposed new level of risk to service clear and justified?
- Are the benefits expressed in terms of consumer service?

- Have a number of options been considered and subjected to robust CBA?
- Have the impacts of climate change been considered?

We also expected to see clearly sustainable plans that were consistent with the long-term aspects of companies' overall strategic aims. We set out our approach to resilience in [PR09/12, 'Asset resilience to flood hazards: development of an analytical framework'](#) (June 2008).

We considered proposals based on the above criteria. In situations where a case was not fully made, we challenged all or part of the expenditure. In the latter case, we reduced proposed expenditure by either 15% or 25% based on our view of the areas of weakness within the proposals. In total, we included £414 million in price limits for resilience schemes.

4.7 Renewable energy

A number of water and sewerage companies included proposals in their final business plans for renewable energy generation projects. These proposals are part of wider activities to reduce carbon emissions. Reducing carbon can also deliver long-term cost savings for consumers. We considered the following questions as we assessed companies' proposals.

- Do the proposals fit with an overall strategy?
- Have technology maturity and risks to delivery been considered?
- Has the company described the outputs for operational expenditure savings for consumers?
- Have Renewables Obligations Certificates (ROCs) been accounted for?
- Has the CBA case been justified on a "spend-to-save" basis?
- Is there any double counting between consumers' willingness to pay, the shadow price of carbon and income from ROCs?

We challenged proposals against these criteria. If a company did not make a compelling case, we challenged all or part of the expenditure. In the latter case, we applied a challenge to expenditure of either 15% or 25% based on our view of the areas of weakness within the proposals. We included £57 million in price limits for renewable energy proposals, which will deliver more than £20 million in operational costs savings over 2010-15, with continuing benefits in subsequent years.

4.8 Enhanced service levels

4.8.1 Sewer flooding

Price limits will enable sewerage service providers to continue to make progress to reduce the risk and incidence of sewer flooding. Within the CIS baseline we have assumed investment of £1,157 million (see table 36) of expenditure compared with company proposals of £1,579 million.

Table 36 Sewer flooding expenditure

Company	Company proposal			Final determinations		
	Expenditure to reduce the risk of flooding internally at least once in 10 years £m	Expenditure on other sewer flooding outputs £m	Total £m	Expenditure to reduce the risk of flooding internally at least once in 10 years £m	Expenditure on other sewer flooding outputs £m	Total £m
Anglian	66.7	11.4	78.0	45.3	10.1	55.5
Dŵr Cymru	29.1	46.3	75.4	29.0	46.3	75.3
Northumbrian	124.0	2.0	126.0	119.3	0.9	120.1
Severn Trent	124.1	79.0	203.1	113.0	44.5	157.5
South West	17.8	6.1	24.0	19.4	6.5	25.9
Southern	44.5	140.0	184.4	21.0	58.1	79.1
Thames	367.8	87.4	455.2	257.5	67.8	325.4
United Utilities	98.2	57.2	155.4	93.2	33.7	126.9
Wessex	16.4	32.3	48.7	17.4	33.1	50.5
Yorkshire	78.3	84.4	162.7	73.6	67.1	140.7
Industry total	966.9	546.0	1,512.9	788.6	368.2	1,156.8

In assessing the companies' final business plans, we have made four broad challenges to their proposals.

- **Cost-benefit analysis** – we have not applied a rigid cost-benefit test at scheme level, but we have taken account of wider evidence on customer priorities and willingness to pay alongside CBA evidence. We have excluded programmes aimed at 1-in-20 year, or external flooding risks, if they have poor CBA or willingness to pay evidence.
- **Forecast new sewer flooding problems** – we have challenged companies' forecasts of newly emerging sewer flooding if they were not well justified, especially if higher than the five-year average for net additions.

- **Major scheme challenges** – we have removed or reduced the scope of schemes where there was no or limited information about costs, benefits or where we felt the level of risk reduction proposed did not appropriately balance the risk between company and customer.
- **Reduction in high risk of flooding** – we asked two companies to develop their proposals so that there was a larger reduction in the numbers of properties on the high-risk registers.

Price assumptions include capital expenditure of £789 million to reduce the number of properties at high risk of sewer flooding and respond to newly emerging problems.

4.8.2 Other service enhancements

Before concluding that customers should pay for the projects proposed, we checked that the companies had demonstrated:

- the need for improvement;
- consumer support for the improvement (through willingness to pay);
- an indication of the priority consumers attach to it;
- evidence that the proposed solution is cost beneficial; and
- clear and measurable outputs.

Price limits include an assumption of £11.8 million to address localised problems with the taste and odour or pressure of drinking water.

4.8.3 Odour from sewage

Water and sewerage companies proposed just over £120 million of expenditure to tackle issues of odour at sewage treatment works and pumping stations. Price limits include approximately 90% of this expenditure following challenges on scope, cost benefit and scheme costs.

4.8.4 Pollution incidents

In addition to the cost allowed within price limits under the quality programme, water and sewerage companies proposed just over £80 million of expenditure to tackle issues of pollution from the sewerage system to watercourses and rivers as enhanced service improvements. Price limits have allowed approximately 90% of this expenditure following challenges on scope, cost benefit and scheme costs.

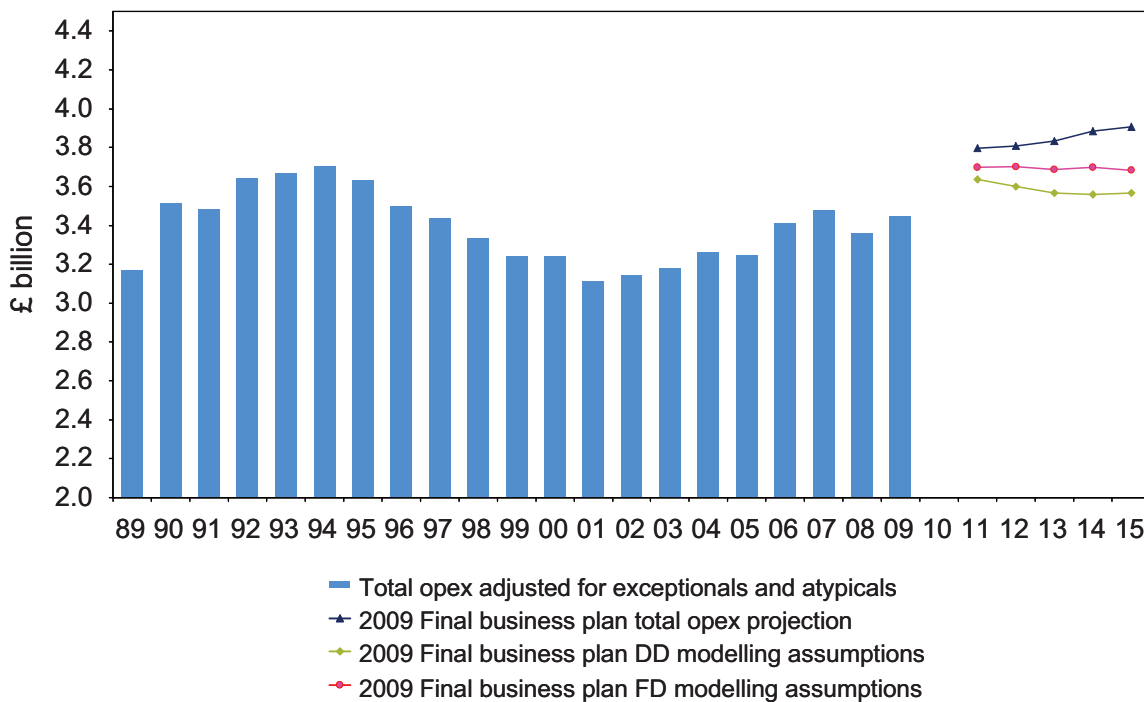
4.8.5 Revised Bathing Water Directive and bathing water improvements

One company proposed additional expenditure for the revised bathing water programme to achieve the ‘Excellent’ standard at a number of beaches. We included expenditure where proposals are cost beneficial.

4.9 Operating expenditure

Figure 11 shows the trends in operating expenditure since 1989. It also shows the projections we have assumed in price limits and the assumptions that the companies made in their final business plans. Each company will incur this expenditure in the day-to-day running of its business – including wages, chemical costs, energy costs, business rates, and licence fees.

Figure 11 Industry operating expenditure since 1989



Price limits assume that in 2015 the base operating expenditure needed to deliver services to customers will be 1.2% higher than current levels (2008-09). Our final determination assumptions for operating expenditure start with each company’s operating expenditure in 2008-09 as reported in their June returns. We applied company-specific efficiency challenges based on our analysis of companies’ relative efficiency in 2008-09. In addition we need to allow for the operating expenditure needed to deliver improved quality standards, to meet increased demand for water, and to improve customer service standards are included. This means that the total operating

expenditure for 2015 increases by about 7% compared with the current level. Companies had asked for an increase of 13%.

Figures 12 and 13 show the main components of the change in operating expenditure between 2008-09 and 2014-15. The figures show that the increase in operating expenditure is partially offset by our efficiency assumptions. Figure 13 provides a breakdown of the increases in operating expenditure by type.

Figure 12 Key drivers of operating expenditure by 2014-15

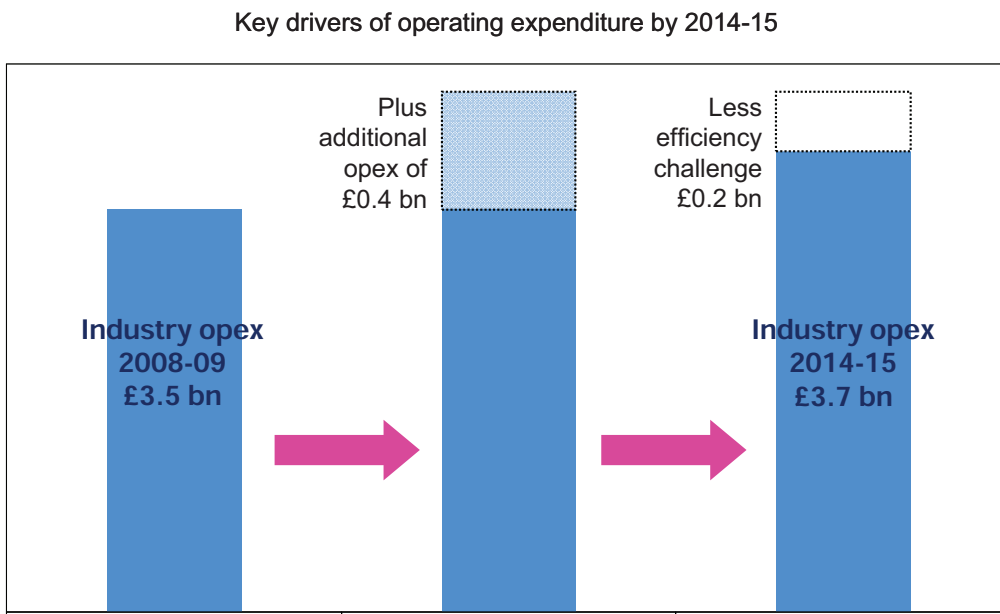
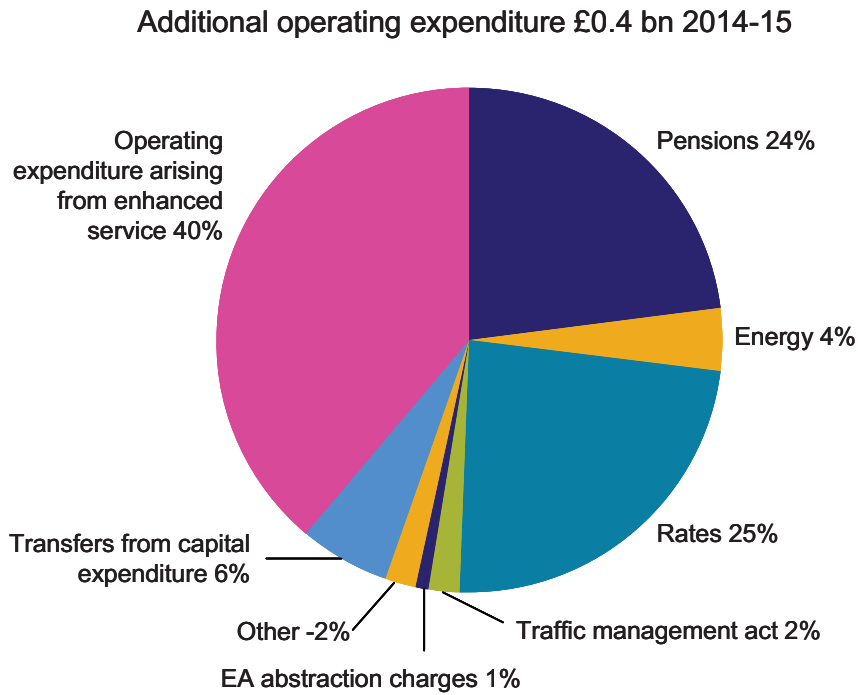


Figure 13 Additional operating expenditure 2014-15



The 'other' category is negative because it includes spend to save outputs

Table 37 sets out our assumptions for each company for operating expenditure. It shows operating expenditure for the water and sewerage services separately and on a £/property basis.

Table 37 Operating expenditure by company (annual average post-efficiency)

	Operating expenditure (annual average) 2010-15					
	Water	Sewerage	Total	Water	Sewerage	Total
	£m	£m	£m	£/property	£/property	£/property
Water and sewerage companies						
Anglian	172	221	394	86	86	172
Dŵr Cymru	129	115	244	97	85	181
Northumbrian	164	85	248	85	71	157
Severn Trent	251	246	497	75	64	139
South West	73	71	144	94	101	196
Southern	75	143	218	72	77	149
Thames	327	301	627	91	54	146
United Utilities	253	240	493	83	79	162
Wessex	58	88	145	100	76	176
Yorkshire	163	150	313	77	71	149
WaSC total	1,665	1,658	3,323	84	71	156
Water only companies						
Bournemouth & W Hampshire	17		17	88		88
Bristol	45		45	90		90
Cambridge	11		11	86		86
Dee Valley	11		11	88		88
Portsmouth	19		19	61		61
South East	79		79	90		90
South Staffs	42		42	78		78
Sutton & East Surrey	26		26	95		95
Veolia Central	104		104	83		83
Veolia East	7		7	90		90
Veolia Southeast	8		8	114		114
WoC total	370		370	85		85
Industry total	2,036	1,658	3,694	84	71	156

Most of the increases in expenditure that the companies asked us to consider were in certain areas such as:

- pensions;
- energy costs;
- business rates; and
- bad debts.

We discuss these and other areas further below.

4.9.1 Energy costs

Changes in energy prices are just one of the many business risks that companies face. We have considered our approach to energy alongside the other risks, the mechanisms we use for handling uncertainties and, more broadly, the cost of capital we set. Eleven companies included increases in energy costs in their final business plans, with individual company increases (compared with 2008-09) ranging between 1% and 16% of operating expenditure by 2014-15 and a total increase of £20 million by 2014-15.

While some companies asked us to put a notified item or a cost pass through mechanism in place to guard against future increases in energy costs, we continue to believe that this is not necessary for two key reasons.

- Changes in energy prices are a risk that RPI indexation partly mitigates.
- The base operating expenditure figure we take forward from 2008-09 into price limits already includes energy costs at a level we think is appropriate for many companies.

However, we have looked again at the base year energy costs both in light of company representations on our draft determinations and future energy prices. If companies have procured effectively and their base year (2008-09) energy costs are very low, then we have included a specific increase to their costs. We did this at the draft determination but we have increased the unit rate for energy from our draft determination assumptions. This means that 11 companies (three water and sewerage companies and eight water only companies) now receive an higher energy cost assumption compared with four companies at draft determinations.

We continue to believe that the companies themselves can manage any remaining risks related to energy costs through effective usage and price management, including hedging. The approach that a number of companies have taken, both in the current price review period and in their business plan strategies for managing energy price volatility, supports this view.

We have also changed our approach from draft determinations to the treatment of energy costs in our assessments of relative efficiency. We did not adjust our assessments of relative efficiency for this uplift in energy costs in the final price limits. We believe that this maintains incentives for companies to continue to procure effectively as they will see the benefit in their operating cost relative efficiency assessment.

4.9.2 Pensions

Companies' pension arrangements are a matter for their managers, but in setting price limits, we need to enable efficiently managed companies to finance their functions. This includes the cost of providing pensions as part of their remuneration arrangements. Most companies provide 'final salary' pension schemes (known as 'defined benefit schemes')

for their current employees, although almost all have decided not to offer them to new employees.

Meeting the liabilities to past employees and the expectations of current employees is a significant cost for the companies. When we set price limits in 2004, we made an assumption for increased costs to address pension scheme deficits if the companies had soundly-based proposals. Despite this, recent financial events, increasing longevity and changes in accounting rules means the cost of defined benefit schemes are rising significantly.

Because of changes in the way companies account for their pension costs, it is more appropriate to consider the cash contributions they have made in the period 2005-10 and the projected cash contributions for 2010-15. The companies charged £89 million of pensions costs in their regulatory accounts for 2008-09. This is significantly less than the total cash contributions of £200 million made in that year. Although the accounting charge is broadly similar to the ongoing service contributions, the companies are also making deficit recovery payments of about £92 million. Therefore, we asked companies to use the cash contributions agreed with pension scheme trustees as the starting point for their pension projections for 2010 onwards.

In our draft determinations, we allowed in full the projected ongoing service contributions based on the most recent actuarial valuations for each scheme. In addition, we included half of the deficit from the most recent scheme valuation assuming recovery of the deficit over a ten-year period.

All companies have now asked us to consider higher operating expenditure assumptions for pension costs. Companies' business plans included a total of £263 million a year of pension contributions for 2010-15, (compared with £89 million in 2008-09 as noted above). This has increased to £305 million following updated information in companies' representations.

In their business plans, companies argued that they need increases to meet future funding requirements (based on the recent financial performance of the pension funds and assumptions about the longevity of pension scheme members). Some companies also asked us to reflect an additional amount, over and above the deficit recovery payments agreed with trustees, to take account of the most recent changes in the market values of scheme assets.

Other companies took the view that customers should not fund in full the recent fall in equity values (which has a significant impact on the scheme funding and deficit position) at this price review. Two companies concluded in their business plans that, consistent with the approach we took in 2004, customers should fund only 50% of any deficit recovery payments. One further company has accepted this as part of its representations to us on our draft determinations.

About two-thirds of companies raised the treatment of pension deficits in their representations on our draft determinations. In particular, companies asked us to reflect more recent market movements, which have increased deficits since the last agreed valuations. They also raised the need to finance 100% of deficit contributions (rather than the 50% we assumed in our draft price limits).

In general, companies have projected that funding deficits will be recovered over periods ranging from 7 to 20 years. A number of companies have chosen a ten-year period. They believe this is consistent with the period that the Pensions Regulator has set as one of its trigger points for a review of a scheme's recovery plan. Others have signalled in their representations that 15 years may be more appropriate.

We have included £211 million a year of pension contributions by 2014-15 in our final determination compared with £184 million in our draft determinations. We have allowed in full the projected ongoing service contributions based on the most recent actuarial valuations for each scheme.

We would normally base our analysis of pension costs on the most recent triennial valuation since this would provide the most robust evidence on pension deficits. However, the recent volatile market conditions mean that such valuations could quickly become out of date. Consequently, in looking at deficit recovery payments, if companies have raised the issue of later valuations in their representations, we have taken into account updated actuarial information.

In our final determinations, for schemes that have a date for a full actuarial valuation:

- after March 2008, we have based our projections on that valuation. We have allowed half of the deficit recovery (assuming recovery of the deficit over a minimum of ten years); and
- of March 2008 or earlier, we have taken into account updated actuarial information and reflected the more recent deficit positions. We have included half of the deficit recovery (assuming recovery of the deficit over a minimum of 15 years).

We have used a 15-year period for these later deficit positions because they arguably reflect the worst of the market decline and therefore capture deficits at their highest point. In addition, they are based on funding or actuarial updates that reflect only the market movement. They do not consider the full range of actuarial assumptions or reflect a position that has been agreed with trustees. Three companies have used a 15-year period in the updated pension costs they have set out in their representations.

We have continued to allow half of the deficit recovery similar to the approach we took in 2004. We consider, for the five-year period 2010-15, that this reflects an appropriate balance between the amount which customers should fund now and that which may be funded through other mechanisms (including the scope for market recovery). We

consider that our approach provides strong incentives for companies to continue to manage their pension costs effectively. Two companies accepted this approach in their final business plans. In addition, some other companies have acknowledged shareholders' role in financing pension deficits in their representations.

We recognise that funding pension deficits is a long-term issue. We will therefore review and invite comment on the treatment of these costs (including proposals such as the addition of deficits to the RCV) after the price review. This will inform our approach for future price limits.

4.9.3 Customer debt

In their final business plans, companies proposed a range of approaches to bad debt costs, their main concern being the impact of the current economic climate. Most proposed continuing a notified item. A number also sought to include increased costs typically in line with their proposed bill increases.

We said in our [methodology paper](#) that we did not see any compelling reason to continue the current notified item on the costs arising from bad debts beyond 2010. Companies now have more experience and we can expect them to forecast and manage their bad debt position more effectively. We maintained this position for our draft determinations, but said that we would take a final view on the need for a notified item for bad debt in our final determinations.

The long-term trend in companies' debt charges as a percentage of turnover and the debt related costs per customer has been relatively stable since 2003-04. We think that it is important to retain strong incentives on the companies to improve their collection of the revenue that is due to them. Many companies report that they are becoming more effective at collecting current bills but have difficulties with longer-term debtors. More companies are adopting good practice and innovative approaches to debt, for example using more targeted debt recovery techniques made possible through effective customer segmentation, or introducing social tariffs where they prove to be self-funding.

Price limits roll forward the costs incurred by companies during 2008-09 (excluding exceptional items) and will therefore reflect both the level of bills in 2008-09 and the difficult economic conditions at that time.

We believe that providing for the continuation of 2008-09 costs, together with continued improvement in revenue collection would, under normal economic circumstances, mean that companies are able to manage bad debt as a normal business risk. The Walker review has supported recommendations that we and the companies put forward for changes to legislation, which if implemented would make it easier for companies to collect revenue. By not increasing bills for many companies, our price limits will avoid adding to debt levels in the way companies forecast.

The main continuing risk relates to the duration of the current economic climate and its impact on customers' payment of their bills after April 2010. We have considered a range of recent evidence, including independent forecasts of economic measures and the extent of increases in unemployment. We do not consider it appropriate to assume in price limits that debt related costs will increase. However, we accept that, in the current economic climate, a notified item for bad debt will ensure that our price limits reflect a fair balance of risk between companies and their customers. The notified item will relate to increases in household debt costs resulting from worsening economic circumstances in the company's operating area. We expect companies to continue to manage commercial debt as a normal business risk.

A company wishing to make use of the notified item will need to demonstrate that it proactively applies a best practice approach within a coherent strategy to maximise cost-effective revenue collection. When considering any applications for interim determinations, we will carry out a holistic review of areas such as:

- tariffs;
- billing;
- revenue recognition;
- bad debt provisioning;
- collection policies and practices; and
- links to base year efficiency assessments.

4.9.4 Business rates revaluation

The Valuation Office Agency (VOA) carries out a revaluation of all non-household rateable values in England and Wales every five years. The next revaluation is due to come into effect on 1 April 2010 and all non-household properties will have their rateable value assessed by reference to levels of rental value as at 1 April 2008.

The VOA assesses water and sewerage service rateable values using different methods. This means that the impact of the rating revaluation on future business rates costs will be different for each service. We did not assume any increase in sewerage rates at draft determinations. Since then, the VOA has published updated rateable values for both the water and sewerage services and an updated view of the English and Welsh poundages. We recognise that there will be a material change in sewerage rateable values, and we have therefore taken account of this in our final determinations.

Our work with the VOA shows that most companies will face higher costs for rates. For the final determinations, we have assumed that the costs of rates for the water service will increase in aggregate by about £78 million by 2014-15, and for the sewerage service we have assumed an increase of about £28 million by 2014-15.

4.9.5 Costs relating to the introduction of competition

We have made no assumption about costs relating to introducing competition. We consider that a company with flexible accounting systems and processes should be able to accommodate changes relating to the introduction of competition, such as work on accounting separation. Any additional cost, in general, should not be material. However, we recognise that new legislation may lead to competition related costs that may affect companies. This may qualify as a relevant change of circumstance and if material may trigger an interim determination (see section 5.3.1).

4.9.6 Adoption of private sewers

We have not included in price limits any expenditure relating to the transfer of private sewers and lateral drains that Ministers have signalled will take place from 2011. As requested, companies excluded such costs from their final business plans pending further clarification on the timescale and scope of the transfer. This should become clearer during the drafting of the regulations giving effect to the transfer. As stated in chapter 5, companies will be able to seek recognition of significant financial costs arising from the transfer using the interim determination mechanism.

4.9.7 Traffic Management Act

The Traffic Management Act 2004 has allowed highways authorities to implement permit schemes for works and other activities in the street since April 2008. At present, there remains considerable uncertainty over the take-up of permit schemes. This makes it difficult for companies to assess the future impact of these schemes on their costs. As a result, we have not increased the operating expenditure allowed in price limits for these costs, except where permit schemes are awaiting approval and there is a high degree of certainty that companies will incur additional costs. However, we have included a notified item as part of our final determinations to cover the costs of permits. This will allow companies to recover the costs as part of an interim determination (see section 5.3.1).

4.9.8 Increases in abstraction charges

Abstraction charges levied by the Environment Agency could increase at a faster rate than inflation to finance the costs of revoking or modifying abstraction licences where there is a demonstrable adverse impact on the environment.

In their final business plans and representations on our draft determinations, companies asked us to take account of the Environment Agency's future indicative increases in abstraction charges. The uncertainty about future increases has meant that we have been unable to include allowances in the environmental improvement unit charge component of abstraction charges (the part of the abstraction charge levied to fund the Environment Agency's compensation scheme). However, we have included a notified item as part of our final determinations to cover any changes in the environmental

improvement unit charge component of abstraction charges other than the change arising from RPI.

4.10 Future efficiency

When we set price limits, we include incentives for companies to improve their efficiency over time. Our overall efficiency assumptions have two components.

- **A catch-up improvement factor that challenges a company to make progress towards the top performing companies.** For operating expenditure, this is explicit; for capital expenditure, our approach builds the comparative efficiency challenge into the CIS ratio, which is structured around a central estimate of efficiency based on a middle ranking company.
- **A continuing improvement factor linked to the improvement that we could expect from the leading or frontier companies.** This applies to both operating and capital expenditure.

In reaching our views on the scope for future efficiency, we have considered how costs and productivity will change in the next price review period. We have taken advice from consultants with expertise in this field, which we published in [PR09/28, 'Scope for efficiency studies'](#) (February 2009). We have also considered:

- each company's views in its business plans on the scope for future efficiency;
- the significant future capital programme included in price limits; and
- the additional operating costs we have included in price limits.

In their representations, companies argued that our view on continuing efficiency was not supported by the advice on the scope for efficiency carried out for us and the separate study undertaken for Water UK. We disagree. We considered these studies alongside other evidence and they informed our overall view. We also looked again at the studies, which we discuss below.

Since publishing PR09/28, we have looked again at our conclusions in light of current economic circumstances. We did this for draft determinations and again for final determinations, taking account of latest economic data. We considered trends in both future productivity and input prices, and how these would impact on the scope for future efficiency.

We looked particularly closely at trends in labour costs as these form significant but different proportions of the industry's input costs for both operating and capital expenditure. We have taken a different view of the scope for continuing efficiency for operating and capital expenditure, which in part reflects the different mix of input costs and different views on future productivity for each type of expenditure.

We have included in price limits challenging assumptions of future efficiency savings over and above those achieved in the economy as a whole. We have concluded that there is still scope for the best performing companies to make further real efficiency improvements. For operating expenditure, we have taken into account the scale of the future capital programme and the opportunities this presents for delivering operating expenditure efficiencies. Our analysis of each company's relative efficiency highlights two things.

- There is still considerable variation in performance.
- The leading companies have continued to improve their performance.

4.10.1 Continuing operating expenditure efficiency

We have assumed a continuing efficiency improvement factor of 0.25% a year for both water and sewerage base operating expenditure. We have revisited this assumption since draft determinations, but our view remains unchanged.

For enhancement operating expenditure, we have included factors one and a half times that for base expenditure. This reflects both the historical trend of substantial outperformance of our assumptions in this area and the greater scope for efficiency when operating new and enhanced assets.

4.10.2 Relative operating expenditure efficiency

The efficiency catch-up factor for base operating expenditure assumes that a company will close 60% of the assessed efficiency gap to the frontier performance by 2014-15, with equal improvement steps in each year. For enhancement operating expenditure, we have assumed one and a half times the base catch-up factors.

For our final determinations, we have used our 2008-09 assessments of relative operating expenditure efficiency. Table 33 sets out the assessments of relative operating expenditure efficiency. We have also adjusted the modelled operating expenditure to:

- reallocate leakage costs from infrastructure renewals expenditure to operating expenditure for five companies (see section 4.3.5), and from other capital expenditure to operating expenditure for one company; and
- change the basis of the pensions adjustment from a charge to a cash basis (see section 4.9.2).

We have made these changes to ensure consistent treatment of costs between companies. In a change from our draft determinations, we have not adjusted our efficiency assessments for energy costs. We discuss this further in section 4.9.1. We have also revised our adjustments for special factors for some companies to take account of their updated 2008-09 costs where material together with information in companies' representations. We have also chosen the benchmark company for each

service carefully to ensure that the cost structure of the benchmark company is representative of the industry.

The catch-up factors range between 0% and 2.9% a year for water and 0% and 2.2% a year for sewerage. Table 38 shows the efficiency bands used for our final determinations. At the 2004 price review, we saw a clustering towards best performance and a major improvement in relative efficiency since the previous price review in 1999. We introduced enhanced incentives at the 2004 price review to stimulate the leading companies to improve their efficiency. Our relative efficiency analysis suggest that the leading companies have continued to improve their efficiency, and that the gap between the most and the least efficient companies remain similar to that at the last price review.

Table 38 Relative operating efficiency bands for final price limits

	Water	Sewerage
	Band (range A to E)	Band (range A to E)
Water and sewerage companies		
Anglian	A lower	B upper
Dŵr Cymru	C lower	C upper
Northumbrian	B upper	C upper
Severn Trent	B upper	A lower
South West	B lower	B lower
Southern	A upper	B upper
Thames	B upper	A upper
United Utilities	B upper	C upper
Wessex	B upper	A upper
Yorkshire	A upper	A lower
Water only companies		
Bournemouth & W Hampshire	B upper	
Bristol	B upper	
Cambridge	C upper	
Dee Valley	B upper	
Portsmouth	A upper	
South East	A lower	
South Staffs	A upper	
Sutton & East Surrey	A lower	
Veolia Central	C lower	
Veolia East	B upper	
Veolia Southeast	C upper	

4.10.3 Incentive allowance for operating expenditure

We introduced the operating expenditure incentive allowance in 1999 as a formal incentive mechanism to allow companies to retain, for a minimum of five years, the benefit of incremental outperformance of our expectations of operating costs. At the last price review, we introduced an outperformance multiplier. This improved the outperformance rewards, for both operating and capital expenditure for those companies

that we assessed as leading. We set out how this would operate in [PR09/04, 'The opex incentive allowance and the outperformance multiplier for 2005-10'](#) (October 2009).

For the water service, seven companies receive an incentive allowance, including five companies that also receive enhanced outperformance rewards. For the sewerage service, three companies receive an incentive allowance with two of these also receiving enhanced outperformance rewards.

4.10.4 Capital efficiency

For our final determinations, we have used the cost base as our primary determinant of capital maintenance and capital enhancement efficiency.

Our assumptions on future capital efficiency are in two parts.

- A single continuing efficiency assumption that is the same for every company.
- A company-specific relative efficiency assumption compared to that of a middle ranking company.

Our approach for relative capital efficiency needs to be viewed in the overall context of the CIS incentive mechanism, which challenges and incentivises companies in a new way (see section 4.2). Efficiency challenges are with respect to a median point in the distribution, rather than a 'frontier' benchmark approach, as we have used in previous price reviews.

If we ignore other elements of the CIS (such as the additional income adjustments) and focus simply on the efficiency challenge built into our assumptions, the total assumption for efficiency gains in the CIS baseline is significantly lower than under a frontier approach. This gives greater scope for companies to outperform the CIS baseline assumptions. We estimate that a frontier approach would have resulted in an efficiency challenge of up to £1.5 billion more across the industry in 2010-15.

4.10.5 Continuing capital efficiency assumptions

We have assumed continuing efficiency improvements for all companies of 0.4% a year for all capital expenditure incurred during 2010-15; for the 2015-25 period, we have assumed 0.25% a year; beyond 2020 we have assumed no continuing efficiency. We have taken a more conservative view of the scope for continuing efficiency after 2015 to reflect the greater uncertainty in predicting costs and productivity further into the future. We discuss our approach to continuing efficiency in section 4.10.

4.10.6 Relative capital efficiency assumptions

During price reviews, we use the cost base comparative tool to assess relative efficiency in procuring and delivering capital projects. We do this by comparing company estimates

of capital works unit costs for a representative range of standardised capital projects (standard costs).

Each company provided us with draft and final audited estimates for the standard costs based on, as far as possible, its own current and previous capital works programmes. These estimates were subjected to focused independent audit and review by the reporters.

With assistance from our cost base consultants, Jacobs Engineering, we have carried out a detailed assessment and review of the companies' and reporters' reports for each submission. We have issued queries where we have questions about the compliance with our reporting requirements and the comparability between companies. We published a feedback report on companies' draft cost base standard costs in [PR09/16](#), 'Cost base feedback report' (August 2008).

Our concerns at draft business plan stage related to compliance and consistency. This prompted us to strengthen our approach to reviewing the standard costs in the final business plan. Accordingly, our consultants visited each company with the objective of ensuring that the most material differences between companies were explored and any inconsistencies in the composition of standard costs were identified. We published an executive summary of the key findings and conclusions from this review in [PR09/34](#), 'Executive summary: findings from the cost base audits (March–May 2009)' (August 2009).

Our overall approach for final determinations remains unchanged from that set out in PR09/16. For each standard cost, we have:

- looked at the data distribution;
- identified a fixed cost for comparison; and
- measured how far proportionally above or below this, each company's standard cost is.

We have selected the median value as representing this fixed cost.

For infrastructure, we weight each of these proportional distances from the median values by the forecast proportions of capital investment planned for the 2010-15 period. For mains and sewers, we are able to reflect the composition of each company's asset stock in this weighting. For non-infrastructure, the link between existing assets and future work is less clear, so for each asset group (such as water treatment works) we take a simple average of the proportional distances above or below the median values in this area and weight this by the associated forecast proportion of capital investment.

For mains, communication pipes and sewers we use 100% of the difference to the median value to contribute to overall efficiency. This reflects the confidence we have in the consistency and comparability of these standard costs due to the regular activity

undertaken on these assets. For all other assets, we use only 50% of the difference because we have less confidence in the comparability of these standard costs. Activity on these tends to be less frequent and companies often provide estimates based on quotations and/or costs associated with a relatively small number of schemes.

Changes in the cost base since draft determinations

We reviewed the comments made in Jacobs' executive summary in [PR09/34](#) and on their advice, changed our approach to household meters.

For household meters, the horizontal audit highlighted differing approaches to deriving these standard costs. The discussions with companies revealed that while some carry out large-scale programmes of meter installation others do this work as reactive one-off installations. Jacobs considered that a sizeable element of the variance in standard costs was not related to efficiency in delivery of similar work. For our final determinations, we have therefore used only 50% of the difference to the median value for these assets as opposed to the 100% that we used at the draft stage.

We also excluded the standard costs for 'Replacement UV disinfection' because Jacobs considered this particular item was not helping to inform the cost base process as a result of being predominantly based on quotations that were not well aligned to outturn costs.

We also removed the standard costs for 'installation of denitrification'. The low number of costs submitted suggests that this process was not sufficiently widespread to provide a useful standard cost in the analysis.

We carried out a detailed review of the issues and comments that companies and reporters made on cost base and capital efficiency in their representations.

The two main issues identified in the representations were the:

- justification for our continuing efficiency assumptions explained in section 4.10; and
- use and application of the BCIS index which we discuss below.

Many issues were company specific in nature affecting individual standard costs, but four companies (Portsmouth, Southern, Veolia East and Veolia Central) proposed revisions to their standard costs set out in their final business plan submissions.

To be fair to all companies and to maintain the integrity of the whole process, in determining whether to make any changes to cost base submissions for our final determinations, we considered the merit of any argument. We then considered whether there was supporting evidence for any changes.

We accepted a limited number of revisions from one company on the basis that it presented persuasive arguments supported by strong evidence. We considered it proportionate to do this. We did not progress other requests for changes, as they did not meet the criteria set out above.

We will publish a report on the companies' final cost base standard costs in December 2009.

Regional price adjustment

We reviewed the concerns raised by some companies in their business plans about the appropriateness of the Building Cost Information Service (BCIS) index. While we note that the basket of construction projects used to generate the index was developed primarily for the building industry, we maintain that it is still appropriate for use in the cost base, since we are using it to reflect regional differences in labour and material costs.

We have reviewed whether regional differences in labour and material costs are comparable across different construction industries and conclude that while the actual costs may vary, the regional differences are comparable. We have therefore continued to use the BCIS index to assess the regional variation in construction prices from the England and Wales average. We weight local indices by population to obtain average figures for each company's area and the whole of England and Wales. We then compare each company's index figure to the England and Wales average.

For our final determinations, we have made two significant refinements to our approach based on the representations of some companies.

- The first refinement involves using a five-year average index from 2004-05 to 2008-09 instead of the index for 2007-08 only. This takes account of the movements in the BCIS index over time and reflects the variations in construction prices over the same AMP4 period from which companies have compiled the unit costs used to derive their standard costs.
- The second refinement concerns the proportions of each standard cost that we consider are affected by regional prices. We acknowledge that regional prices affect companies' costs and expenditure, and are to some extent outside management control. But some items, such as mechanical and electrical equipment and design services, are procured in a national market. Therefore, regional prices affect only part of capital costs. For our final determinations, we have carefully considered some companies' arguments that our proportions were not fully applicable to the activities of the water industry. We have reviewed our approach in detail, using a greater granularity of cost breakdown information specific to water industry costs. We have also considered the size and location of the company in our assessment through a series of tests and hypotheses for each cost element.

Table 39 summarises our view on the proportions of standard costs affected by regional prices in our final determination cost base analysis. For comparison, we also show our assumptions for draft determinations.

Table 39 Proportions of standard costs affected by regional prices

	Draft determination	Final determination				
		All companies	Large company		Small company	
			Low cost region	High cost region	Low cost region	High cost region
Water service						
Mains	70%					
Communication pipes	74%	43.1%	66.2%	36.2%	65.3%	
Household meters	58%					
Water treatment works – surface	54%					
Water treatment works – ground	74%	33.5%	54.2%	27.4%	69.4%	
Service reservoirs	82%					
Water pumping stations	38%					
Sewerage service						
Sewers	70%	43.1%	66.2%			
Sewer structures	82%					
Sewage pumping stations	38%					
Sewage treatment works	50%	33.5%	54.2%			
Sludge	74%					

All companies have benefited from this revised element of our approach. We believe our application of the BCIS regional price indices better reflects the characteristics of the water industry and the individual circumstances of each company. We will publish further details on our assessment in our cost base feedback report in December 2009.

Table 40 provides an overview of the combined cost base and continuing efficiencies applied and the impact of these on industry capital expenditure.

Table 40 Overall capital expenditure efficiency challenge

	Efficiency challenge (£m)	% of capital expenditure
Water	+4	0.0%
Sewerage	-367	-2.8%
Total	-363	-1.6%

As set out in section 4.10, the aggregate capital efficiency assumed at this review of £363 million is considerably less than the £1.7 billion accruing from the approach used at the last price review. Tables 41 and 42 provide a summary of the cost base relative efficiencies applied for each company for each sub-service.

Table 41 Capital expenditure efficiency adjustments

	Water		Sewerage	
	Infrastructure	Non- infrastructure	Infrastructure	Non- infrastructure
Simple mean	+0.4%	-2.8%	+0.6%	-0.5%
Most efficient	+17.6%	+8.6%	+15.8%	+13.2%
Least efficient	-17.4%	-15.4%	-10.2%	-11.1%
Standard deviation	+10.5%	+6.2%	+8.6%	+8.5%

Note:

A positive number means a company is relatively efficient, so we have made a positive adjustment in setting the baseline and vice versa.

Table 42 Catch-up efficiency factors arising from the cost base

	Water		Sewerage	
	Infrastructure	Non- infrastructure	Infrastructure	Non- infrastructure
Water and sewerage companies				
Anglian	+17.6%	-3.9%	+15.8%	+9.5%
Dŵr Cymru	-2.9%	-0.7%	0.0%	-5.6%
Northumbrian	+10.3%	+8.6%	-3.5%	+4.3%
Severn Trent	+12.6%	-15.4%	+1.1%	-6.2%
South West	-9.2%	+0.5%	-3.3%	-6.6%
Southern	+8.6%	-6.2%	-10.2%	-11.1%
Thames	-6.1%	-3.7%	-5.0%	-2.5%
United Utilities	+13.1%	+4.4%	-8.0%	-7.9%
Wessex	+12.1%	+5.4%	+7.3%	+8.4%
Yorkshire	+8.2%	+7.4%	+12.2%	+13.2%
Water only companies				
Bournemouth & W Hampshire	-12.6%	-6.8%		
Bristol	+0.1%	+0.1%		
Cambridge	-5.7%	-4.0%		
Dee Valley	+2.1%	-2.0%		
Portsmouth	-6.5%	-10.3%		
South East	-13.2%	+1.7%		
South Staffordshire	+0.1%	-1.7%		
Sutton & East Surrey	-0.9%	-5.3%		
Veolia East	-17.4%	-10.0%		
Veolia Central	-13.6%	-6.9%		
Veolia Southeast	+12.5%	-10.6%		

Note:

A positive number means a company is relatively efficient, so we have made a positive adjustment in setting the baseline and vice versa.

5. Financial assumptions for setting price limits



This chapter sets out our approach to the key financial decisions necessary to set price limits. We attach a table showing the aggregate five-year financial information for each company in appendix 3.

5.1 Capital charges

Customers pay for capital expenditure over the lifetime of the assets financed. Bills to customers include:

- a current cost depreciation charge for above-ground assets, such as treatment works; and
- an infrastructure renewals charge (IRC) for underground assets, such as pipes, which form part of either the water or sewerage networks.

Together, we refer to these as ‘capital charges’.

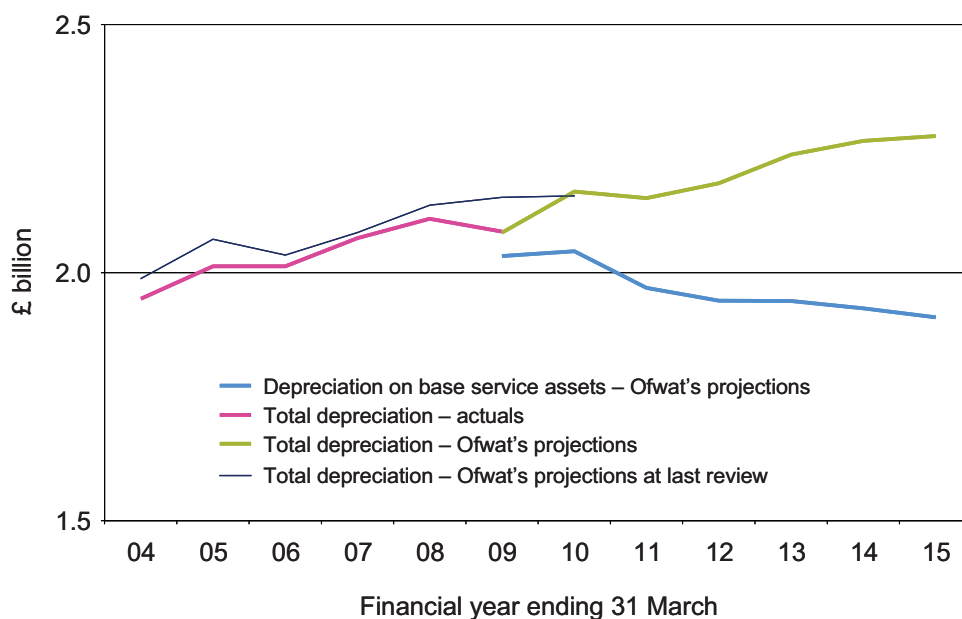
5.1.1 Current cost depreciation

Figure 14 shows the trend in depreciation charges from 2004 to 2015. For the period 2009-15, this shows depreciation on base services separately from total depreciation. It also compares the depreciation we assumed in price limits in 2004 with that charged in the companies’ accounts up to 2009. This shows that, in the period to 2008, companies’ depreciation charges were broadly similar to our assumptions. In 2009, the actual charges reported by the industry (in 2007-08 prices) are lower than that in the previous year.

Total depreciation continues to increase in 2010-15 because of the continued investment required for new enhancements, primarily the quality programme and expenditure to maintain the supply/demand balance, which increases the capital base. We discussed capital expenditure (from which we derive the depreciation charges) in chapter 4.

The small dip in depreciation in 2010-11 reflects the impact of the companies’ asset revaluation carried out at the price review and our adjustments to depreciation arising from our overall check against maintenance expenditure. We discuss these in more detail below.

Figure 14 Current cost depreciation charges 2004-15



Asset values

For this review, we required all companies to carry out a full revaluation of their assets (on a modern equivalent asset (MEA) basis). We expect such a valuation to result in a decrease in current cost depreciation. However, the revaluation has led to an increase in current cost depreciation charges for about half the companies above the levels they are currently reporting in their regulatory accounts.

A number of companies have been unable to explain fully in their business plans what is driving the increase and have attributed it to a more robust methodology adopted for this review. Companies have also attributed the increase to assets that were 'undervalued' at previous reviews or omitted entirely. Companies have not consistently carried out revaluations or made the linkage with the current cost depreciation. Issues included:

- whether companies have properly valued assets on an equivalent asset basis;
- the use of the construction price index to uplift costs within cost models; and
- the assessment of remaining asset lives.

In our draft determinations we allowed half of any increase in current cost depreciation arising from the MEA revaluations. However, we said that we would look more closely at this for our final determinations. Companies who had increases in current cost depreciation because of their asset revaluations provided more information to support and explain this. In our final determinations for seven companies, we have made specific adjustments to current cost depreciation. dependant upon the particular issues we have identified with each company. Other companies were not able to demonstrate that the increase in MEA value was justified. As a result, we have not included in price limits any increase in current cost depreciation arising from the revaluation.

Overall check on depreciation

We carried out our overall check on depreciation by comparing current cost depreciation with non-infrastructure capital maintenance expenditure over the period 1997-98 to 2024-25. This timescale is consistent with our long-term approach to capital maintenance planning. Given that companies have carried out full MEA revaluations, including reassessments of remaining asset lives, we expected them to be able to explain any differences between the current cost depreciation and expenditure. This has not been the case.

After taking into account valid explanations for differences between the two, we made downward adjustments to the current cost depreciation projections for eight companies. These adjustments totalled £265 million for 2010-15, about 2.4% of the total current cost depreciation charge. This is slightly less than the total adjustment we made in draft price limits. The decrease reflects additional information to explain the differences between depreciation and expenditure put forward by companies in their representations.

5.1.2 Infrastructure renewals charge

The amount of IRC charged in companies' regulatory accounts for 2005-09 was about 13% higher than we assumed when we set price limits in 2004. This reflects the significantly higher infrastructure expenditure incurred over that period than we assumed in our price limits.

The IRC that we have included in our final determinations is broadly in line with the amounts that companies have charged in the regulatory accounts since 2005. It is therefore higher than the amount we included at the 2004 price review.

For most companies, we have calculated the IRC using a 15-year average of infrastructure renewals expenditure (IRE) over the period 2005-20. We have accepted the cases that eight companies put forward to calculate the average based entirely on projected expenditure in the period 2010-25.

Five companies asked us to include an increase in IRC, over the ten-year period 2010-20, to recognise the IRE they have incurred since 2005 over and above the assumptions we made when we last set price limits. We have accepted the cases made by four of these five companies.

The IRC we have included in price limits (£4.1 billion) for 2010-15 is slightly lower than the total IRE (net of grants and contributions) we have assumed for that five-year period (£4.7 billion). This is because of differences in the profile of IRE over the 15-year period that we use to calculate the IRC. This may be because of a stepped increase in projected future expenditure levels from that incurred historically or because the expenditure levels in 2010-15 are not necessarily sustained into future periods. Any difference between the IRE and IRC that arises in the short term is financed through a return on the RCV.

5.2 Regulatory capital value (RCV)

At an industry level, the RCV continues to grow over 2010-15. This reflects the continued capital enhancement programme. By 2015, we expect the RCV for the industry to be £53 billion. The projected RCV increases by 11% over the period, slightly less than the 13% growth in the period 2005-10. This results from a change in the mix of capital expenditure for the next five-year period, which reflects more maintenance expenditure and less expenditure to grow or enhance the asset base.

At the level of individual companies, the picture is more varied. Over the period 2010-15, a number of companies continue to see sizeable RCV growth. For others, where the mix in capital investment has shifted to be mainly capital maintenance based, we expect little or no growth in the RCV. For example, the growth in the RCV for Thames from 2010-15 is 29%, reflecting the large enhancement capital programme. Over the same period, Portsmouth's RCV shows a decline of 12%.

Table 43 sets out the expected movement in the RCV for the industry. The position for individual companies is included at appendix 4.

Table 43 Industry regulatory capital value: movement between 2010-11 and 2014-15

£ billion (2007-08 financial year end prices)	2010-11	2011-12	2012-13	2013-14	2014-15
Closing regulatory capital value at 31 March 2010	48.02				
Opening adjustments	0.02				
Regulatory capital value at 1 April	48.04	49.03	50.76	52.22	53.19
New investment	4.20	4.99	4.77	4.32	3.59
Capital maintenance charges	-3.01	-3.05	-3.11	-3.14	-3.15
Adjustment for roll-out of past capital efficiency	-0.21	-0.21	-0.21	-0.21	-0.21
Regulatory capital value at 31 March	49.03	50.76	52.22	53.19	53.42

We have continued to use the same approach to and calculation of the RCV that we have used at previous price reviews.

We have adjusted the closing RCV at 31 March 2010 that we assumed at the 2004 price review (adjusted to take account of the interim determinations we carried out in 2005-10) to give an opening value at 1 April 2010 for this review. These opening adjustments are for:

- logging up, logging down and shortfalls (a net decrease of £556 million);
- the difference between the actual construction price inflation and our estimate from the 2004 review (an increase of £769 million); and
- land sales in the period 2005-10 (a decrease of £192 million).

Table 44 shows the analysis of logging up, logging down and shortfalls by service.

Table 44 Logging up, logging down and shortfalls

2004-05 to 2009-10 £m	Ofwat view of logging up, logging down and shortfalls for capital expenditure		
	Water	Sewerage	Total
Logging up	342.4	282.9	625.3
Logging down	-332.3	-537.2	-869.5
Shortfalls	-42.1	-269.3	-311.4
Net amount subtracted from/added to RCV	-32.0	-523.6	-555.6

Logging up or down of capital expenditure represents additional or reduced outputs that were not anticipated at the last price review, but were not part of an interim determination.

Where a company has not met a required output, we make a shortfall adjustment. We have made shortfall adjustments for nine companies. We adjust the RCV to remove capital expenditure assumed in 2005-10 associated with that output. We also recover the additional return that the company has earned on the capital expenditure in 2005-10. We do so through an adjustment to a company's revenue (rather than through the RCV). The total revenue adjustment for shortfalls for the industry for 2005-10 is £91 million.

The adjusted opening RCV is then rolled forwards taking account of:

- new investment;
- capital charges; and
- past capital efficiencies.

As at previous price reviews, we have smoothed the adjustment for the roll-out of past capital efficiencies over the five years on a net present value basis.

Where companies have financed additional investment out of capital efficiencies, we would not generally remove such investment from the RCV. Where expenditure is more than the assumed level on a service-specific basis, then a company needs to make a well-reasoned case why we should include the expenditure. Eleven companies have invested more than we projected at the last review, totalling £305 million and we have excluded this from the capital value.

5.3 Approach to risk and uncertainty

Providing water and sewerage services represents a low business risk compared with other industries. This is because of the :

- nature of the industry; and
- regulatory framework developed around it.

The price limits and the outputs are a package, which, by its nature, will include some outputs that turn out to be more costly and others that will be less so. For most outputs, we can make reasonably confident central estimates of costs and the other chapters set out how we have done this.

Inevitably, some uncertainty will remain. For example, during the price review period a company may face some changes to its required outputs and the costs it incurs compared to those assumed in the price limits. We have built flexibility into the regulatory framework in the form of a number of mechanisms that help to limit the risk and uncertainty companies face from such changes. In addition, the five-year price review ensures that companies do not carry the remaining risks for more than five years.

In light of our approach to cost estimation and the overall package of risk mitigations, section 5.4 sets out our views on the cost of capital appropriate to the industry. This seeks to remunerate investors for the risk they carry in the water and sewerage sectors relative to other investments. The mechanisms we use to mitigate risk are:

- five-yearly reviews;
- indexation (RPI and notified index);
- interim determinations (including notified items and relevant changes of circumstance)
- the 'substantial effect clause';
- logging up and logging down; and
- the 'change protocol'.

For 2010-15, the symmetrical treatment of capital expenditure under the CIS and the revenue correction mechanism will give companies greater protection than they had in 2005-10.

Our change protocol for 2010-15 is included with our final determinations. It sets out a process for companies to follow should they wish to seek recognition in price limits for material changes to outputs defined too late for inclusion in our final determinations.

The key mechanisms which allow companies (or Ofwat) to adjust price limits between price reviews periods are the interim determination and the substantial effect clause. We discuss these further in the following sections.

5.3.1 Interim determinations

An interim determination allows price limits to be adjusted between periodic reviews. The formal mechanism is set out in each company's licence. It can only be triggered by relevant items, the value of which, in aggregate, exceeds 10% of a company's turnover. Relevant items are classified as either notified items or relevant changes of circumstance (RCCs).

At price reviews, we record notified items for specific items that we have not allowed for (either in full or not at all) in our final determinations. RCCs cover areas such as new or changed legal requirements and the company's failure to deliver an output included in price limits.

Our draft determinations concluded that notified items were required for:

- costs associated with the Traffic Management Act; and
- the impact of climate change on water resources.

In their representations, companies and other stakeholders put forward arguments for additional items the associated costs for which they believed should qualify for inclusion in an interim determination, as either a notified item or RCC.

Having considered the representations, we have concluded that for our final determination notified items are required for:

- increases in household bad debt and debt management costs resulting from worsening economic circumstances in a company's operating area (see section 4.9.3);
- increases in the environmental improvement unit charge component of abstraction charges above the retail price index to cover the compensation costs of the Environment Agency's Restoring Sustainable Abstraction programme (see section 4.9.8);
- increased costs necessary to balance water supply and demand, based on companies' application of UKCP09 data and appropriate analytical tools and processes (see section 4.4.1); and
- costs associated with the impact of the introduction of permit schemes made pursuant to the Traffic Management Act (see section 4.9.7).

We have also concluded that a company-specific notified item is required for Thames. The notified item is for the acquisition of land for the Thames tunnel component of the London Tideway Tunnels (see section 3.2.14).

We also expect costs related to the following issues to qualify as RCCs:

- Competition, where costs arise from changes in companies' legal requirements (see section 4.9.5).
- The adoption of private sewers (see section 4.9.6).
- Work related to implementation of the Water Framework Directive.
- Urban Wastewater Treatment Directive legacy.

Other issues that meet the criteria set out in the companies' licences for RCCs and apply directly to the companies in their capacity as undertakers will be treated as such in any interim determination.

For our final determinations, we concluded that it was not appropriate to allow notified items in some of the areas that the companies wanted. We provide further explanation in section 4.9 but in general, if we have not allowed notified items it is because we:

- have already taken account of the relevant factor in price limits; or
- we have judged the risks to be either covered by indexation or to be part of normal business risk, which is reflected in the cost of capital.

We expect companies to use their management skills to mitigate these risks.

5.3.2 Substantial effect clause

The substantial effect clause is part of the package of regulatory mechanisms that help to reduce the risks that companies face. It allows companies, or Ofwat, to seek revised price limits if a circumstance changes beyond a prudent company's control and if the total adverse or beneficial impact on the company amounts to at least 20% of the company's turnover.

Earlier this year, Sutton & East Surrey asked us to refer our determination of its substantial effect application to the Competition Commission. Our determination, published in December 2008, considered the particular facts relevant to the company's case. It followed a two-stage approach.

- First, we considered whether each circumstance exceeded the materiality threshold of 20% of the company's turnover and would not have been avoided by prudent management action.
- Second, having established that the materiality hurdle was cleared, we assessed whether an adjustment to price limits was necessary. In making this assessment, we considered our duties under section 2(2A) WIA91. In this particular case, we concluded that the company could finance the proper carrying out of its functions until at least the start of the next five-year period on 1 April 2010 when the new price limits come into effect.

Sutton & East Surrey appealed our decision and since our draft determinations, the Competition Commission has published its [final decision](#). As we had done, the Competition Commission also decided that an adjustment to price limits was not necessary. It agreed with our current approach that exceeding the materiality threshold did not itself mean that price limits should be increased. It stated that the materiality threshold was a test of jurisdiction which, once passed, required us to assess whether prices should be adjusted within the framework of our section 2(2A) WIA91 duties.

The Competition Commission also considered whether the impact of multiple circumstances could be aggregated in order to meet the materiality threshold. It decided that aggregating the impact of individual circumstances in this manner may be appropriate. Although this has not been an issue for any of our substantial effect clause

determinations, we had indicated previously that we would not aggregate circumstances in this way.

In future, when determining whether a substantial clause application meets the materiality threshold, we will consider aggregating the impact of individual circumstances. All other aspects of our general approach to the substantial effect clause remain as set out in our [final determination](#) of Sutton & East Surrey's application.

In their representations, some stakeholders commented on the substantial effect clause, its role and the impact of the Competition Commission's final decision on it. Some thought that our draft determinations placed an increased reliance on the clause as a mechanism for dealing with risk. Some considered that, following the Competition Commission's decision, the substantial effect clause's value as a risk mitigant had reduced and had become a test of insolvency of little value to equity investors.

The principles we applied to Sutton & East Surrey's application were consistent with those we set out in our Northumbrian and Bournemouth & West Hampshire substantial effect determinations, which we made in 2003-04. With the exception of the approach to aggregation described above, our approach to the substantial effect clause remains the same as when we made our final determinations of price limits in 2004. We do not consider that our draft or final determinations rely on using the substantial effect clause more than previous determinations. We believe that the balance of risk in the final determination package makes the use of the substantial effect clause no more likely than in previous price review periods.

In assessing Sutton & East Surrey's application, we considered both the level of the return on capital and the level of the financial ratios, not just the financial ratios themselves. We considered whether the ratios were consistent with maintaining investment grade status until we reset prices and the wider context within which the application was made. Considering whether a company's financial ratios are consistent with investment grade is not equivalent to using an insolvency threshold.

A key concern of stakeholders continues to be how we would take account of a prolonged period of deflation, driven by the current financial and economic conditions. In our draft determinations, we explained that the substantial effect clause does not define what a 'circumstance' is (beyond excluding issues that qualify as RCCs). We said that it was clear that the level of RPI is beyond a company's control and that as a result, companies could make an application under the substantial effect clause if they believed the impact of deflation on its costs and revenues was demonstrably at least 20% of turnover and would not have been avoided by prudent management action. As we do in all such cases, we said that we would consider each case on its own merits with reference to the facts relevant to the case.

Some stakeholders interpreted this to mean that we were placing more reliance on the substantial effect clause for the coming five-year period. As explained above, this is not

the case. At draft determinations, we simply sought to provide clarity to stakeholders on a specific issue of concern to them. Section 5.4.1 describes the particular impact of deflation on water companies' financial projections.

Price limits provide some protection for companies against deflation because they include assumptions on trends in wider macroeconomic factors, including inflation. Our final determinations reflect current forecasts and assume a period of deflation in 2009-10 that flows through to customers' bills in 2010-11 followed by a return to positive inflation. This is set out in section 5.11. We have also tested the sensitivity of our price limits to certain factors, including inflation, as set out in section 5.6.

5.4 Financing functions

We have a primary duty to ensure that efficient companies can finance their functions. In section 5.2 of our [methodology paper](#), we set out how we interpret this duty. We said we would set a cost of capital for the industry within the framework of the capital asset pricing model (CAPM), taking account of how we have considered risk in all aspects of the price limit package. We also said that we would ensure price limits provide for efficient companies to be financeable, such that a company's revenues, profits and cash flows are sufficient to allow it to raise finance on reasonable terms.

5.4.1 Context

Since the onset of the credit crunch in August 2007, we have seen a number of failures in the banking system, followed by a period of significant volatility in the financial markets and the onset of recession. While the markets have improved since our draft determinations, significant uncertainty remains over the extent and nature of the recovery.

The perception of risk in the industry relative to other sectors is a key factor in determining companies' ability to raise finance at reasonable rates. Water UK's 2009 investor survey found that investors continue to see the industry as low risk compared with the wider market. However, investors did not consider the industry immune from deteriorating financial and economic conditions more generally. Although it continues to be relatively low risk, recent market conditions highlight the need for the companies to maintain good credit quality to enable capital programmes to be delivered at an efficient cost. In particular, we acknowledge the risk to customers of making too low a cost of capital assumption.

The companies have shown relative robustness to the recent challenging economic and financial difficulties. They have continued to access debt markets, albeit at higher prices than in the period before the start of the credit crunch. We acknowledge that market conditions present difficulties in making forward economic projections and introduce

uncertainty in estimating the components of the cost of capital, although we have seen a reduction of volatility in the equity markets in recent months.

However, as discussed in section 5.3, our approach to regulation includes risk mitigations that limit the effect of this uncertainty and we consider it is important to companies, their investors and consumers that we provide certainty for the five-year price review period. This is a low risk industry with a well understood, tried and tested package of risk mitigating measures that provide additional protection to investors in uncertain times.

We have also considered the potential impact of a prolonged period of deflation in reaching our conclusions on the price setting package. The effect of deflation on the companies depends on a number of factors. The timing of deflation is important because of its differential impact on:

- cash payments;
- cash receipts; and
- the ability of companies to raise debt finance against the value of the RCV.

Deflation affects companies in different ways because of their capital structure. In particular, companies with relatively low proportions of index-linked debt embedded in their balance sheets suffer most in a period of deflation. This is because the cash interest payment will comprise a relatively greater proportion of cash flow from operating activities than in an inflationary period.

The overall impact on a company's ability to finance its functions as a result of deflation critically depends on how long it lasts and the depth of it. The inflation assumptions within our final determinations reflect current forecasts. These include a deflationary assumption for the latter part of 2009, followed by a return to positive inflation. To the extent that the deflationary environment differs materially from the assumptions included in price limits, the substantial effect clause offers protection to companies as set out in section 5.3.2.

5.4.2 Cost of capital

In coming to our judgement on the cost of capital, we have considered the price setting package as a whole. This includes:

- an assessment of the return needed by investors and lenders to compensate for their exposure to systematic risk;
- company-specific risks, which are included in our cost and revenue assumptions; and
- the risk sharing mechanisms within the regulatory regime.

Water and sewerage companies' estimates of the cost of capital in their final business plans fell within a narrow range of 4.7% to 5.0% on a real, post-tax basis, with one company (Thames) above the range at 5.25%. The range for the water only companies was wider at 5.45% to 6.3%, largely because of the different views on the size of the small company premium they consider is required.

Most companies determined their proposed cost of capital from a study by National Economic Research Associates (NERA), that Water UK commissioned. In some cases, the companies supplemented this with their own analysis. NERA's estimate of the post-tax cost of capital in its January 2009 report was in the range 4.6% to 5.1%, based on gearing of 60%. NERA did not update its cost of capital estimate in its August 2009 report despite the significant easing of the financial markets since January 2009. However, it did calculate a revised range for the current cost of equity since the start of the credit crunch and recommend an overall cost of debt at the low end of its previously proposed range at 3.8%.

We settled on a cost of capital of 4.5% for our draft determinations. We considered this to be appropriate assuming a central view of costs and a balanced view of risk. We have considered carefully the representations we received on our draft determinations that focused on the balance of risk. We comment on this further in section 5.6. We have also considered carefully the balance of risk within our final determinations. In light of this, the weighted average post-tax cost of capital for the final determinations remains at 4.5%. This is below the level set at the 2004 price review (5.1%), but is towards the high end of the range supported by our advisers (Europe Economics).

We have set out range estimates from Europe Economics' report and the components of our point estimate in tables 45 and 46 respectively. Although we have stated the component parts of the cost of equity in the tables, we consider it is most relevant to focus on the overall cost of debt and cost of equity.

In reaching our cost of capital assumption, we considered, among other evidence:

- the updated advice of Europe Economics;
- NERA's work (on which most companies appeared to base their proposals);
- market evidence since draft determinations;
- company representations on our draft determinations; and
- we have reviewed an updated consultancy report on the cost of capital that CCWater commissioned.

Table 45 shows a range estimate for the cost of debt of 2.5% to 4.7% compared with NERA's range estimate for the cost of debt of 3.8% to 4.3% (based on a 30:70 split of current and historic debt costs). NERA's proposed cost of equity ranged from 7.4% to 8.2%. The cost of equity was driven by a dividend growth model assessment as this overlapped with the high end of NERA's CAPM assessment.

In its advice, Europe Economics provided a ‘marked up’ range to take account of asymmetric consequences associated with the risk to customers of setting the cost of capital too low. This mark-up was applied to the overall cost of capital, not individual components. We show Europe Economics’ marked-up range (2.9% to 5.4% on a post-tax basis) for the cost of capital in table 45. The width of the range reflects the uncertainty around estimating the cost of capital, particularly in the context of the current markets.

Europe Economics produced its point estimate within its range after further analysis based on a weighted assessment of two separate cost of capital point estimates. It provided a point estimate of 4.3% for a cost of capital based on current market data and a cost of capital representing its best view on where the market may settle as the current constraints in credit markets ease. Europe Economics’ report on the cost of capital for our final determinations and accompanying briefing notes are available on our [website](#).

Table 45 Europe Economics’ range for the cost of capital for the water industry

	Low	High
Gearing (debt: RCV)	55%	65%
Cost of equity		
Risk-free rate	1.5%	2.2%
Equity beta	0.5	0.9
Equity risk premium	4.1%	5.4%
Cost of equity (post-tax)	3.5%	7.2%
Cost of debt		
Cost of debt (gross of tax shield)	2.5%	4.7%
WACC – gross of tax shield (Vanilla)		
	2.9%	5.6%
WACC – post-tax		
	2.5%	4.7%
Marked-up WACC to account for the asymmetry of consequences		
WACC – gross of tax shield (Vanilla)	3.4%	6.4%
WACC – post-tax	2.9%	5.4%

While we have not chosen to distinguish between different market conditions or apply an explicit mark-up, we believe our cost of capital set out in table 46 is supported by the range of evidence and analysis set out in the Europe Economics report. It will enable efficient companies to maintain access to the capital markets throughout 2010-15 and beyond. But as stated above, we consider it most relevant to consider the overall cost of debt and the overall cost of equity rather than to focus on individual components.

Table 46 The weighted average cost of capital for the water industry

Gearing (debt: RCV)	57.5%
Cost of equity	
Risk-free rate	2.0%
Equity beta	0.9
Equity risk premium	5.4%
Cost of equity (post-tax)	7.1%
Cost of debt	
Cost of debt (gross of tax shield)	3.6%
WACC – gross of tax shield (Vanilla)	
	5.1%
WACC – post-tax	
	4.5%

5.4.3 Cost of equity

The weighted average cost of capital includes a 7.1% post-tax cost of equity derived from measurements of the risk-free rate, equity risk premium and asset beta estimates. Our final determination cost of equity is at the high end of the Europe Economics pre-marked-up range (3.5% to 7.2%), but we believe that it is necessary to allow the industry to maintain access to finance in difficult economic times. This takes into account general expectations that current economic conditions will continue in the early part of 2010-15 and the need to ensure the cost of equity is sufficient to both keep equity in the sector and attract new equity.

We have presented our assessment of the cost of equity in the context of CAPM. The assumptions that underpin the assessment are:

- **A risk-free rate of 2.0%.** This is below the 2.8% we assumed at the last price review. It is well above the current spot rates for index-linked gilts but consistent with the view that the risk-free rate is expected to increase in the medium term. It is also consistent with the ten-year long-run historic UK index-linked gilts of five- and ten-year maturity and consistent with recent regulatory determinations.
- **An equity beta of 0.9.** Our equity beta of 0.9 at the 57.5% notional level of gearing derives from an asset beta of 0.4. These assumptions are at the high end of Europe Economics' beta observations, but reflect the fact that we are setting price limits at a time of market uncertainty. This is lower than the equity beta of 1.0 implied in our 2004 determinations.
- **An equity risk premium of 5.4%.** This is above the figure we used in 2004 and is at the high end of the pre-marked-up range proposed by Europe Economics (itself based on Dimson Marsh and Staunton series data for the long-term equity risk premium). It reflects our view that we should assume a high equity risk premium given the economic conditions within which the cost of capital is set and

is at the top of the historical range. Recent analysis suggests an expectation that the future long-run risk premium will be less than the historical average.²

In their representations to our draft determinations, most companies raised concerns with the cost of equity. Companies that commented on the cost of equity were concerned that the market reaction to our draft determinations suggested the cost of equity was too low. They suggested that the post-tax cost of equity:

- was lower than could be supported by long-run historical evidence; and
- did not reflect the impact of the recession on required equity returns to compensate for increased market risk.

Some companies, based on arguments put forward by NERA, considered that the risk-free rate was downwardly biased as it was calculated using index-linked gilts rather than swaps.

We have considered the arguments put forward by the companies and NERA. But we note that the cost of equity is towards the high end of the pre-marked-up range proposed by Europe Economics. In their response to NERA's critique of our draft determinations, Europe Economics set out persuasive arguments that support our general approach to calculating the risk free rate using index-linked gilts.

In our [methodology paper](#), we were clear that we would set the cost of capital using the CAPM framework, but that we would cross check using other models, including the dividend growth model (DGM).

We noted in our draft determinations that NERA's longer-term range of 7.4% to 8.2% for the cost of equity does not factor in historic evidence and relies more heavily on analysts' forward projections. NERA provided an updated estimate of its DGM derived cost of equity in its August 2009 report of 7.9% to 10.6%. This was calculated using current data, since the start of the credit crisis. NERA considered this to be of particular importance for companies that need new equity to finance their capital investment programme.

Europe Economics' DGM range for the cost of equity was 5.6% to 7.7% based on actual levels of gearing. We have published on our website the additional DGM analysis Europe Economics prepared in response to NERA's review of our draft determination financial assumptions. Europe Economics' analysis provides a range of outcomes, all of which encompass our cost of equity.

A key difficulty with the DGM is the need to make an estimate of the future dividends expected by investors. Europe Economics' view was that we should be particularly cautious about placing weight on DGM estimates calculated during a period of financial

² See Dimson, Marsh and Staunton 2009. Credit Suisse Global Investment Yearbook 2009.

turmoil because analysts' forecasts of the absolute amount of future dividends are likely to be biased upwards when share prices are falling. In addition, Europe Economics advised that DGM projections which relied on proxies for analysts' forecasts may not accurately reflect investors' expectations of long-run dividend growth for a particular company. Therefore, we have not placed particular weight on a DGM-derived cost of equity in our final determinations.

We assume the same cost of equity for those companies where we have assumed an equity injection. This is because the new equity is to support RCV growth for companies operating under a stable regulatory regime. This is consistent with the view expressed by [Smithers](#) (2006) that where equity issuance assumed by the regulator is to maintain gearing, the informational problem which may otherwise require increased equity returns, largely disappears.

The updated work for CCWater gave a range for the cost of equity of 4.5% to 5.0%. The consultants take a different view on the risk-free rate, which is based on a more current assessment than the longer-run averages we have assumed. The consultants also use a lower equity risk premium of 3.9% to 5.0% than has been assumed in any of the other evidence presented to us.

5.4.4 Cost of debt

Consistent with our draft determinations we have assumed a real cost of debt of 3.6%. In doing so, we have drawn on direct observations from companies' existing debt portfolios and forward projections. The cost we have assumed for existing debt is 3.4%. Our forward-looking cost of debt is 4.1% to 4.3%. We have factored into this assessment the mix of existing debt that will remain in place over 2010-15, together with the new financing and refinancing requirement. At an industry level, we have assumed that the ratio of existing debt to new debt is 75:25.

Companies did not raise significant concerns with the cost of debt in their representations. Where companies did comment, they made comments consistent with NERA's work that there are likely to be upward pressures on the cost of debt in the short and medium term as a result of the economic outlook, likely volume of gilt issuance and the unwinding of quantitative easing.

In the bond markets, 2009 has seen very significant bond issuance in the UK and European markets. Bond spreads have tightened significantly since January 2009 and spreads appear to have levelled off since August. Our forward-looking cost of debt of 4.1% to 4.3% factors in that market conditions remain uncertain and a cautious view that conditions in the markets could continue to be difficult during 2010-15. It is lower than the more cautious forward-looking cost of debt that NERA propose.

Europe Economics' advice on the cost of debt focused on the cost of new and refinanced debt. This is not directly comparable to the cost of debt we set, as we have calculated it differently.

In concluding on the cost of debt, we have also drawn on the evidence from the markets regarding the apparent limited appetite for index-linked debt. Although there has been some evidence that companies are continuing to access limited amounts of index-linked debt, we have continued to assume no new issuance of index-linked debt. However, we expect that the companies will continue to be able to access EIB debt as a relatively competitive source of debt finance.

Our forward-looking cost of debt ensures that efficiently financed companies, with efficient treasury management, are able to maintain a balanced portfolio of debt, including access to debt at a range of maturities to meet their financing requirements.

We have set the cost of debt at a level that allows companies to meet transaction costs, commitment fees and costs associated with the maintenance of an appropriate level of liquidity. We calculate these costs to be 0.2% on the cost of debt overall, factoring in a view of these costs under current and more benign economic conditions.

The work commissioned by CCWater gave a range for the cost of debt of 2.2% to 2.7%. Its advisers take a different view on the risk-free rate. This is based on a more current assessment of the risk-free rate than the longer-run averages we have assumed.

5.4.5 Gearing

In setting the cost of capital, we have assumed a level of gearing that is appropriate for the industry. We consider that the range 55% to 65% continues to be a sustainable level of gearing to ensure companies remain comfortably within the investment grade category.

In setting price limits, we have adjusted the companies' opening balance to 57.5% gearing. We consider this is the appropriate level as:

- it is broadly consistent with the closing notional level of gearing for the industry we assumed at the last price review, which assumed retention of cash flows to address financeability constraints, and does not therefore imply an equity injection to the opening balance sheet; and
- our gearing assumption accounts for the opposing effects of deflation and financing efficiencies achieved by companies in 2005-10. Deflation can act to decrease the value of the RCV and therefore increase gearing because of the effect of nominal debt. On the other hand, it is reasonable for customers to assume that a company has retained some of the financing efficiencies achieved through lower cost debt achieved in the market conditions that prevailed in the period 2005 to 2007.

5.5 Small companies

All of the water only companies argued for a small company premium. Their views were based largely on work that NERA carried out, which the water only companies submitted with their business plans and updated in response to our draft determinations.

Arguments in favour of the small company premium focused on three main ideas.

- Small companies have access to less competitive and more limited sources of finance and are therefore more exposed to risks associated with the cost of debt finance.
- The need to compensate the cost of equity for the illiquidity of trading shares in smaller companies.
- Small companies face greater systematic, financial and asymmetric risks that increase the cost of equity.

The smaller companies and NERA also argued that water only companies needed to exhibit healthier financial ratios in our financeability assessment as they are more exposed to asymmetric risks, for example:

- cost overruns on single projects;
- higher revenue concentration risks; and
- greater exposure to event risks.

In its response to our draft determinations, NERA repeated many of these arguments in its report on the small companies.

There is evidence that small companies face different challenges to larger water companies in accessing debt. Therefore, there is a need for a small company cost of debt premium. Access to debt finance is more limited for water only companies. We observe that only the two largest water only companies have been able to issue conventional bonds directly into the market.

EIB debt is currently not available for direct issuance to water only companies (but only because of constraints on minimum levels of lending). Market difficulties may mean that finance from innovative arrangements such as Artesian finance, which has involved monoline insurers, is not currently available and is unlikely to be available in the near future. In addition, NERA's analysis suggested that water only companies rely more heavily on bank debt that has a cost disadvantage compared with conventional bond market debt.

Our determinations include a small company cost of debt premium of 0.1% for the two largest water only companies and 0.4% for all of the other water-only companies. The

assumptions are at the low end of the range presented by NERA. The assumption for the largest two water only companies factors in a view that these companies will be able to continue to access conventional bonds in the future.

In response to our draft determinations, NERA argued that at the lower end of its proposed range assumed future issuance of Artesian finance which, as noted above, may not be available. While Artesian finance may not be currently available, that does not mean alternative financing arrangements may not arise for small companies in the future.

We found the arguments put forward for a small company cost of equity premium in respect of illiquidity in trading costs to be less robust or clear. We consider it is more relevant to consider the cost of equity for the small companies in respect of their exposure to systematic risks as this is consistent with the CAPM approach.

NERA's advice to the water only companies, for its representation on our draft determinations, supported a higher cost of equity premium based on the premise that water only companies face higher relative systematic (beta) and cash flow (financial and asymmetric) risks than water and sewerage companies. This resulted in a significant increase in the overall small company premium proposed in the final business plans when compared with the evidence presented:

- for the draft business plans. and
- when the small company premium was set at the 2004 price review.

Systematic risks are relevant to the cost of equity. These risks include:

- input price risk;
- the impact of operational leverage; and
- demand and revenue risks.

In particular, NERA argued that revenue shocks, including revenue shortfalls and the impact of bad debt, have a greater impact on water only companies because profits are a smaller proportion of the cost structure of these companies.

The revenue correction mechanism introduced for this review removes any risk associated with household demand, limiting any difference in systematic risk to demand from large users. For most water only companies, the proportion of revenue from large users is comparable to the range for the water and sewerage companies.

While concentration of revenue risk to individual customers may be greatest for water only companies, we consider this a company-specific risk. In the event of the loss of a large customer to a water company, then we would need to consider the impact of this in relation to our duty to enable efficient companies to finance their functions, and the

package of the risk mitigation measures available to the regulatory framework, which we discuss in section 5.3.

NERA suggests that increases in bad debt associated with a downturn in the business cycle will affect water only companies more than water and sewerage companies because of their cost structure. This evidence does not convince us. Our historic assessment of bad debt suggests water only companies have been in a position that is no worse than the water and sewerage companies. While we have not made an assumption of higher future operating expenditure for bad debt for any company, we have considered bad debt on a company-specific basis when assessing relative efficiency and, for our final determinations, we have introduced a notified item for bad debt for all companies.

Europe Economics advise us that the analytical basis for a difference in systematic risk between water only and water and sewerage companies is not sufficiently strong for us to justify a difference in systematic risk between categories of companies. We do not consider the evidence presented is sufficient for us to conclude a different approach is required for systematic risk in respect of the water only companies.

Company-specific risks are those that can be diversified by investors. As a result, they are not captured by the beta factor (and hence the cost of equity). The main credit rating agencies present a consistent view that smaller companies are higher risk because of their exposure to specific risks, which includes:

- higher asset concentration;
- higher revenue concentration; and
- exposure to event risks.

These are not risks that impact on the CAPM-derived cost of capital as such. This is because the CAPM model assumes that investors diversifying their investments can offset specific risks affecting an individual firm. However, these are risks that have potential consequences on the cash flows of the water only companies should these risks occur. Therefore, the rating agencies require more headroom in cash flows for water only companies to take account of these risks. We have recognised the overall impact of specific risk on the water only companies in our gearing assumption and in the financeability assessment that we describe below.

5.5.1 Gearing assumption for small companies

Traditional corporate finance theory suggests that if a particular company is exposed to relatively greater risks (whether systematic, financial, specific or in combination), then it is appropriate to adopt a more conservative gearing structure to provide headroom to manage these risks. We have considered the arguments of small companies about specific risks, but we do not consider these clear cut. However, on balance, and given the rating agencies' approach, we consider that because the small companies may have

higher exposure to specific risks, it is appropriate to assume a 5% differential in gearing between water only companies and the water and sewerage companies.

Therefore, we have adjusted the opening gearing for the water only companies by 5% from our general gearing assumption of 57.5% (that is, 52.5%). This is consistent with the differential in the average level of gearing between water only companies and water and sewerage companies observed for their actual financial structures.

In their representations, some of the companies, based on an argument put forward by NERA, suggested that for a given level of leverage, water only companies should be able to demonstrate superior coverages in their financial ratios than water and sewerage companies in order to achieve the same credit rating. In practice, some water companies, particularly the highly geared ones, have achieved 'superior coverages' through issuing significant proportions of index-linked debt. This does not translate to a need for a different treatment for the water only companies in price setting.

We have not assumed a different proportion of index-linked debt in our capital structure between water only and the water and sewerage companies.

The overall cost of capital for water only companies is set out in table 47. We have maintained the cost of equity that we have used at the industry level in our cost of capital calculation to improve the cash flows of the water only companies. This cost of equity is higher than it might otherwise be under a CAPM approach at 52.5% gearing, as we have not adjusted the equity beta for the water only companies.

Table 47 The weighted average cost of capital for small companies

Companies	Weighted average cost of capital		Equity	Debt	
	Gross of tax shield (Vanilla)	Post-tax	Post-tax	Pre-tax	Post-tax
	South East Water, Veolia Central	5.3%	4.8%	7.1%	3.7%
All other water only companies	5.5%	4.9%	7.1%	4.0%	2.9%

5.6 Financeability

We have described a company, if reasonably efficient, as financeable if its revenues, profits and cash flows allow it to raise finance on reasonable terms in the capital markets. We have assessed financeability by calculating a wide range of financial ratios used by the rating agencies and the wider financial community.

We have discussed the approach to assessing credit ratings with each of the main rating agencies. As for previous price reviews, there is no single set of ratios that captures the approach of the rating agencies. The agencies emphasise that their ratings are based on a broad assessment of each company individually, not just quantitative ratios.

Table 48 sets out the five key ratios against which we have considered the price limit package. We have also considered dividend cover as a key ratio for equity investors, but we have not set a specific target level as it is for the companies to determine their own dividend policies. We also considered accounting interest cover ratios on an historic and current cost basis. Our discussions with the credit rating agencies informed this approach.

Table 48 Key financial indicators

Ratio	WaSCs	WoCs
Cash interest cover (funds from operations: gross interest)	About 3 times	About 3.5 times
Adjusted cash interest cover (funds from operations less capital charges: net interest)	About 1.6 times	About 1.8 times
Funds from operations:debt	About 13%	About 17%
Retained cash flow:debt	About 8%	About 10%
Gearing (net debt: regulatory capital value)	Below 65%	Below 60%

It is important for customers that investors and markets continue to see that the companies maintain a good quality credit rating, especially given the need for the industry to finance a significant investment programme and to refinance existing debt. This is particularly the case where the financial markets are more volatile. Water companies and other utilities have taken advantage of issuance windows as they have arisen to finance liquidity. As a result, most water companies are currently able to demonstrate they are pre-financed into the early part of the 2010-15 period, but given the size of the investment programmes, it is important that these companies are able to continue to access finance on reasonable terms.

In their responses to our draft determinations, investors and the companies raised particular concerns that the overall package put greater risk on companies and their equity investors leaving little scope to achieve or outperform the cost of capital. We comment on the risk sharing mechanisms as a whole in section 5.3.

For our final determinations, we have looked again at our assumptions on costs and revenues in light of the representations. This has resulted in:

- upward revisions to costs allowed in price limits where outputs have not changed;
- downward movement in the CIS ratios
- revised revenue assumptions; and

- the introduction of notified items for bad debt and certain elements of abstraction charges.

These changes to cash flows have reduced risk for companies and their shareholders compared with our draft determinations. We discuss the items that have changed in chapter 4. Some stakeholders also identified the CIS mechanism as a particular issue that increased risk to the industry. We think these concerns are unfounded. In considering the CIS mechanism, companies and other commentators have assumed no outperformance of the determination capital expenditure assumptions. We explain in appendix 5 why it is important to consider the scope for capital expenditure outperformance. We also provide an illustration that compares the return on equity using a combination of realistic ex-ante and outturn assumptions under the PR09 CIS approach and the PR04 frontier approach to determining capital expenditure.

As in previous price reviews, we have carried out a financeability assessment to ensure financial projections were comfortably within the investment grade range. We carry out the financeability assessment before adjusting for incentive mechanisms such as:

- the OPA;
- CIS additional income;
- shortfalling adjustments; and
- operating expenditure and capital expenditure outperformance.

This is so that the incentives brought about by these mechanisms are preserved. In their representations, some companies said that we should carry out the financeability assessment after these adjustments if we were to meet our duty to secure that the companies are able to finance their functions. Table 49 shows the aggregate adjustments included in our final determinations for each of these incentives.

Table 49 OPA and revenue adjustments

(£m)	2010-15
OPA adjustment	-75
CIS – additional income	-136
Shortfalls	-91
Operating expenditure outperformance	77
Capital expenditure outperformance	48
Total	-178

The current financial environment means we need to be more explicit with the level of the package of financial ratios. For our final determinations, at the point at which we consider financeability, we have targeted financial ratios under our notional structure that are consistent with an A-/A3 credit rating. Most companies are in this position.

If one particular indicator (and in a small minority of cases, two key indicators for one rating agency) does not meet our required threshold, we ensure that it meets the criteria for a strong BBB+/Baa1 credit rating as a minimum. Our approach is consistent with a view expressed to us that the capacity of investors to invest appears to be less sensitive to the difference between high BBB and low A range ratings where utilities are concerned. Our approach is consistent also with our cost of debt where we have set a range for the forward-looking cost of debt.

We have also tested our final determinations package against some realistic downside scenarios to ensure that our cost of capital and the risk mitigation measures represent a balanced approach to risk given the uncertainties.

We recognised in section 5.5 that the credit rating agencies require greater headroom in cash flows for water only companies to account for the impact on cash flows of specific or asymmetric risks. Therefore, we have increased the thresholds for the water only companies.

The credit rating agencies make a number of adjustments to company data in their assessment of the financial ratios. In response to our draft determinations, some stakeholders considered we should also make these adjustments in calculating our financial ratios.

For our final determinations, we have revised the cash interest cover ratio to be on a gross rather than a net basis. This ensures consistency with the calculations made by the credit rating agencies. We have been clear that we model assuming a capital structure based on our gearing assumption; accordingly, it is inappropriate that we should make specific adjustments associated with companies' actual financial structures. Neither do we adjust for pension deficits. Although the credit rating agencies make pragmatic adjustments for pension deficits at a point in time, deficits can be volatile, and the companies can manage pension deficits to some extent. However, the financial ratios we calculate fully reflect the cash contribution of deficit funding assumed in price limits.

5.6.1 Assumptions on interest costs in modelling financial projections

We have modelled interest costs that are consistent with our real cost of debt assumption in the cost of capital.

For fixed and floating rate debt, we have assumed interest is paid on a nominal basis, so the annual interest receipts compensate investors for inflation. Annual measures of RPI may be volatile, as is currently the case for forward projections. We have therefore assumed the nominal interest rate includes a longer-term view of inflation. We have modelled an interest rate of 6.2% (that is, 3.6% real and our assumption of investors' long-term view of inflation of 2.5%).

Index-linked debt has a beneficial impact on the financial position of the companies because it has an interest cost that reflects a real rather than a nominal rate of interest. The indexation of the principal to RPI compensates investors for inflation.

Consistent with the approach stated in our [methodology paper](#), we have assumed that 30% of gross debt in the opening balance sheets is index-linked debt. This is broadly consistent with the proportion of total debt held by companies from the direct issuance of index-linked debt. This is the case irrespective of whether the company has a conventional or highly geared structure. While some companies have a greater proportion of index-linked liabilities, they have accessed these by the use of swaps, which is a feature of the highly geared companies.

Although there has been some issuance of index-linked debt since our draft determinations, evidence of market appetite for the issuance of new index-linked debt remains limited. While companies may be able to acquire index-linked debt either by direct or indirect means as market conditions improve, we have not assumed any future issuance in the early part of 2010-15.

Although one of the rating agencies has adopted a policy of excluding the benefit from index-linked debt in its quantitative ratio assessment, we understand it has factored in the benefit of index-linked debt to its qualitative assessment. This specifically affects the 'funds from operations' FFO:debt ratio. We do not make this adjustment and the threshold for the ratio is consistent with this. We have continued to assume the cash interest cover ratios should be set to allow companies to pay cash interest liabilities. Despite this, we have checked the ratio in our financeability assessment using the credit rating agency definition against the levels for the cash interest cover ratio stated in table 42.

5.6.2 Equity investment

In our [methodology paper](#), we highlighted that equity injections, including the issuance of new equity and retained earnings are viable options to ease a financing constraint.

We do not regulate dividends as part of our regulatory framework. It is for management and investors to decide a company's dividend policy. Nevertheless, we need to make some assumptions about dividends for the purposes of modelling cash flows.

We have used a dividend yield of 5% (about 70% of the cost of equity). This implies dividend growth of 2.1% given the cost of equity. The dividend yield is consistent with the view of the industry as an income stock. The dividend yield is lower than for the 2004 price review as we consider equity retention to be an important part of the way forward necessary to ease a financing constraint. The growth assumption for the period 2010-15 is broadly consistent with the GDP growth calculated from the average of independent forecasts of GDP (published by HM Treasury) for the period until the end of 2013 and the Government's forecasts of long-term growth beyond then.

We remain of the view that equity injections or rights issues are legitimate means of easing the financing constraint brought about by continuing large capital programmes. This is particularly the case where new equity supports RCV growth for a company operating under a stable regulatory regime. Three companies (Thames, Bristol and South East) had weaker financial ratios in our financeability assessment at our cost of capital. These companies have the largest RCV growth assumption in 2010-15 and as a result, weaker financial ratios arise. Accordingly, in our financial modelling for Thames, Bristol and South East we have assumed equity injections amounting to 20%, 10% and 7.5% of opening notional equity respectively to relieve the financing constraint.

For these three companies, we also included an allowance to recognise the transaction costs associated with the cost of new equity issuance, calculated as 5% of equity raised. NERA, in its advice to Water UK, suggests transaction costs associated with equity issuance are estimated to be about 5%. This is consistent with evidence elsewhere, including for example, [Smithers'](#) report for Ofgem.

Ultimately, it is for the companies and their investors to determine how best to finance the investment programme in reaction to the overall price limit package. It is possible that the debt markets could recover such that companies will be able to issue index-linked debt either directly or through swap arrangements. This would be an alternative means of easing the financing constraint. If these companies are able to issue more index-linked debt, consumers will not be disadvantaged. This is because we will recover the costs we have assumed for the issuance of new equity at the next price review in the event that the company does not issue equity in the period 2010-15 to finance the investment programme,

The dividend yield we have assumed for the issuance of new equity is consistent with that on existing equity. This is consistent with the view that the purpose of the new equity is to fund growth of the RCV.

5.7 Taxation

Profits need to be sufficient to remunerate investors and lenders, but they also need to cover business taxes. The financial projections show effective current tax rates of about 16% for the industry. This reflects the relatively high gearing of the industry as a whole and its capital intensive nature. For most companies, the impact of tax payments on customers' bills is lower over the period 2010-15 than in 2005-10. This is primarily because of a reduction in the allowed rate of return and hence our projections of operating profit and a lower corporation tax rate (28%) than at the last price review.

We set out our approach to calculating tax in respect of the tax shield on interest payments in our [methodology paper](#). In summary, for companies with actual gearing above the level underpinning the cost of capital, we have calculated tax based on the companies' actual gearing projections in their business plans. For companies whose business plan gearing projections are below 57.5%, we have calculated their tax calculated on the basis that they had geared up to 57.5%.

Companies with relatively low levels of gearing raised concerns that our policy would disadvantage them as it would prevent them from recovering sufficient revenue to finance their functions in circumstances where the company is not able to match the assumed gearing level.

We interpret our duty to ensure companies can finance their functions to mean that price limits will allow an efficiently financed company to deliver its services to consumers and earn a return on capital, on average, at least equivalent to the cost of capital.

Our policy on the approach to tax brings it into line with our assumption on gearing. It is just one policy within the price setting package. It is for the companies, their shareholders and management to determine the most efficient financing structure to meet their circumstances within the price setting package. In addition, our approach to tax is consistent with other regulators, for example the approach adopted by Ofgem for its 2004 and 2009 electricity distribution reviews.

We have tempered the impact through our assumption of lower notional gearing for the small companies. In reality, this has affected just one water only company for our final determinations.

5.7.1 Tax and uncertainty

In their representations, companies continued to raise two specific areas of uncertainty about taxation.

Impact of future changes in accounting standards

About half the companies have asked us to retain a notified item for changes in the timing of tax deductions because of future changes in accounting standards. The change will arise when UK accounting requirements are amended to align with international accounting standards. Most of the companies who have raised this issue are concerned about the impact of changes in accounting for infrastructure assets.

Since we published our draft determinations, the Accounting Standards Board has published more information about the likely timing of this change for consultation. Although the proposed date for changes is now 2012 (that is, it would first occur for water companies in 2012-13 accounts), this is not yet final. Two companies have adopted international accounting standards since we last set price limits. Neither company has asked us to carry out an interim determination because of this change.

We have not made any assumption in our final determinations for this change. Nor have we included a notified item. Although it is possible that additional tax may arise because of changes to accounting standards, this will be heavily influenced by each company's choice of accounting policies. Companies can therefore take steps to manage the tax implications of such a change. In addition, the tax impact of the accounting changes may not be wholly adverse. Expenditure for which companies do not currently receive any tax relief may attract a deduction for tax purposes under the new accounting rules.

In their representations, three companies argued that they had limited scope to manage any impact of this change because their accounting policies are set at group level. We set price limits for companies on a stand-alone basis and we do not take into account the wider group position. We do not agree that it is appropriate that customers should bear additional costs that arise because of accounting policies set by the wider group.

Wider reform of corporation tax

A number of companies have highlighted the impact of any wider reform of corporation tax as an issue in their plans and representations. They have particular concerns about the impact on the sector of the abolition of capital allowances. We have considered this issue and it is not clear to us whether any changes are likely or how they might take effect within this price review period. Furthermore, such changes affect all sectors. We consider this is part of normal business risk and we have not made any allowance for this in our final price limits or included it as a notified item.

5.8 Financial projections underpinning final determinations

We have a duty to enable efficient and well managed companies to finance the proper carrying out of their functions. We have considered carefully the impact that the projected profile of prices will have on the returns, profits and cash flows achieved by the companies.

Table 50 sets out a summary projected profit and loss account for the industry. It also compares the expected position for 2009-10 with the position we assumed when we set price limits in 2004.

The operating profit projection in 2010-11 reflects the change in the level of return. The relatively high level of return in 2009-10 reflects the revenue allowed for financeability at the last price review, as well as the higher cost of capital set in 2004. Thereafter, the operating profit projections remain broadly flat. This is because the additional income the industry needs to finance its growing capital base is offset by other adjustments to revenue. These include adjustments from the CIS mechanism and to recover financing costs for shortfalls.

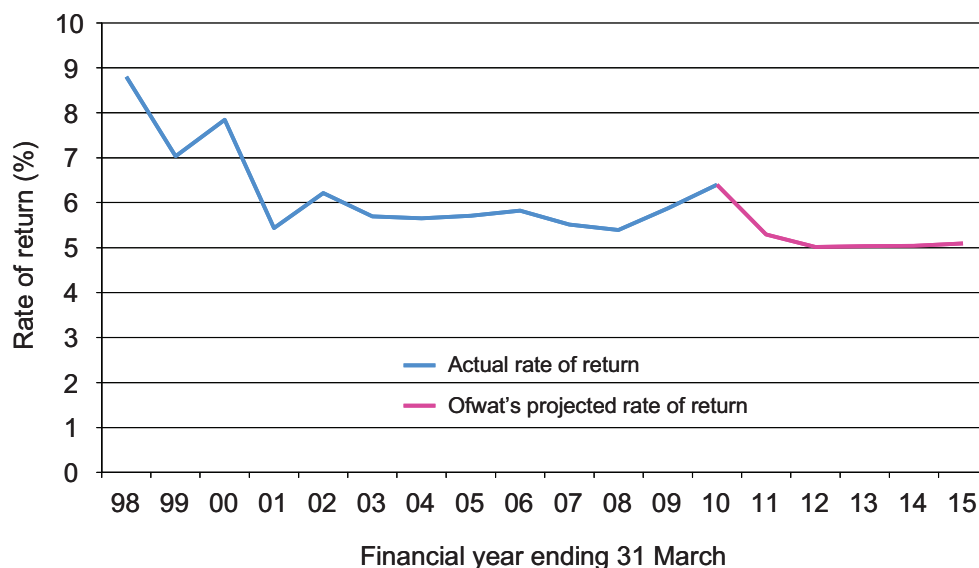
Table 50 Financial projections 2009-10 to 2014-15

Current cost profit and loss account (£ billion)	2009-10		2010-11	2014-15
	2004 review	Actual expected		
Turnover	9.792	9.895	9.502	9.677
Operating expenditure	3.471	3.495	3.699	3.683
Current cost depreciation:	2.110	2.163	2.150	2.275
Infrastructure renewals charge	0.669	0.750	0.810	0.820
Current cost operating profit	3.542	3.507	2.861	2.928
Regulatory capital value (year average)	46.985	47.053	47.731	52.424
Return on capital (post-tax)	5.7%	5.8%	4.5%	4.5%

5.9 Return on capital

Figure 15 sets out the trend in the return on capital from privatisation to 2014-15.

Figure 15 Post-tax rates of return (vanilla basis) 1997-98 to 2014-15



The price limits in 1999 incorporated an immediate step change in returns down to the cost of capital set at that time. After the 2004 price review we expected returns over the period 2005-10 to rise steadily from 5.8% to 6.4% (on a 'vanilla' basis) largely because of higher price limits in 2008-10 to allow for 'financeability'. Actual returns have generally lagged slightly behind our expectation because of lower than expected revenues and higher infrastructure renewals charges. However, for the early part of 2005-10 the costs of finance, particularly the costs of debt, were much lower than we assumed. Despite lower apparent profits, companies have benefited from lower costs of finance and hence higher rates of return to equity. For the period 2010-15, returns are lower than those over 2005-10 reflecting the change in the cost of capital.

5.10 Notified index

We intended to adopt the infrastructure output price index (IOPI) as the index of national construction costs at this price review. IOPI is one of the six composite sub-indices that make up the construction output price index (COPI). New evidence about IOPI has shown that it is not reflective of capital price inflation in the water sector. Consequently, we have decided to retain COPI as the reference index for assessing capital price inflation beyond 2010.

5.11 Inflation

The weak economic environment has made the outlook for inflation (as measured by RPI) uncertain. The RPI index has declined in recent months that is a deflationary position. This makes our projections of RPI more critical than usual.

Our view on inflation follows the trend projections of HM Treasury and most independent forecasters. The trend sees negative inflation in 2009-10 followed by a return to a positive and increasing rate of inflation. We do not see a return to the long-term trend until the latter part of the period. Water and sewerage bills are set in relation to the November RPI. We estimate that this will be negative for November 2009, which sets inflation for 2010-11 bills. The values adopted in our modelling are set out in table 44.

Table 51 RPI inflation

	Financial year average	Year end (March)	Basket year (prior November)
2008-09 (actual)	2.97%	-0.4%	4.28%
2009-10	-0.8%	0.5%	3.00% (actual)
2010-11	2.0%	3.0%	-1.0%
2011-12	3.0%	3.0%	2.0%
2012-13	2.7%	2.7%	3.0%
2013-14	2.5%	2.5%	2.7%
2014-15	2.5%	2.5%	2.5%

On the basis of the published 'all new construction output price index' (COPI) values and our view of RPI inflation, the relative capital cost inflation adopted in our financial modelling is:

- 0% for 2009-10;
- turning positive at 0.5% in 2010-11;
- peaking at 1.5% above RPI in 2011-12; before
- returning to long-term trend of 0.5% above RPI in 2013-14.

6. Revenue



We have checked that companies' revenue forecasts are internally consistent and error-free, and that they reflect both recent historical experience and the best available information about the impact on water demand of prospects for the economy. A number of companies included revised demand forecasts in their representations. We have taken account of this new information where companies have both clearly demonstrated why revisions are necessary and explained the corresponding impact on expenditure forecasts.

We consider that companies' forecasts are broadly reasonable, so the adjustments that we have made are modest. At an industry level, our adjustments amount to less than 0.1% of turnover. We have set out our assumptions in table 52 below.

Table 52 Industry base revenues

	Water service (£m)		Sewerage service (£m)	
	2009-10	Annual % change to 2014-15	2009-10	Annual % change to 2014-15
Household revenues	3,343	0.16	3,620	0.10
Non-household revenues	910	-1.38	940	-0.75
Total tariff basket revenues	4,253	-0.16	4,560	-0.07
Non-tariff basket revenues	360	-1.31	234	-1.80
Total revenues	4,612	-0.25	4,794	-0.15

Using the revenue correction mechanism that we described in our methodology paper, we will make an adjustment at the next price review to take account of each company's revenue outperformance or underperformance relative to the assumptions we will make in our final determinations for 2010-11 to 2014-15. We have confirmed the details of our revenue correction mechanism in [PR09/31, 'Revenue correction mechanism'](#) (July 2009).

Appendix 1: Representations on draft determinations

We received written representations from the following (in addition to all the regulated companies and their reporters).

Customers

- CCWater.
- CADIA.
- Paul Cairney.
- Ursula Cowell.
- E A Guinan.
- Richard Osborne.
- Eric Payne.
- Roland C Rench.
- Sandra Woodman.
- 450 residents of Alcester, Worcs.

Company-related bodies

- Councillor Philip Booth (on behalf of the Wessex Water Joint Customer Liaison Panel).
- Stacey Roe (on behalf of Hartlepool Water's Expert Opinion Panel).
- Anglian Water's independent advisory panels.
- The trustees of United Utilities pension fund.
- Water UK.

Industry suppliers and trade bodies

- Hydroco Ltd.
- Society of British Water and Waste water industries (SBWWI).

Unions

- Unison.

Investors

- AXA Investment Managers UK Limited.

- Canada Life.
- Fidelity International.
- Henderson Global Investors Limited.
- HSBC Plc.
- Invesco Perpetual.
- M&G Limited.
- Newton Investment Management Limited.
- RBS Plc.
- TIP (Guernsey) GP Limited.

NGOs

- Action for the River Kennet.
- Blueprint for Water.
- RSPB.
- Waterwise.
- WWF.

Local Government

- Greater London Authority.
- Hartlepool Borough Council.
- Local Government Association (LGA).
- London Borough of Hammersmith and Fulham.
- Mayor of London.
- Partnership for Urban South Hampshire.

Regulators

- Drinking Water Inspectorate.
- Environment Agency.
- Natural England.
- Environment Agency Floods Committee.

Elected representatives

- Hugh Bayley MP.
- Rt Hon David Cameron MP.
- Councillor Merrick Cockell.
- Sir Patrick Cormack MP.
- Councillor Mike Gittus.

- Philip Hammond MP.
- Greg Hands MP.
- Rt Hon Keith Hill MP.
- John Maples MP.
- Rt Hon Sir Malcolm Rifkind MP.
- Graham Stuart MP.

Appendix 2: Using the CIS matrix

The CIS matrix (figure 16) sets out the relationship between the:

- CIS ratio;
- baseline expenditure; and
- capital expenditure included in price limits.

For companies with a ratio above 100, the capital expenditure included in price limits is the baseline expenditure for that company plus 25% of the difference between our view (the CIS baseline) and the companies' final business plan proposals. For companies with a CIS ratio below 100, the capital expenditure include in price limits is the baseline expenditure less 25% of the difference.

The incentive matrix, in combination with the CIS ratio, determines the capital expenditure incentives package on offer to each company. These incentives are unchanged from those we published in December 2008.

Figure 16 CIS matrix

CIS ratio (company: baseline)	80	85	90	95	100	105	110	115	120	130
Efficiency Incentive	45.00%	41.25%	37.50%	33.75%	30.00%	27.50%	25.00%	22.50%	20.00%	15.00%
Allowed Expenditure	95.00	96.25	97.50	98.75	100.00	101.25	102.50	103.75	105.00	107.5
Additional Income	1.00	0.89	0.69	0.39	0.00	-0.41	-0.88	-1.41	-2.00	-3.38
Actual Expenditure										
70	12.25	11.72	11.00	10.09	9.00	8.19	7.25	6.19	5.00	2.25
80	7.75	7.59	7.25	6.72	6.00	5.44	4.75	3.94	3.00	0.75
85	5.50	5.53	5.38	5.03	4.50	4.06	3.50	2.81	2.00	0.00
90	3.25	3.47	3.50	3.34	3.00	2.69	2.25	1.69	1.00	-0.75
95	1.00	1.41	1.63	1.66	1.50	1.31	1.00	0.56	0.00	-1.50
100	-1.25	-0.66	-0.25	-0.03	-0.00	-0.06	-0.25	-0.56	-1.00	-2.25
105	-3.50	-2.72	-2.13	-1.72	-1.50	-1.44	-1.50	-1.69	-2.00	-3.00
110	-5.75	-4.78	-4.00	-3.41	-3.00	-2.81	-2.75	-2.81	-3.00	-3.75
115	-8.00	-6.84	-5.88	-5.09	-4.50	-4.19	-4.00	-3.94	-4.00	-4.50
120	-10.25	-8.91	-7.75	-6.78	-6.00	-5.56	-5.25	-5.06	-5.00	-5.25
130	-14.75	-13.03	-11.50	-10.16	-9.00	-8.31	-7.75	-7.31	-7.00	-6.75
140	-19.25	-17.16	-15.25	-13.53	-12.00	-11.06	-10.25	-9.56	-9.00	-8.25

Notes:

All figures, except the 'efficiency incentive' line represent percentages of the baseline expenditure amount. The 'efficiency incentive' is the proportion of outperformance against the 'allowed expenditure' that a company will retain. The figures in the lower part of the matrix show the final rewards (positive figures) or penalties (negative figures) for combinations of CIS ratios and actual expenditure. The matrix is continuously calculated using the following functions, and could be applied beyond the range shown here. It is shown as finite options for CIS ratios within the 80 to 130 range to simplify presentation.

For $F > 100$ (where F is the CIS ratio [company: baseline])

Efficiency incentive rate = $0.8 - 0.005F$

Allowed expenditure = $75 + 0.25F$

Additional income = $-5 + 0.175F - 0.00125F^2$

For $F \leq 100$ (where F is the CIS ratio [company: baseline])

Efficiency incentive rate = $1.05 - 0.0075F$

Allowed expenditure = $75 + 0.25F$

Additional income = $-10 + 0.2875F - 0.001875F^2$

Under CIS, companies with lower ratios retain a higher proportion of their outperformance against allowed capital expenditure, and gain higher rewards through additional income. All companies have incentives to achieve outperformance because they can earn higher returns by finding more efficient ways to deliver required outputs.

When we published our draft CIS baselines in December, we noted that the incentives included may not be appropriate or effective if companies continued to exhibit very high ratios. For final determinations, three companies have CIS ratios greater than 130. We have decided to treat these companies as if they had a CIS ratio of 130, while moderating the 'additional income' element of the CIS package (at a flat rate of 0.05% of the baseline for each extra point on the CIS ratio above 130). The adjustment places these companies at a moderate financial disadvantage compared with those companies that achieved CIS ratios of 130 or below.

Approach for companies above 130

In December 2008, we published the CIS matrix. We also recognised that CIS style incentives might not be appropriate if companies have very high CIS ratios. In view of this, in December we stated:

'At this draft baseline stage the CIS ratios for some companies are very high. Companies have the opportunity to improve this in their final business plans. If they continue to show high CIS ratios, we would need to consider whether CIS-style incentives are appropriate for the affected companies.'

One property of the incentive compatible CIS matrix is that efficiency incentives (that is, to achieve outperformance or to avoid capital overspends) become progressively lower for higher CIS ratios. Above a threshold of 130 (that is, an exposure of 15%) we believe that efficiency incentives are inappropriately low.

For our final determinations, we have therefore applied an 'upper limit' to the operation of CIS at a ratio of 130.

We placed the upper limit at 130 because this retains an efficiency incentive of 15%, providing an appropriate level of discipline on capital expenditure. Any company with a worse ratio than 130 is treated as if it had achieved a CIS ratio of 130, less a further (disadvantageous) adjustment to the additional income line. The adjustment to the

additional income item is a further 0.05% (of the baseline) for each extra point on CIS ratio beyond the upper limit of 130.

This approach retains an appropriate level of efficiency incentive for under or outperformance. It also places these companies in a less advantageous position than those within the 'normal CIS', reflecting our judgement that their capital expenditure plans have been substantially over-estimated.

Illustration

To illustrate this, the determination for a company with a CIS ratio of 150 includes:

- an efficiency incentive equal to that for a company with a CIS ratio of 130 (that is, 15% exposure to under or out performance of allowed capital expenditure);
- allowed capital expenditure at 107.5% (as a proportion of the Ofwat baseline) equal to that for a company with a CIS ratio of 130; and
- additional income equal to that for a company with a CIS ratio of 130 (3.38% of baseline) **less** the further small negative additional income adjustment (-0.05% of baseline for each extra point on CIS ratio beyond the upper limit, making a further minus 1% of baseline, or -4.38% in this case).

This approach retains efficiency incentives of sufficient strength, but continues to differentiate between companies on the basis of their CIS ratios.

It is not mathematically possible to maintain the pure 'incentive compatibility' of the CIS matrix, while also retaining sufficiently strong efficiency incentives beyond the upper limit. Our approach therefore prioritises efficiency incentives over the pure CIS structure of incentives for companies beyond the upper limit.

Appendix 3: Aggregate five-year financial information for each company

	Operating costs ¹	Infrastructure renewals charge	Current cost depreciation	Return on capital	Taxation	Total revenue requirement	OPA and revenue adjustments ²	Total revenue after OPA and other adjustments
Water and sewerage companies								
Anglian	1,968	345	1,107	1,413	77	4,910	16	4,926
Dŵr Cymru	1,220	299	628	927	6	3,081	2	3,083
Northumbrian	1,242	217	712	790	216	3,177	-26	3,150
Severn Trent	2,486	586	1,402	1,585	231	6,290	-6	6,284
South West	720	138	496	618	110	2,082	2	2,084
Southern	1,089	255	1,109	898	49	3,399	7	3,406
Thames	3,175	643	1,812	2,202	50	7,882	-72	7,810
United Utilities	2,463	654	1,800	1,949	348	7,215	-113	7,102
Wessex	727	179	469	580	102	2,058	28	2,086
Yorkshire	1,566	258	904	1,178	153	4,060	19	4,079
Water and sewerage total	16,655	3,576	10,440	12,139	1,343	44,153	-144	44,009
Water only companies								
Bournemouth & W Hampshire	87	12	41	35	9	183	0	184
Bristol	227	70	87	86	11	482	-8	474
Cambridge	57	7	13	17	2	96	0	96
Dee Valley	53	9	20	16	2	100	0	100
Portsmouth	94	22	21	27	4	168	1	169
South East	399	109	157	224	13	902	-12	890
South Staffs	212	46	73	58	7	396	4	400
Sutton & E Surrey	132	31	46	47	5	261	-3	258
Veolia Water	519	188	184	184	35	1,110	-15	1,095

Future water and sewerage charges 2010-15: final determinations

Central								
Veolia Water East	33	7	10	16	4	69	0	69
Veolia Water Southeast	42	10	17	18	2	89	0	89
Water only total	1,855	511	668	727	95	3,856	-33	3,822
Industry total	18,510	4,087	11,109	12,866	1,438	48,009	-178	47,831

Notes:

1. Operating costs in this table are £41 million higher than shown in tables 26 and 37 as this table includes the equity issuance transaction costs for the equity injections described in section 5.6.2.
2. Revenue adjustments include the adjustment from the CIS mechanism, recovering the financing costs for shortfalls, applying the enhanced incentive allowance for capital outperformance and the operating expenditure outperformance.

Appendix 4: Regulatory capital value – movement between 2010-11 and 2014-15

(£million)
(2007-08 financial year end prices)

Anglian

	2010-11	2011-12	2012-13	2013-14	2014-15
1. Closing regulatory capital value as at 31 March 2010	5,218				
2. Opening adjustments	89				
3. Regulatory capital value at 1 April	5,307	5,354	5,519	5,674	5,789
4. New investment	347	467	456	415	378
5. Capital maintenance charges	-295	-296	-296	-295	-295
6. Adjustment for roll-out of past capital efficiency	-5	-5	-5	-5	-5
7. Regulatory capital value at 31 March	5,354	5,519	5,674	5,789	5,868

Dŵr Cymru

	2010-11	2011-12	2012-13	2013-14	2014-15
1. Closing regulatory capital value as at 31 March 2010	3,607				
2. Opening adjustments	-15				
3. Regulatory capital value at 1 April	3,592	3,631	3,673	3,707	3,720
4. New investment	235	239	230	211	185
5. Capital maintenance charges	-187	-189	-189	-189	-189
6. Adjustment for roll-out of past capital efficiency	-8	-8	-8	-8	-8
7. Regulatory capital value at 31 March	3,631	3,673	3,707	3,720	3,708

Northumbrian

	2010-11	2011-12	2012-13	2013-14	2014-15
1. Closing regulatory capital value as at 31 March 2010	3,013				
2. Opening adjustments	-39				
3. Regulatory capital value at 1 April	2,974	3,027	3,127	3,196	3,233
4. New investment	242	289	260	230	192
5. Capital maintenance charges	-187	-187	-189	-190	-192
6. Adjustment for roll-out of past capital efficiency	-2	-2	-2	-2	-2
7. Regulatory capital value at 31 March	3,027	3,127	3,196	3,233	3,230

United Utilities

	2010-11	2011-12	2012-13	2013-14	2014-15
1. Closing regulatory capital value as at 31 March 2010	7,387				
2. Opening adjustments	-10				
3. Regulatory capital value at 1 April	7,376	7,462	7,684	7,987	8,248
4. New investment	607	719	812	783	553
5. Capital maintenance charges	-505	-480	-493	-505	-513
6. Adjustment for roll-out of past capital efficiency	-16	-16	-16	-16	-16
7. Regulatory capital value at 31 March	7,462	7,684	7,987	8,248	8,272

Severn Trent

	2010-11	2011-12	2012-13	2013-14	2014-15
1. Closing regulatory capital value as at 31 March 2010	6,239				
2. Opening adjustments	-71				
3. Regulatory capital value at 1 April	6,168	6,216	6,244	6,280	6,341
4. New investment	495	480	489	503	477
5. Capital maintenance charges	-406	-411	-411	-402	-392
6. Adjustment for roll-out of past capital efficiency	-41	-41	-41	-41	-41
7. Regulatory capital value at 31 March	6,216	6,244	6,280	6,341	6,385

South West

	2010-11	2011-12	2012-13	2013-14	2014-15
1. Closing regulatory capital value as at 31 March 2010	2,519				
2. Opening adjustments	-63				
3. Regulatory capital value at 1 April	2,456	2,466	2,490	2,487	2,463
4. New investment	143	162	141	122	100
5. Capital maintenance charges	-120	-126	-131	-133	-135
6. Adjustment for roll-out of past capital efficiency	-13	-13	-13	-13	-13
7. Regulatory capital value at 31 March	2,466	2,490	2,487	2,463	2,416

Southern

	2010-11	2011-12	2012-13	2013-14	2014-15
1. Closing regulatory capital value as at 31 March 2010	3,428				
2. Opening adjustments	-95				
3. Regulatory capital value at 1 April	3,333	3,415	3,562	3,647	3,646
4. New investment	355	434	379	297	280
5. Capital maintenance charges	-261	-274	-281	-285	-286
6. Adjustment for roll-out of past capital efficiency	-13	-13	-13	-13	-13
7. Regulatory capital value at 31 March	3,415	3,562	3,647	3,646	3,627

Thames

	2010-11	2011-12	2012-13	2013-14	2014-15
1. Closing regulatory capital value as at 31 March 2010	7,420				
2. Opening adjustments	176				
3. Regulatory capital value at 1 April	7,595	8,072	8,812	9,293	9,631
4. New investment	988	1,274	1,030	897	704
5. Capital maintenance charges	-468	-490	-506	-516	-517
6. Adjustment for roll-out of past capital efficiency	-43	-43	-43	-43	-43
7. Regulatory capital value at 31 March	8,072	8,812	9,293	9,631	9,774

Wessex

	2010-11	2011-12	2012-13	2013-14	2014-15
1. Closing regulatory capital value as at 31 March 2010	2,150				
2. Opening adjustments	24				
3. Regulatory capital value at 1 April	2,174	2,186	2,240	2,331	2,403
4. New investment	157	200	241	223	193
5. Capital maintenance charges	-128	-129	-133	-134	-136
6. Adjustment for roll-out of past capital efficiency	-17	-17	-17	-17	-17
7. Regulatory capital value at 31 March	2,186	2,240	2,331	2,403	2,442

Yorkshire

	2010-11	2011-12	2012-13	2013-14	2014-15
1. Closing regulatory capital value as at 31 March 2010	4,379				
2. Opening adjustments	24				
3. Regulatory capital value at 1 April	4,403	4,492	4,650	4,803	4,883
4. New investment	345	418	423	361	277
5. Capital maintenance charges	-222	-225	-236	-246	-253
6. Adjustment for roll-out of past capital efficiency	-34	-34	-34	-34	-34
7. Regulatory capital value at 31 March	4,492	4,650	4,803	4,883	4,873

Bournemouth & West Hampshire

	2010-11	2011-12	2012-13	2013-14	2014-15
1. Closing regulatory capital value as at 31 March 2010	131.5				
2. Opening adjustments	2.5				
3. Regulatory capital value at 1 April	134.0	130.8	127.1	125.4	123.9
4. New investment	8.2	8.0	9.6	9.9	8.5
5. Capital maintenance charges	-10.7	-10.9	-10.6	-10.7	-11.0
6. Adjustment for roll-out of past capital efficiency	-0.8	-0.8	-0.8	-0.8	-0.8
7. Regulatory capital value at 31 March	130.8	127.1	125.4	123.9	120.7

Bristol

	2010-11	2011-12	2012-13	2013-14	2014-15
1. Closing regulatory capital value as at 31 March 2010	261.2				
2. Opening adjustments	7.6				
3. Regulatory capital value at 1 April	268.8	283.2	313.8	334.4	344.9
4. New investment	45.4	62.8	53.9	44.2	37.0
5. Capital maintenance charges	-30.2	-31.3	-32.6	-32.9	-32.7
6. Adjustment for roll-out of past capital efficiency	-0.8	-0.8	-0.8	-0.8	-0.8
7. Regulatory capital value at 31 March	283.2	313.8	334.4	344.9	348.4

Cambridge

	2010-11	2011-12	2012-13	2013-14	2014-15
1. Closing regulatory capital value as at 31 March 2010	55.0				
2. Opening adjustments	-1.6				
3. Regulatory capital value at 1 April	53.4	59.0	60.9	61.6	62.3
4. New investment	9.5	6.0	5.0	5.2	4.5
5. Capital maintenance charges	-3.8	-4.0	-4.2	-4.4	-4.4
6. Adjustment for roll-out of past capital efficiency	-0.1	-0.1	-0.1	-0.1	-0.1
7. Regulatory capital value at 31 March	59.0	60.9	61.6	62.3	62.3

Dee Valley

	2010-11	2011-12	2012-13	2013-14	2014-15
1. Closing regulatory capital value as at 31 March 2010	54.8				
2. Opening adjustments	1.2				
3. Regulatory capital value at 1 April	56.0	55.8	59.3	62.7	61.3
4. New investment	5.4	9.4	9.6	5.1	4.6
5. Capital maintenance charges	-5.3	-5.6	-5.9	-6.2	-6.3
6. Adjustment for roll-out of past capital efficiency	-0.3	-0.3	-0.3	-0.3	-0.3
7. Regulatory capital value at 31 March	55.8	59.3	62.7	61.3	59.3

Portsmouth

	2010-11	2011-12	2012-13	2013-14	2014-15
1. Closing regulatory capital value as at 31 March 2010	105.1				
2. Opening adjustments	2.0				
3. Regulatory capital value at 1 April	107.1	105.2	102.0	102.4	98.2
4. New investment	8.4	7.2	10.9	6.2	6.1
5. Capital maintenance charges	-8.7	-8.7	-8.9	-8.8	-8.6
6. Adjustment for roll-out of past capital efficiency	-1.6	-1.6	-1.6	-1.6	-1.6
7. Regulatory capital value at 31 March	105.2	102.0	102.4	98.2	94.0

South East

	2010-11	2011-12	2012-13	2013-14	2014-15
1. Closing regulatory capital value as at 31 March 2010	801.3				
2. Opening adjustments	8.8				
3. Regulatory capital value at 1 April	810.1	838.4	861.4	886.4	906.4
4. New investment	81.7	78.5	80.0	73.5	75.5
5. Capital maintenance charges	-53.1	-55.2	-54.7	-53.2	-54.3
6. Adjustment for roll-out of past capital efficiency	-0.3	-0.3	-0.3	-0.3	-0.3
7. Regulatory capital value at 31 March	838.4	861.4	886.4	906.4	927.4

South Staffs

	2010-11	2011-12	2012-13	2013-14	2014-15
1. Closing regulatory capital value as at 31 March 2010	205.4				
2. Opening adjustments	5.4				
3. Regulatory capital value at 1 April	210.8	217.5	222.4	224.6	222.8
4. New investment	29.9	29.2	28.1	24.1	23.4
5. Capital maintenance charges	-22.3	-23.4	-24.9	-25.0	-24.8
6. Adjustment for roll-out of past capital efficiency	-0.9	-0.9	-0.9	-0.9	-0.9
7. Regulatory capital value at 31 March	217.5	222.4	224.6	222.8	220.4

Sutton & East Surrey

	2010-11	2011-12	2012-13	2013-14	2014-15
1. Closing regulatory capital value as at 31 March 2010	159.4				
2. Opening adjustments	2.6				
3. Regulatory capital value at 1 April	162.0	170.1	176.8	181.1	182.0
4. New investment	23.8	23.0	21.0	17.9	16.2
5. Capital maintenance charges	-14.8	-15.4	-15.8	-16.1	-16.0
6. Adjustment for roll-out of past capital efficiency	-0.9	-0.9	-0.9	-0.9	-0.9
7. Regulatory capital value at 31 March	170.1	176.8	181.1	182.0	181.3

Veolia Central

	2010-11	2011-12	2012-13	2013-14	2014-15
1. Closing regulatory capital value as at 31 March 2010	764.2				
2. Opening adjustments	-26.7				
3. Regulatory capital value at 1 April	737.5	722.2	709.2	702.5	701.4
4. New investment	67.3	70.1	77.2	81.3	69.2
5. Capital maintenance charges	-75.6	-76.1	-77.0	-75.3	-74.3
6. Adjustment for roll-out of past capital efficiency	-7.0	-7.0	-7.0	-7.0	-7.0
7. Regulatory capital value at 31 March	722.2	709.2	702.5	701.4	689.3

Veolia East

	2010-11	2011-12	2012-13	2013-14	2014-15
1. Closing regulatory capital value as at 31 March 2010	58.3				
2. Opening adjustments	0.1				
3. Regulatory capital value at 1 April	58.4	57.3	58.0	56.5	55.0
4. New investment	2.5	4.4	2.3	2.3	2.3
5. Capital maintenance charges	-3.2	-3.4	-3.4	-3.5	-3.5
6. Adjustment for roll-out of past capital efficiency	-0.4	-0.4	-0.4	-0.4	-0.4
7. Regulatory capital value at 31 March	57.3	58.0	56.5	55.0	53.4

Veolia Southeast

	2010-11	2011-12	2012-13	2013-14	2014-15
1. Closing regulatory capital value as at 31 March 2010	64.6				
2. Opening adjustments	0.1				
3. Regulatory capital value at 1 April	64.7	65.1	69.0	73.8	73.9
4. New investment	5.5	9.4	10.4	5.8	3.3
5. Capital maintenance charges	-5.0	-5.4	-5.5	-5.6	-5.4
6. Adjustment for roll-out of past capital efficiency	-0.1	-0.1	-0.1	-0.1	-0.1
7. Regulatory capital value at 31 March	65.1	69.0	73.8	73.9	71.7

Appendix 5: Capital efficiency and outperformance under the CIS

Section 4.2 set out the key features of the CIS including the additional income, the symmetrical approach to the RCV and capital efficiency. In considering the CIS mechanism, companies and other commentators have focused on the additional income factor and assumed the companies will not outperform our final determinations capital expenditure assumptions.

However, the approach to capital efficiency is equally important. A comparison with our approach at previous price reviews will serve to highlight the greater scope for capital expenditure outperformance under CIS. It is important to be aware of these.

- We have used ‘central’ rather than ‘frontier’ efficiency benchmarks in setting capital expenditure assumptions. This means that the efficiency challenge built into our capital expenditure baseline is less tough than at previous price reviews.
- Capital expenditure assumptions in our determinations also reflect a mix of both our view and the company business plan (as set out in the CIS matrix). For companies with CIS ratios greater than 100, this also means that capital expenditure allowed within the determination is higher than under previous price reviews.
- The output expectations for the capital programme are aligned with our baseline assumptions. Companies will only be expected to deliver the output scope assumed by us, not the full range of outputs proposed in their plan (if these were greater in scope and have been subject to a challenge in the determination).

The purpose of the illustration is to show that by outperforming our final determinations capital expenditure, companies are able to achieve a return on equity above that in our assumptions. The extent of this incremental return depends upon the ex ante CIS ratio and the outturn performance; a company with low ex ante CIS ratios and low outturn capital expenditure will achieve the greatest level of outperformance.

Illustration

In this section, we calculate by means of an illustration the returns on equity under a CIS approach and under the frontier efficiency approach adopted at the 2004 price review. The illustration is based on industry data for the final determinations and the cost of equity (7.1%) we have assumed in our final determinations.

In drawing comparisons with our 2004 approach, we have assumed the same level of scope challenge to the final business plans. Our approach at this price review to challenging scope is similar to that used in 2004. Therefore, the difference between the 2009 and 2004 capital expenditure allowed for ex ante in price limits is because of efficiency assumptions.

The base assumptions set out in table 53 reflect the industry position in our final determinations. Under a frontier approach in 2004, we calculate the efficiency assumed in price limits would be about £1.8 billion, compared with £0.4 billion at this review under CIS. The net capital expenditure at this review (after assumed efficiency) is £21.8 billion. The comparable figure using the frontier approach is £20.4 billion (that is, £1.4 billion less). Capital expenditure has been assumed to be profiled evenly over the period 2010-15. Gearing is assumed to be constant at 57.5% and no out-performance is assumed against other cost assumptions.

Table 53 Base assumptions

Base assumptions	£ billion	CIS ratio
Opening RCV	48.0	
Proportion of capex RCV remunerated	80%	
Depreciation assumption (years)	21	
CIS approach in 2009		
Final business plan capex	22.5	104.4
FD CIS baseline	21.5	100.0
Capex included in price limits	21.8	101.1
Frontier approach in 2004		
Equivalent total capex	20.4	
Outturn	19.8	92.0

Tables 54 and 55 compare the return on equity following both the CIS approach and the frontier approach assuming outturn at £19.8 billion. This would be equivalent to an outturn performance at 92% of the 2009 baseline figure. This level of outperformance is relatively conservative, since it is lower than that required to meet the 2004 review style efficiency take assumptions. It is therefore equivalent to outperformance of just over 2% against a determination with a 2004 review style efficiency challenge. (In past review periods, including 2005-10, most companies and the industry aggregate shows some outperformance on capital expenditure. We expect industry outperformance to be around 3.5% for 2005-10).

Table 54 2009 CIS approach

Year		0	1	2	3	4	5
RCV	£ billion	48.0	49.2	50.4	51.4	52.5	53.5
Ex-ante return on equity	%		7.03	7.03	7.03	7.03	7.03
Within period return on equity	%		7.48	7.55	7.61	7.68	7.74
Shadow RCV	£ billion	48.0	48.9	49.8	50.5	51.3	52.0
Ex-post equivalent return on equity	%		7.62	7.65	7.69	7.73	7.77

Table 55 2004 frontier approach

Year		0	1	2	3	4	5
RCV	£ billion	48.0	49.0	49.9	50.8	51.6	52.4
Ex-ante return on equity	%		7.10	7.10	7.10	7.10	7.10
Within period return on equity	%		7.23	7.25	7.27	7.29	7.30
Shadow RCV	£ billion	48.0	48.9	49.8	50.5	51.3	52.0
Ex-post equivalent return on equity	%		7.35	7.38	7.41	7.43	7.46

Ex-ante RCV

The ex-ante RCV is higher under CIS than it would have been under the 2004 frontier approach. This is because:

- a) it will include 25% of the difference in capital expenditure between the CIS baseline and the final business plan; and
- b) the baseline includes a central view, rather than a frontier approach, to efficiency. Under the frontier approach an inefficient company must achieve at least the continuing and frontier shift efficiencies in order to earn the price determination cost of equity.

Ex-ante return on equity

The CIS additional income can have a positive or negative impact on the ex ante equity return. At PR09, CIS ratios that exceed 100 lead to a reduction in ex ante equity returns (table 53). The ex-ante return on equity is always the cost of equity under the PR04 approach (table 54).

Shadow RCV and subsequent calculations of equity returns

Under the CIS mechanism, the RCV will be 'trued up' at the next price review to reflect actual capital expenditure. We present a within period return on equity which assumes all outperformance from capital efficiency accrues to equity. This equity return is calculated on the equity investment that is consistent with the shadow RCV. The shadow RCV represents actual capital expenditure spend based on the assumed actual level of investment.

The final CIS incentive will be calculated in NPV terms according to the incentive payment determined by the CIS matrix (see appendix 2). For the purposes of this example, the ex-post equivalent return on equity includes the effect of the ex-post true up calculations.

Under the 2004 approach, companies retain the benefit of capital outperformance for five years before they are unwound from the RCV. To allow comparison of equity returns, in table 55, we assume capital expenditure outperformance is unwound within the five-year period and the total outperformance incentive calculated in the year in which the efficiency was achieved. The equity returns are then calculated on a comparable basis to the efficiency under the CIS approach.

As can be seen, capital efficiency under both approaches leads to higher equity returns, but the 2009 approach with CIS earns more – about 29 basis points a year on average.

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Matthew Pencharz
Mayoral Adviser, Environment and Political
Affairs
GLA

6 July 2012

Dear Matthew

Health and Environment Committee Meeting – 3 July 2012

Thank you very much for your contributions at the London Assembly's Health and Environment Committee meeting on 3 July. You will recall that, during the meeting, we agreed you would provide further information on a couple of issues. I would appreciate it if you could therefore provide the following written information:

- Confirmation on whether newer taxi cabs are more polluting than older ones.
- An explanation of the rationale behind the Mayor's decision to impose a 15-year cut off point to identify the most polluting taxi cabs as opposed to an annual assessment to determine whether they should remain in operation.
- A copy of the Mayor's written response to the letter jointly submitted by the boroughs of Camden and Westminster, and the City of London, (dated 15 June), setting out proposals for further action to help improve air quality within London's boundaries (copy enclosed).

Thank you for agreeing to provide further written responses as well as attending the Committee's meeting. The Committee would be grateful to receive your response by the end of July. If you can copy your response electronically to ian.williamson@london.gov.uk, that would be very helpful.

Yours sincerely,



Murad Qureshi AM
Chair of the Health and Environment Committee

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Elaine Seagriff
Head of London Wide Policy & Strategy
Planning
Transport for London

6 July 2012

Dear Ms Seagriff

Health and Environment Committee Meeting – 3 July 2012

Thank you very much for your contributions at the London Assembly's Health and Environment Committee meeting on 3 July. You will recall that, during the meeting, we agreed you would provide further information on the projected increase in mode share for walking and cycling by 2015.

Thank you for agreeing to provide this further information as well as attending the Committee's meeting. The Committee would be grateful to receive your response by the end of July. If you can copy your response electronically to ian.williamson@london.gov.uk, that would be very helpful.

Yours sincerely



Murad Qureshi AM
Chair of the Health and Environment Committee

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Subject: Update on NHS and Public Health Reform in London

Report to: Health and Environment Committee

Report of: Executive Director of Secretariat

Date: 12 September 2012

This report will be considered in public

1. Summary

- 4.1 This report sets out the background for a discussion with representatives from NHS London, the Kings Fund and other guests, on the challenges and impacts of NHS and public health reform in London.

2. Recommendation

- 2.1 **That the Committee notes this report as background to the discussion with health experts.**

3. Background

- 3.1 The Health and Social Care Act 2012 sets out a major restructuring of healthcare services and of public health responsibilities due to be in place by April 2013. The main changes are:
- The abolition of NHS London, the strategic Health Authority and Primary Care Trusts (PCTs), which have been responsible for most commissioning;
 - Moving responsibility for most commissioning to clinical commissioning groups (ccgs) made up of GPs and other health professionals;
 - Setting up a National Commissioning Board (NCB) to oversee the clinical commissioning groups and to take responsibility for commissioning specialist services, dentists and primary care; and
 - Local authorities taking on responsibility for public health issues like obesity, alcohol misuse, smoking and sexual health from April 2013, with oversight from public health England, a national body that will also be responsible for health protection.
- 3.2 These changes are aimed at providing patients with more choice and control over their healthcare, improving healthcare outcomes and allowing health professionals more freedom to exercise professional judgement about patient care.¹ The reforms will pose significant challenges for London, in terms of the size and scale of the changes required, the timeframe in which to deliver the changes

¹ EQUITY AND EXCELLENCE: LIBERATING THE NHS, DEPARTMENT OF HEALTH, JULY 2010

[HTTP://WWW.DH.GOV.UK/HEALTH/2011/07/LIBERATING-THE-NHS/](http://www.dh.gov.uk/health/2011/07/liberating-the-nhs/)

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and ensuring the strategic perspective of healthcare and public health in London is maintained post April 2013.

- 3.3 Around seven months of the transitional phase to the new structure remain. A further challenge for the NHS in London during this period will be to continue to deliver the full range of health care services, whilst working towards its contribution to making £15-20 billion efficiency savings under the national Quality Innovation Productivity and Prevention (QIPP) Programme by 2015.² Savings made from the QIPP are to be reinvested in frontline care to provide continual improvement in the quality of care patients receive.
- 3.4 The Assembly's predecessor Health and Public Services Committee (HSPC) regularly heard from and questioned the Chief Executive of NHS London, the strategic Health Authority for London,³ and the Regional Director of Public Health in London and other key experts, about progress in implementing the changes, and the challenges they pose for healthcare and public health in the city, both now and in the future. The most recent briefing took place on 18 January 2012.⁴ This Committee will continue to receive such briefings in the run up to April 2013.
- 3.5 This meeting will update members on:
- the transition and change programme for health services and healthcare provision in London;
 - the current consultation programme on plans to reorganise Accident and Emergency care ; and
 - public health funding and responsibility and accountability under the new structure

Health services and healthcare provision

- 3.6 From April 2013, the majority of health services (including specialist health services, dentists and primary care) will be commissioned by local clinical commissioning groups (CCGs), made up of GPs and other health professionals. CCGs will be accountable to an independent NHS Commissioning Board (NHS CB)⁵, which will operate four regional hubs and 27 local offices. The primary purpose of the regional hubs, of which one is in London, will be to implement national policy.
- 3.7 CCGs will be able to commission services from any qualified provider, meaning that NHS hospitals and mental health trusts will compete with each other to provide services, and potentially with private and voluntary sector providers. Key to competing for business from CCGs will be the ability to demonstrate effective financial management and/or high service quality. NHS trusts are able to demonstrate this by achieving Foundation Trust status.⁶ Trusts that do not become foundation trusts (FT) are likely to struggle to compete for business from CCGs. There are a high proportion of acute hospital trusts in London that have yet to achieve FT status.
- 3.8 There are significant financial challenges to delivering the new management and commissioning structure. There will be a 50 per cent reduction in commissioning running costs in London.⁷ Whilst NHS London is committed to making significant efficiency savings as part of the national QIPP programme, an overall deficit in excess of one million is forecast for London's acute sector in

² SEE [HTTP://WWW.DH.GOV.UK/HEALTH/CATEGORY/POLICY-AREAS/NHS/QUALITY/QIPP/](http://www.dh.gov.uk/health/category/policy-areas/nhs/quality/qipp/)

³ SEE [HTTP://WWW.LONDON.NHS.UK/](http://www.london.nhs.uk/)

⁴ A TRANSCRIPT OF THE DISCUSSION IS AVAILABLE AT

[HTTP://WWW.LONDON.GOV.UK/MODERNGOV/IELISTDOCUMENTS.ASPX?CID=148&Mid=4353](http://www.london.gov.uk/moderngov/ielistdocuments.aspx?CID=148&Mid=4353)

⁵ ESTABLISHED IN OCTOBER 2011 [HTTP://WWW.COMMISSIONINGBOARD.NHS.UK/ABOUT/](http://www.commissioningboard.nhs.uk/about/)

⁶ FOUNDATION TRUSTS ARE TAILORED TO THE NEEDS OF THE LOCAL POPULATION. THEY ARE RUN BY LOCAL MANAGERS STAFF AND MEMBERS OF THE PUBLIC AND HAVE MORE FINANCIAL AND OPERATIONAL FREEDOM THAN OTHER NHS TRUSTS. THEY WERE FIRST INTRODUCED IN APRIL 2004

⁷ PAGE 5, HEALTH AND PUBLIC SERVICES COMMITTEE TRANSCRIPT 18 JANUARY 2012

[HTTP://WWW.LONDON.GOV.UK/MODERNGOV/IELISTDOCUMENTS.ASPX?CID=148&Mid=4353](http://www.london.gov.uk/moderngov/ielistdocuments.aspx?CID=148&Mid=4353)

2011/12. An added challenge is that NHS London will cease to operate from 2013, potentially leaving a vacuum for a strategic overview on health services and provision in London.

Accident and Emergency care

- 3.9 North West London NHS Trust is currently consulting on proposals to reorganise the delivery of accident and emergency care (A&E) across North West London. The consultation document, *Shaping a healthier future*,⁸ sets out a series of recommended changes and options aimed at improving patient care. The changes will span a large geographical area and impact a significant number Londoners. The Assembly wishes to ensure that patient care is not adversely affected and on 11 July 2012 passed a motion noting its concerns and highlighting need to maintain the highest levels of emergency care across the whole of London.⁹

Public health

- 3.10 A three-tier national structure will be established as the service provider for public health. A national body called Public Health England (PHE) will be supported by four regional hubs, one in London, and a number of local units, the precise number yet to be confirmed at the time of writing.¹⁰ At local level, local Authorities will be required to appoint a Director of Public Health and to establish a Health and Wellbeing Board (HWB) to help discharge its functions under the Act. HWBs will be responsible for encouraging integrated working and developing Joint Strategic Needs Assessments and joint Health and Wellbeing Strategies. HWBs are currently operating in shadow will assume statutory responsibility from April 2013. They are in the process of developing their Health and Wellbeing Strategies.
- 3.11 At the London level, the Mayor, in partnership with the NHS and London boroughs, through the London Health and Improvement Board (LHIB),¹¹ is working to develop and deliver a pan-London work programme to improve Londoner's health and reduce health inequalities. LHIB was set up in shadow form in 2011 and will assume statutory status in April 2014. LHIB's priority work areas for 2012/13 are childhood obesity, alcohol misuse, prevention and early diagnosis of cancer, and improving the availability, sharing and use of health data.

4. Issues for Consideration

- 4.1 Experts invited to participate in the briefing and answer the Committee's questions include:
- Dame Ruth Carnall DBE, Chief Executive, NHS London;
 - Dr Simon Tanner, Regional Director of Public Health, NHS London and Health Advisor to the GLA;
 - Dave Buck, Senior Fellow, Public Health and Inequalities, The Kings Fund;
 - Professor Adrian Renton, Director, Institute for Health and Human Development, University of East London; and
 - A representative from the Greater London Authority.

5. Legal Implications

- 5.1 The Committee has the power to do what is recommended in the report.

⁸ [HTTP://WWW.HEALTHIERNORTHWESTLONDON.NHS.UK/DOCUMENT/SHAPING-HEALTHIER-FUTURE-CONSULTATION-DOCUMENT](http://www.healthiernorthwestlondon.nhs.uk/document/shaping-healthier-future-consultation-document)

⁹ [HTTP://WWW.LONDON.GOV.UK/MEDIA/PRESS_RELEASES_LONDON_ASSEMBLY/LONDON-NEEDS-HIGHEST-LEVELS-AE-CARE-SAYS-ASSEMBLY](http://www.london.gov.uk/media/press_releases_london_assembly/london-needs-highest-levels-ae-care-says-assembly)

¹⁰ HEALTH SERVICE JOURNAL. 20 DECEMBER 2011 [HTTP://WWW.HSJ.CO.UK/NEWS/POLICY/DH-REVEALS-PLANS-FOR-PUBLIC-HEALTH-ENGLAND-STRUCTURE/5039542.ARTICLE](http://www.hsj.co.uk/news/policy/dh-reveals-plans-for-public-health-england-structure/5039542.article)

¹¹ [HTTP://WWW.LHIB.ORG.UK/](http://www.lhib.org.uk/)

6. Financial Implications

6.1 There are no financial implications arising from this review.

List of appendices to this report:

There are none.

Local Government (Access to Information) Act 1985
List of Background Papers: There are none.
Contact Officer: Carmen Musonda, Scrutiny Manager Telephone: 020 7983 4351 E-mail: carmen.musonda@london.gov.uk

Subject: Tackling Childcare Affordability in London - Next Steps

Report to: Health and Environment Committee

Report of: Executive Director of Secretariat

Date: 12 September 2012

This report will be considered in public

1. Summary

- 1.1 The Committee is asked to note responses to the report of the predecessor Health and Public Services Committee (HPSC), *Tackling childcare affordability in London* published on 22 February 2012, and the attached paper setting out proposed follow up action the Health and Environment Committee could take.

2. Recommendation

- 2.1 **That the Committee note the responses to the predecessor Health and Public Services Committee's report, *Tackling childcare affordability in London* received from the Department for Work and Pensions, the Department for Education, the Mayor, and London Councils (attached as appendices).**
- 2.2 **That the Committee agrees to hold a follow-up meeting in spring 2013.**

3. Legal Implications

- 3.1 The Committee has the power to do what is recommended in the report.

4. Financial Implications

- 4.1 There are no financial implications arising from this review.

List of appendices to this report:

Appendix 1: Proposal paper for Committee follow up work on the *Tackling childcare affordability in London* report;

Appendix 1a: Response to *Tackling childcare affordability in London* report from the Department for Work and Pensions;

Appendix 1b: Response to *Tackling childcare affordability in London* report from the Department for Education;

Appendix 1c: Response to *Tackling childcare affordability in London* report from the Mayor; and

Appendix 1d: Response to *Tackling childcare affordability in London* report from London Councils.

Local Government (Access to Information) Act 1985

List of Background Papers:

There are none.

Contact Officer: Carmen Musonda, Scrutiny Manager

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Tackling childcare affordability in London: Next steps

The London Assembly's Health and Public Services Committee (HPSC) agreed terms of reference for a review of childcare provision in London at its meeting on 13 September 2011; they were:

To examine what more can be done to improve Londoners' access to suitable childcare, focusing on:

- improving information and advice;
- making childcare more affordable; and
- improving access to suitable provision and in particular, out of hours provision.

Written views and information were sought from a wide range of stakeholders including parents, childcare providers, London boroughs, charities, academics and think tanks. The *Tackling childcare affordability in London* report was published on 22 February 2012. Victoria Borwick AM, Chair of the HPSC held a number of meetings with key regional and local stakeholders to build momentum for implementation of the recommendations.

Childcare is currently one of the top financial burdens on families across the country. In July, the Daycare Trust, a national childcare charity, published findings from its annual surveys on childcare costs. The first, the Annual Childcare costs survey, showed above-inflation increases in the price of nursery care in Britain with the hourly rate for a child aged under-two up 5.8 per cent, and for a child aged two and over the increase is 3.9 per cent. The second, the Annual Holiday Childcare costs survey showed that childcare costs had risen to record levels over the summer. The average cost of one week's holiday childcare stands at £99.87 - up three per cent on the previous year, leaving an average family with two children facing a childcare bill of £1,200 during the school holidays. The most expensive childcare provider identified by the study charged £400 a week for care in London.¹

Given the importance of this issue in terms of supporting employment, and particularly female employment, the Committee is advised to consider further follow-up action.

Responses to the report

The report received widespread positive coverage on LBC, BBC London Radio and TV, and the Evening Standard as well as trade press such as Children and Young People Now and Nurseryworld. The report was endorsed by Daycare Trust and by The Pre-school Learning Alliance, the largest early years and childcare membership organisation in England. Responses to the report were received from the Department for Work and Pensions, the Department for Education, the Mayor, and London Councils and are attached to this paper.

In summary responses were as follows:

Recommendation 1

The Minister for Welfare Reform should develop the childcare element of Universal Credit so that the maximum amount families can claim varies according to local childcare costs.

¹ The Annual Childcare costs survey 2012 and the Holiday Childcare costs survey 2012, <http://www.daycaretrust.org.uk/pages/childcare-costs-survey-2012.html>
City Hall, The Queen's Walk, London SE1 2AA

Enquiries: 020 7983 4100 minicom: 020 7983 4458 www.london.gov.uk

- The Department for Works and Pensions confirmed that while it would not be possible to look at developing regional variations for the childcare element of Universal Credit within the existing timeframes for implementing the benefit, there may be scope to explore it in the future, and has offered to keep the Committee updated on progress.

Recommendation 2

The Department for Education should explore the possibility of reweighting the level of grant funding given to local authorities for the free entitlement to early education so that this funding takes more account of the local costs of provision.

- In its' recent consultation on school funding reform,² the Department for Education committed to continuing to work towards a fair early years funding formula over the next few years.

Recommendation 3

The Mayor should include improving access to early years' education within his education inquiry, including a focus on tackling London's low uptake of the free entitlement to early education for three and four year olds.

- GLA officers are working with London Councils, Directors of Children's Services and Heads of Early Years to highlight key delivery challenges to the rollout of early years/childcare offer in London. The independent Education Inquiry Panel set up by the Mayor is considering how best it might add value to what is already being done to improve access to early years' education.

Recommendation 4

The Mayor should run an information campaign to encourage London employers to offer childcare voucher schemes. The Mayor should undertake this work by November 2012.

- GLA officers are gathering information and reviewing the viability of a mayoral-led campaign to encourage London employers to offer childcare voucher schemes; this work should be completed by the end of November 2012.

Recommendation 5

London Councils should promote good practice in improving access to affordable childcare across London. It should draw up a plan for this work by June 2012.

- Officers at London Councils are exploring the option of hosting a seminar for elected members in the autumn, to supplement ongoing work to promote good practice in improving access to affordable childcare through existing networks.

Recommendation 6

London Councils should develop a register of organisations willing to consider managing and running nurseries linked to Children's Centres, and maintaining them as affordable childcare options, and make this register available to all London boroughs. They should set this register up by June 2012

- London Councils is consulting with Boroughs to gauge the appetite and potential scope for developing a register of organisations willing to consider managing and running nurseries linked to Children's Centres.

² Next steps towards a fairer system, March 2012
<https://www.education.gov.uk/publications/standard/publicationDetail/Page1/DFE-00029-2012>

Next steps

Government action

The Prime Minister announced the launch of a new Government Commission to look into childcare in June 2012. The commission will be led by the Education Minister Sarah Teather and Work and Pensions Minister Maria Miller. The Commission will look at:

- ways to encourage out of hours provision, so that parents are able to access care for their child when they need it;
- identifying any regulation that is not needed to ensure safety or quality; and
- how childcare helps to get parents into work and out of poverty.³

The Commission issued a formal call for evidence and ideas on ways to increase childcare provision and cut the cost on 19 July, which ran until 31 August 2012. The Commission will report to the Prime Minister and Deputy Prime Minister in the autumn. The Committee's report was submitted to the Commission as a contribution.

Committee follow up

The Committee could usefully hold a follow up session in spring 2013, at which it could receive an oral update on progress made by the Mayor and London Councils in meeting the recommendations. The actions set out in each of the responses are due to be completed or will be close to completion by the end of 2012. The meeting would also consider recommendations from the Government Commission and their implication for London.

The Government has committed to extending free early education to the most deprived two year olds. Three and four year olds are all entitled to 15 hours free early education per week for 38 weeks of the year. From September 2013, local authorities will be expected to offer 570 hours a year of free early education to the 20 per cent most deprived two year olds in their area, rising to the 40 per cent most deprived by 2014/15. Some local authorities may find it challenging to find the capacity to provide these places, and it may therefore be worth the Committee asking for an update from London Councils on the implementation of this commitment.

Stakeholder engagement

A wide range of stakeholders contributed to the report and maintaining their involvement in any follow up work the Committee undertakes is vital. As an initial step, the Committee could consult with these stakeholder groups, seeking their feedback on the responses to the report and to discuss their involvement in the Committee's follow-up meeting in spring 2013.

³ <http://www.independent.co.uk/news/uk/politics/government-to-launch-childcare-commission-7865510.html>

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From the Parliamentary
Under Secretary of State
for Work and Pensions

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30 May 2012

Dear Victoria,

In February you sent me your report *Tackling childcare affordability in London*, and I very much welcome its contents. In particular, I agree that the link you outline between childcare and employment is a really important factor for people who are bringing up children in some of the UK's toughest environments, in London as well as across the rest of the country.

My officials are working with expert stakeholders to consider the optimum delivery mechanism for the childcare element within Universal Credit. One of our key aims is to minimise complexity and the confusion that is inherent in the current system, so that claimants understand the rules better.

Your first recommendation was directed to me, and advised that we: *"should develop the childcare element of Universal Credit so that the maximum amount families can claim varies according to local childcare costs"*

As you are aware, local variations in childcare costs is not something we currently plan to offer in Universal Credit. We do acknowledge that costs can vary across the country and I agree that your recommendation is an interesting idea, which we may be able to explore further in the future. However, the exciting demands of welfare reform, especially creating the new Universal Credit benefit next year, mean that, at this stage, we are not able to look at regionalisation of childcare within those deadlines.

After the introduction of Universal Credit, we may have scope to try different approaches and I have asked my officials to keep you updated on progress.

Yours sincerely
David

LORD FREUD
MINISTER FOR WELFARE REFORM

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2012/0017336POST

Sarah Teather MP

Minister of State for Children and Families

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 tel: 0370 0002288 ministers@education.gsi.gov.uk

Victoria Borwick
 Chair, Health and Public Services Committee
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12th April 2012

Dear Ms Borwick,

Thank you for your letter of 12 March, and for sending me a copy of your recent report, *Tackling childcare affordability in London*. Your report raises some important issues and suggests action which could be taken at all levels of government to make high quality childcare more affordable.

The Government is committed to increasing the availability of high quality early years provision, whilst at the same time reducing costly and unnecessary bureaucracy. Our reforms to the Early Years Foundation Stage (EYFS) will improve how young children learn in early years settings by freeing up practitioners' time to focus on the areas that are most essential for children's healthy development. We have also consulted recently on clearer and simpler quality criteria that providers of the free entitlement to early education must meet in order to access funding. Both of these reforms will come into force from September 2012.

Your report recommends that the Department should review how local authorities are funded to provide free early education so that funding takes more account of the local cost of provision. The Government recognises that funding levels for the free entitlement can be controversial which is why, since April 2011, we required all local authorities to introduce an early years single funding formula to improve the fairness and transparency of the funding that they allocate to early years providers. We also recently published a consultation on school funding reform, *Next steps towards a fairer system*, which also looks at early years funding. In it we recognise that getting the components and implementation of a fair early years funding formula for local authorities right is critical. In the consultation we commit to continuing to work towards this over the next few years so that this can be done alongside a national funding formula for schools and with minimal disturbance for local authorities and providers.

Early education is a high priority for the Government because of the benefits it brings for children's development as well as the support it provides to help parents balance work and family life. This is why we are extending the free entitlement to early education to 40 per cent of two year olds from 2014, with additional investment of £760m per year, which will create many more free places in London and across the country.

We also recognise the importance of making the free entitlement to early education for two, three and four year olds as flexible as possible to meet parents needs, whilst ensuring that it is delivered at the times that best enable children to learn. Local authorities are already required to ensure that children can access their free entitlement sessions in three hour blocks over five days a week, or in five hour blocks over three days a week. From September, we plan to allow the full 15 hours of free entitlement to be taken over two days a week rather than three and between 7am and 7pm (rather than 8am-6pm as now). We will, however, retain the maximum of ten hours in one day. We are also clarifying the circumstances in which schools can charge parents for additional hours of early education, above the free entitlement, in the way that private providers are able to do.

We hope that the new two year old entitlement and the improvements to flexibility will increase take-up of free early education, particularly by the most disadvantaged children, and make it easier for parents to work or study.

Thanks you again for your letter and for the copy of your report. I hope that my comments are helpful, and that you are reassured that reforms are already underway.



S.P. **Sarah Teather MP**
Minister of State for Children and Families

GREATER LONDON AUTHORITY

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Victoria Borwick AM

London Assembly
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 The Queen's Walk
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Our ref: MGLA140312-6630**Date:****19 APR 2012**

Dear Victoria

Thank you for your letter and the attached copy of the London Assembly Health and Public Services Committee's report on childcare affordability in London. I welcome the Committee's careful and comprehensive review of this very important issue.

Officers are already taking forward work on the Committee's recommendations, as follows:

Recommendation 3

The Mayor should include improving access to early years' education within his education inquiry, including a focus on tackling London's low uptake of the free entitlement to early education for three and four year olds.

This recommendation was drawn to the attention of the independent Education Inquiry Panel at their meeting on 14 March 2012. It was agreed that the secretariat would provide a note on current activity in this area to inform the Panel's views on how best the Education Inquiry might add value to work presently being progressed in this area

Following a roundtable on early years held by Pamela Chesters, my Advisor on Health and Families in January 2012, officers are working with London Councils, Directors of Children's Services and Heads of Early Years to highlight key delivery challenges to the rollout of the early years/childcare offer in London.

I have already highlighted these challenges in my recent response on the government's consultation on the free early years education offer for disadvantaged two year olds and in my earlier response to the consultation on the national child poverty strategy, as well as the submission to the Frank Field Review.

Recommendation 4

The Mayor should run an information campaign to encourage London employers to offer childcare voucher schemes. The Mayor should undertake this work by November 2012.

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Officers are gathering information on this issue and reviewing future work programmes and budgets to recommend priorities for action, taking account of where the GLA can best add value and the impact, costs and benefits of different options.

I expect a way forward to be agreed by the end of June, with a view to completing the work by the end of November 2012.

Yours ever,

A handwritten signature in black ink, appearing to be 'Boris Johnson', written in a cursive style.

Boris Johnson
Mayor of London

Victoria Borwick
Chair of the Health and Public Services
Committee
City Hall
The Queen's Walk
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London
SE1 2AA

Contact: Lai Chong-Siltola
Direct line: 020 7934 9572
Email: Lai.chong-
siltola@londoncouncils.gov.uk

Date: 13 March 2012

Dear Victoria,

Tackling childcare affordability in London report – recommendations for London Councils

Thank you for sending me your recently published *Tackling childcare affordability in London* report. I found it helpful in highlighting the barriers London parents face in accessing good quality childcare. I appreciated having the opportunity to contribute evidence to the review and to meet with you prior to publication of the report. Clearly, you have recognised the crucial role that local authorities play in ensuring affordable childcare provision is available locally.

I wanted to take this opportunity to respond to some of the recommendations set out in the report. I was pleased to see that the report's first two recommendations echoed London Councils' calls to government to ensure:

- a) that the childcare element of Universal Credit reflects local costs
- b) that the level of grant funding given to boroughs for the free entitlement to early years education reflects the local costs of provision - especially as the offer for the most disadvantaged two year-olds will be rolled out nationally in September 2013 and London already faces considerable issues of capacity.

With regard to recommendation 5, London Councils already promotes good practice through a number of networks that we are involved with or run. The London Child Poverty Network, a grouping of borough child poverty leads with representatives from government departments and the voluntary and community sector, meets regularly to discuss and share good practice on a range of topics including childcare. The Association of London Directors of Children's Services meetings also provide a forum to share and promote good practice at a more strategic level. As I mentioned in our meeting, these opportunities could be supplemented by a seminar for elected members and I have asked officers at London Councils to explore the option of holding an event in autumn 2012.

The recommendation for London Councils to set up a register of organisations willing to consider managing nurseries linked to Children's Centres would need more consideration before we are in a position to deliver on this. Therefore, we will consult the Boroughs to gauge the appetite and potential scope for a register of this sort. We would be happy to work with you to see if an interested third sector partner would be willing to undertake this work.

I hope that you find my comments helpful and thank you once again for inviting London Councils to make a submission to the review and for a copy of the report.

Yours sincerely

A handwritten signature in blue ink that reads "Steve Reed". The signature is written in a cursive style with a horizontal line underneath the name.

Cllr Steve Reed
London Councils Executive Member for Children's Services and Skills and Employment

Subject: Playing Fields Update

Report to: Health and Environment Committee

Report of: Executive Director of Secretariat

Date: 12 September 2012

This report will be considered in public

1 Summary

- 1.1 This report provides an update on developments since the 2006 Environment Committee rapporteurship on playing field loss. Recent Sport England data indicates that there has not been any significant change in the number of playing field sites in London, though it appears that the number of pitches marked out on the sites may have fallen since 2010.¹ The data indicate a relatively small number of sites that have fallen completely out of use as playing fields and therefore are at greater risk of being sold off or built on. Following the rapporteurship's recommendations, there is now additional protection specifically for playing fields in the London Plan.
- 1.2 Recent media reports highlight that school playing fields are still sometimes sold off, though at a much slower rate than in the 1980s and 1990s. Ministers maintain that appropriate safeguards for school sports facilities are in place. The Mayor has commented on the debate, in support of school sport and the protection of playing fields.

2 Recommendation

- 2.1 **That the Committee note the information received from Sport England and the other developments on playing field availability and protection set out in this report.**
- 2.2 **That the Committee authorise the Chair, in consultation with Party Group leads, to write to Sport England expressing the Committee's views and in particular to seek information on what is being done to protect or monitor a number of playing fields in London identified by Sport England as being at-risk.**

3 Issues for consideration

- 3.1 This report covers the following issues:
- The findings of the 2006 rapporteurship for the Environment Committee (section 4)
 - Trends in playing pitch and site numbers since 2006, and Sport England's monitoring of them, including identification of sites 'at-risk' (section 5)
 - Disposal of school playing fields (section 6)
 - Mayoral policy (section 7)

¹ **Sites** refers to separate pieces of land, **pitches** to the individual playing areas marked out on each site. Pitches marked may vary seasonally as well as from year to year, as the sites are managed to serve different sports uses. The average number of pitches per site was about four in London in January 2012.

4 London playing fields - 2006 baseline

- 4.1 In 2006, the Environment Committee published a rapporteur report by Murad Qureshi AM on the availability and protection of playing fields in London.² The report stressed the importance of access to playing fields as green spaces and for health benefits, recommended safeguards for playing fields, and sought to evaluate trends in playing field numbers and establish a baseline for future monitoring.
- 4.2 The report found that it was difficult to quantify past trends in playing field numbers, as different data sets used different definitions and reporting methods, and none could be found to be comprehensive and accurate. However, the overall indication was that there had been a 'significant loss of playing fields in London since the 1980s'.
- 4.3 The report found that there were about 1,500 available playing pitch sites in London, of which around 1,300 had grass playing pitches only, about 60 had artificial pitches only, and about 80 had both types of pitches. The number of pitches at each site was not at that time recorded. The large majority of sites (about 1,200) were found in outer London and only about 230 in inner London.

5 London playing fields – recent data

- 5.1 As far as can be established, there has not been a large change in the number of pitch sites in London since 2006. There have still been difficulties with data quality; in particular, a revision of Sport England's database in 2010 removed many entries that were duplicates or otherwise invalid. This makes comparison with the 2006 figures difficult, and even between 2009 and 2010 data. The numbers of pitches reported by Sport England are therefore presented here in two tables.

Table 1: Grass pitches in London 2007-2009

Date	August 2007	July 2008	January 2009
Number of sites	1367	1377	1384
Number of pitches	4594	4606	4565

Source: Sport England – see **Appendix 1**

Table 2: Grass pitches in London 2010-2012

Date	January 2010	January 2011	January 2012
Number of sites	1225	1213	1232
Number of pitches	4929	4779	4815

Source: Sport England – see **Appendix 1**

- 5.2 In these figures, the number of sites has increased by about 1 per cent from 2010 to 2012, but the number of pitches reported as marked on the sites has fallen by about 2 per cent in the same period.
- 5.3 Sport England reports that many of the additions and deletions to its database represent corrections to the data rather than real changes in sites on the ground: for example in 2011, fourteen sites were

² *Offside: the loss of London's playing fields*, London Assembly 2006 <http://www.london.gov.uk/who-runs-london/the-london-assembly/publications/health/offside-loss-londons-playing-fields>

added or deleted due to data error, and seven deleted because they were found to be duplicate entries; in 2012, thirty existing but previously unrecorded sites were added to the database. Sport England's paper for this committee, attached as Appendix 1, details these changes.

- 5.4 However, there have been 25 sites identified in this period as 'at-risk' (see Appendix 1, table 4). These are sites which are not currently used as playing fields – either closed or just not marked out with pitches. Sport England does not state why these pitches are at-risk, but has previously noted reasons for being at-risk as including:
- low demand;
 - poor maintenance or condition, or high cost of maintenance;
 - poor drainage or flooding;
 - problems with the ownership or management of the site, such as when a small football club folds or when there is a dispute between the local authority and a developer;
 - planned use of the site for another purpose eg a new or relocated school, or sports on non-grass surfaces such as tennis or cycling; and
 - small size of the site.
- 5.5 Disused playing fields are particularly at risk because sites that have not been used for five years are no longer protected by legislation requiring Sport England to be consulted on applications to develop playing fields owned by local authorities and schools, and for the Secretary of State to be consulted if the planning authority wishes to allow development despite Sport England objections.

Inner and Outer London

- 5.6 There are many fewer playing pitches in Inner London than in Outer London, as shown in Table 4 below. On 2011 Census population data,³ the 2011 pitch numbers correspond to one pitch per 1216 residents in Outer London but one per 4520 residents in Inner London.

(table on next page)

³ <http://data.london.gov.uk/datastorefiles/datafiles/demographics/2011-census/2011-census-comparison-data.xls> - Inner London 3.232 million, Outer London 4.942 million. The Census definitions group Newham and Haringey with Inner London, and Greenwich with Outer London – this gives Inner London 715 pitches in 2011 and Outer London 4064; the per-person figures in paragraph 5.6 are based on these pitch numbers. Table 4 uses the definitions of the London Government Act 1963 / London County Council / ILEA just as in the data provided to us by Sport England.

Table 4: Grass Pitches in inner and outer London boroughs 2010-2012

Date	January 2010	January 2011	January 2012
Barking & Dagenham	157	136	134
Barnet	350	331	333
Bexley	210	199	201
Brent	125	130	131
Bromley	399	397	405
Croydon	204	207	210
Ealing	215	193	197
Enfield	306	277	278
Haringey	79	80	76
Harrow	224	217	226
Havering	168	184	184
Hillingdon	340	345	340
Hounslow	248	213	212
Kingston-upon-Thames	139	141	149
Merton	129	135	131
Newham	60	60	60
Redbridge	271	257	263
Richmond-upon-Thames	255	261	262
Sutton	132	136	131
Waltham Forest	134	123	123
Outer London	4145	4022	4046
Camden	14	14	14
City of Westminster	48	49	49
Greenwich	185	182	186
Hackney	104	95	98
Hammersmith & Fulham	31	36	38
Islington	7	7	7
Kensington & Chelsea	4	5	5
Lambeth	43	26	26
Lewisham	101	98	95
Southwark	92	87	98
Tower Hamlets	28	29	24
Wandsworth	127	129	129
Inner London	784	757	769
All London	4929	4779	4815

Source: Sport England – see Appendix 1

Artificial grass pitches

5.7 The number of artificial grass pitches in London is still much lower than the number of grass pitches, but is increasing, as shown in Table 3 below.

Table 3: Artificial grass pitches in London 2010-2012

Date	January 2010	January 2011	January 2012
Number of sites	164	175	190
Number of pitches	182	194	210

Source: Sport England – see Appendix 1

6 School playing fields

- 6.1 The information above, from Sport England, relates to all playing fields on the Sport England database in London. These playing fields include a wide variety in both public and private ownership. School playing fields are a particular category of playing fields with specific rules governing them and specific sources of information about them.
- 6.2 According to recent press reports based on DfE statements, an estimated 10,000 school playing fields were disposed of between 1979 and 1997 nationwide – this would be in the order of 500 per year. Since 1997, successive Governments have pledged to protect school playing fields, and the number of sales has fallen. Between 1999 and April 2010, 213 disposals were approved by the DfE – around 20 per year. The number of approvals since May 2010 has been 31 – under 15 per year – of which about 5 have been in London.⁴ DfE policy is now that sales are approved ‘only if the school has closed, has merged, or if equal or better facilities are being put in their place’, though discretion is with ministers and in some recent cases (not in London) it is reported that ministers have approved sales despite recommendations to the contrary from officials.⁵ Some specific disposals have been controversial, including some in London.
- 6.3 Other media reports have focused on a recent relaxation of rules on school buildings and premises, which has removed a requirement that secondary schools must have a certain area (depending on pupil numbers) of fields for outdoor team games, and replaced it with a less specific requirement that schools should have suitable outdoor space for PE lessons and for informal play. Some stakeholders such as the Sport and Recreation Alliance have expressed concern that the rule change threatens existing playing fields and the sporting opportunities of school students. However, the Government maintains that ‘extremely strict rules on playing fields will stay firmly in place’, and says that the rules changes will make it easier and cheaper to provide much-needed school places. There is to be a consultation later in the year on how the new rules are to be implemented, and it seems that the full implications may not be clear until after the consultation.⁶

7 Mayoral response

- 7.1 Following recommendations in the 2006 Environment Committee rapporteurship, the Mayor, in the 2011 revision of the London Plan, added specific mention of playing fields as a type of sports and recreation facility to be protected from development. The same revision also encouraged boroughs to assess sports facility need at the sub-regional level, in line with another recommendation of the rapporteurship.⁷

⁴ *Revealed: the 30 school playing fields sold off by the Coalition* Telegraph online, 16 August 2012 <http://www.telegraph.co.uk/education/keep-the-flame-alive/9480951/Keep-The-Flame-Alive-School-playing-fields-at-risk-as-ministers-relax-building-rules.html> and *Ten days after Olympics close, school's playing fields are sold in 'crime against children'* London Evening Standard, 22 August 2012 <http://www.standard.co.uk/news/education/ten-days-after-olympics-close-schools-playing-fields-are-sold-in-crime-against-children-8072433.html>

⁵ *School playing fields: Government apology for wrong data* BBC News online, 17 August 2012 <http://www.bbc.co.uk/news/uk-19291911>

⁶ *New rules on school playing space criticised* BBC News online, 15 August 2012 <http://www.bbc.co.uk/news/uk-19263693> and *School sports fields in danger as government relaxes rules* Guardian online, 14 August 2012 <http://www.guardian.co.uk/education/2012/aug/14/school-sports-fields-government-olympics>

⁷ *London Plan; spatial development strategy for Greater London* Mayor of London, 2011, policy 3.19 on page 109 <http://www.london.gov.uk/sites/default/files/LP2011%20Chapter%203.pdf> – compare the February 2008 version, policies 3D.6 on page 171 and 3D.12 on page 181 <http://www.london.gov.uk/thelondonplan/docs/londonplan08.pdf>

- 7.2 The Mayor has also recently commented on the school playing fields debate, stressing the importance of protecting playing fields and the safeguards that exist in London.⁸

8 Legal Implications

- 8.1 The Committee has the power to do what is recommended in the report.

9 Financial Implications

- 9.1 There are no financial implications arising from this report.

List of appendices to this report:

Appendix 1: Sport England Report – London Assembly Environment Committee: Playing Fields in London

Local Government (Access to Information) Act 1985	
List of Background Papers: There are none	
Contact Officer:	Ian Williamson, Scrutiny Manager
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E-mail:	ian.williamson@london.gov.uk

⁸ *London Mayor Boris Johnson calls for protection of school playing fields* Evening Standard online, 17 August 2012
<http://www.standard.co.uk/news/mayor/london-mayor-boris-johnson-calls-for-protection-of-school-playing-fields-8056933.html>

London Assembly Environment Committee: Playing Fields in London

Introduction

The following report provides an overview of Playing Fields in London for a three year period between 2010 and 2012, in terms of sites and pitches. The report is based on data held within Sport England's Active Places database, and is taken from the same "cut" of data that is used for the preparation of Sport England's internal *State of the Nation* facility reports . Also included within the report is an overview of Artificial Grass Pitches for the same time period.

It is not possible to go back and provide accurate, comparable data for the 2007 to 2009 period for the following reasons:

- The initial State of the Nation snapshot data was taken in May 2007 and July 2008, which does not allow for accurate time series data to be compared;
- The data "snapshots" of the whole database, were not retained prior to 2010, which means that the total number of sites below the regional level can be calculated;
- A second major clean-up of grass pitch data was started in 2008 following the appointment of The Leisure Database Company, which has resulted in further de-duping, which again leads to volatility in the number of sites added/changed (see below);

Overview 2010-12

Table 1: Overall Pitch Count by Borough 2010 -2012

Name London Borough	Jan 2010 Number of Pitches	Jan 2011 Number of Pitches	Jan 2012 Number of Pitches
Barking and Dagenham	157	136	134
Barnet	350	331	333
Bexley	210	199	201
Brent	125	130	131
Bromley	399	397	405
Camden	14	14	14
City of Westminster	48	49	49
Croydon	204	207	210
Ealing	215	193	197
Enfield	306	277	278
Greenwich	185	182	186

Name London Borough	Jan 2010 Number of Pitches	Jan 2011 Number of Pitches	Jan 2012 Number of Pitches
Hackney	104	95	98
Hammersmith and Fulham	31	36	38
Haringey	79	80	76
Harrow	224	217	226
Havering	168	184	184
Hillingdon	340	345	340
Hounslow	248	213	212
Islington	7	7	7
Kensington and Chelsea	4	5	5
Kingston upon Thames	139	141	149
Lambeth	43	26	26
Lewisham	101	98	95
Merton	129	135	131
Newham	60	60	60
Redbridge	271	257	263
Richmond upon Thames	255	261	262
Southwark	92	87	98
Sutton	132	136	131
Tower Hamlets	28	29	24
Waltham Forest	134	123	123
Wandsworth London	127	129	129
Total	4929	4779	4815

Notes (Tables 1 & 2)

Data is based on marked out grass pitches taken from Active Places in January 2010, 2011 2012. The following is included/excluded in the data:

- All types of marked out grass pitches in England, including football, cricket, rugby union, rugby league, hockey, lacrosse, softball, rounders, baseball, Australian rules, Gaelic football, American football, polo, shinty, hurling & cycle polo.
- Junior pitches are also included for football and rugby. Mini soccer pitches are not included in this report.
- Grass pitches that are open for use, by the public, this includes, pay and play, membership, club use and sports club / community association.
- Pitches that are for private use only are also included within this report, e.g. school pitches that are not open for community use are classed as 'private'.
- All operational grass pitches are included within this analysis, including those under construction and temporarily closed. Grass pitch sites that are planned and permanently closed are excluded from these figures.
- These figures do not include all Primary school sites.
- Artificial turf pitches and multi-use games areas are not included in these figures.



- Due to grass pitches being marked out seasonally, pitches may over lay each other on the same site, for example, a cricket out field may be marked out with football or rugby pitches during the winter.

Table 2: Site Count Summary 2010-2012 for London

Jan 2010 Site Count	Jan 2011 Site Count	Jan 2012 Site Count
1225	1213	1232

Explanation of Change 2010-2012

In seeking to compare data between the years it is important to note the following:

- The rolling nature of the audit. Facility closures are not always identified within the calendar year of reporting or immediately after. A clearer picture emerges a full audit cycle after the year of reporting. This, coupled with revised details for facilities, may result in year totals changing from year to year. This can be similar for Grass Pitch openings (year built). It also has an impact on the number of grass pitches (see below).
- That the marking out of grass pitches does vary year on year. This is dependent on a number of factors, including demand, wear and tear and budget.
- Data maintenance. This includes ongoing de-duping, site name changes etc. which can have an impact on the overall figures (see below). As data collection relies on feedback from providers, there is always a degree of error.

In comparing the number of sites, it is not straightforward to assume that there have been 12 sites lost between 2010 and 2011 (Table 2). There were in fact 56 changes to the number of sites in 2010/11 period within the database. Table 3 provides a more detailed breakdown as to the reasons behind the changes in the site totals between the two datasets.

Again between 2011 and 2012 in comparing the number of sites, although 19 sites have been added to the database between 2010 and 2011 (Table 2), there were in fact 45 changes to the number of sites within that period (Table 3).

Table: 3 Breakdown of site changes between 2010/11 and 2011/12

	2010/11	2011/12
Explanation	Number	Number
Site renamed	8	7
Data Error	14	0

Does not meet AP criteria	2	3
Duplicate	7	0
Site Relocated	3	1
Under Threat	22	3
Missing Facilities that were picked up	0	30
Temporarily closed pitch	0	1
New Pitch	0	1
Total	56	45

Notes (Table 3)

Site Renamed: These are sites which have been renamed in the database e.g. a school changes name when it becomes an Academy

Data Error: erroneous records coming into the Sport England copy of Active Places as containing grass pitches which have subsequently been found not flagged as containing any pitches in the suppliers copy, or vice versa;

Does not meet AP criteria: These are sites where it has subsequently been found that they do not meet the criteria as set out in the data model e.g. the site never had any marked out grass pitches

Duplicate: The site has subsequently been found to be the same as another existing site, often under another name e.g. Woodcroft Park in Barnet was the same site as Mill Hill Sports Club

Site Relocated: These are school sites where the school has closed and the site has either been sold onto another sports use or a new school.

Under Threat: Sites where pitches have now not been marked out for a number of years, or the site has closed.

Missing Facilities that were picked up: These are sites which have been operating but have previously never been picked up.

Temporarily Closed Pitch: Where the only pitch on the site has been closed for a temporary period e.g. school rebuild.

New Pitch: These are new pitches that have been created on a site which did not previously contain any pitches

From the above 22 sites in 2010/11 and three sites in 2011/12 have been identified which could be deemed potentially as under threat as the pitches have not been marked out for a period of time or the site on which the pitches were located has closed (see Table 4).

Table 4: Breakdown of Sites which are Potentially Under Threat by Borough

2010/11		2011/12	
Site Name	London Borough	Site Name	London Borough
BARNET HILL JUNIOR MIXED INFANT AND NURSERY SCHOOL	LB Barnet	HENDON FOOTBALL CLUB	LB Barnet
BIRCHMERE PARK	LB Bexley	HAYES & YEADING FC	LB Hillingdon
BEDONWELL JUNIOR SCHOOL	LB Bexley	POWERLEAGUE SOCCER CENTRE (NORBURY)	LB Merton
NORTHEND PRIMARY SCHOOL	LB Bexley		
TIVERTON PLAYING FIELD	LB Brent		
BASTON SCHOOL	LB Brent		
ENFIELD INVICTA CRICKET CLUB	LB Enfield		

MABLEY GREEN	LB Hackney		
HAVERING PLAYING FIELD	LB Havering		
RAINHAM RECREATION GROUND	LB Havering		
ELLIOT PLAYING FIELDS	LB Havering		
RIVERSIDE LANDS PLAYING FIELDS	LB Hounslow		
CARVILLE HALL PARK NORTH	LB Hounslow		
GROSVENOR PARK	LB Hounslow		
PEPYS PARK	LB Lewisham		
LADYWELL PARK	LB Lewisham		
WOODBIDGE HIGH SCHOOL	LB Redbridge		
KITCHENER ROAD PARK	LB Waltham Forest		
HIGHAMS PARK SCHOOL	LB Waltham Forest		
MARSH LANE PLAYING FIELDS*	LB Waltham Forest		
TINE ACRE PLAYING FIELDS	LB Waltham Forest		
HEATHBROOK PARK	LB Wandsworth		

Notes (Table 4)

The above table represents sites which may be under threat as they are currently not marked out. It does not necessarily mean that there are planning applications pending for the redevelopment or that they have been allocated for other uses in a local plan.

The above table has not been cross checked with the individual Boroughs or site owners since the update has taken place.

*Marsh Lane Playing Fields have subsequently been scheduled to be re-instated and upgraded as part of a compensation package agreed between Sport England, ODA and LB Waltham Forest in connection with the re-instatement of Drapers Field after the Games

Artificial Grass Pitches (AGP)

The figures for AGPs show that there has been an increase in the number of AGPs between 2010 and 2012 within London (Table 5). In addition there has been an increase in 3G type pitches. Some of these have replaced existing sand based pitches as the surface has come up for replacement (Table 7).

Table 5: Overall number of Artificial Grass Pitches by Borough 2010- 2012

Name of London Borough	Number of AGP's Jan 2010	Number of AGP's Jan 2011	Number of AGP's Jan 2012
Barking and Dagenham	3	5	4
Barnet	8	9	11
Bexley	7	6	6
Brent	5	7	8
Bromley	11	12	13
Camden	1	1	1
City of Westminster	2	2	3
Croydon	8	9	9
Ealing	6	6	6
Enfield	10	10	10
Greenwich	10	10	11
Hackney	2	3	3
Hammersmith and Fulham	5	6	6
Haringey	9	9	9
Harrow	6	5	6
Havering	7	7	8
Hillingdon	12	12	15
Hounslow	9	9	9
Islington	3	4	4
Kensington and Chelsea	1	2	3
Kingston upon Thames	2	2	2
Lambeth	2	2	3
Lewisham	6	6	6
Merton	9	9	9
Newham	3	4	4
Redbridge	6	6	7
Richmond upon Thames	5	6	6
Southwark	8	8	8
Sutton	2	2	3
Tower Hamlets	4	4	3
Waltham Forest	6	6	8
Wandsworth	4	5	6
Total	182	194	210

Notes (Tables 5, 6, 7)

- Contains all outdoor synthetic pitches in London which are a minimum 75mx45m and are of an artificial grass surface. Does not include other non turf type surfaces such as tarmac, concrete and redgra;
- All pitches that are open for use, by the public, this includes, membership, club use and sports club / community association;
- Pitches that are open for private use only are also included within this report, e.g. a school pitches that is not open to the public for general use;
- All operational pitches are included within this analysis, including planned, under construction and temporarily closed. Pitches that are permanently closed are excluded.



Table 6: Total number of Sites containing AGPs by Year

Jan 2010 Site Count AGP's	Jan 2011 Site Count AGP's	Jan 2012 Site Count AGP's
164	175	190

Table 7: Breakdown of surface type of AGPs by Year

Year	Rubber crumb pile (3G)	Sand Based	Water Based	Surface type not known	Total
2010	38	138	5	1	182
2011	45	141	4	4	194
2012	58	141	5	6	210

Sport England
February 2012

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Subject: Briefing on the Government's Draft Aviation Policy Framework

Report to: Health and Environment Committee

Report of: Executive Director of Secretariat

Date: 12 September 2012

This report will be considered in public

1 Summary

- 1.1 This report sets out an approach for a Committee discussion with key stakeholders on the Government's draft Aviation Policy Framework on 16 October 2012. The discussion along with previous Assembly work on aviation will enable the Committee to respond to the Government's consultation on the draft Aviation Policy framework and could contribute to a response to the forthcoming consultation on the proposed changes to managing night time flights at the Heathrow, Gatwick and Stansted airports.

2 Recommendations

- 2.1 **That the Committee agree the suggested guests and approach to the discussion on the Government's draft Aviation Framework, focusing on noise and climate change impacts.**
- 2.2 **That the Committee agree to submit a response to the Government consultation on the draft Aviation Policy Framework.**
- 2.3 **That the Committee consider whether further discussion is required before submitting a response to the Government consultation on night time flights due to be launched in the Autumn.**

3 Background

The draft Aviation Policy Framework

- 3.1 The Government launched a public consultation on its' draft Aviation Policy Framework (APF) on 12 July 2012. The APF sets out its policy approaches on addressing climate change, noise and air quality impacts from aviation, and the Government is seeking written submissions on them until 31 October. A final version of APF is due to be published in spring 2013.
- 3.2 The Government's policy approach on climate change is predicated on its objective to ensure that the aviation sector makes a significant and cost effective contribution towards reducing global emissions.¹ It is committed to making progress on a global emissions deal and more ambitious

¹ Paragraph 1.14, Draft Aviation Policy Framework, Department for Transport, July 2012

<http://www.dft.gov.uk/consultations/dft-2012-35/>

City Hall, The Queen's Walk, London SE1 2AA

Enquiries: 020 7983 4100 minicom: 020 7983 4458 www.london.gov.uk

technology standards through the International Civil Aviation Organisation,² and to working with European Union partners to ensure the success of the inclusion of aviation in the EU Emissions Trading System.³

- 3.3 The APF focuses mainly on local noise impacts and to a lesser degree on the effects on local air quality. Its overall objective is to aim to limit and where possible reduce the number of people in the UK significantly affected by aircraft noise. The Government is seeking to incentivise noise reduction and mitigation and encourage better engagement between airports and local communities and greater transparency to facilitate an informed debate. In particular, it wishes to see independent and transparent monitoring and enforcement, realistic noise limits linked to penalties which incentivise noise reduction and reflect the severity of noise disturbance and effective use of non-regulatory instruments such as differential landing fees.⁴

Night time flights at Heathrow, Stansted and Gatwick

- 3.4 It was anticipated that a Government consultation on the arrangements for managing night time flights at Heathrow, Stansted and Gatwick airports would run concurrent to the one on the APF, but the Government announced in July it has now been deferred to the Autumn. The current arrangements for managing night time flights were set in 2006 and are due to expire in October 2012. But in March 2012, the Government extended the arrangements by two years, pending a public consultation exercise on how night flights should be managed in the future.
- 3.5 The consultation will look at the effectiveness of the current arrangements and include a review of the costs and benefits of night flights, including an expert assessment of current literature on aviation night noise health impacts. It will also consider the 2011 night noise contours required under the European Environmental Noise Directive and will seek detailed evidence on the effectiveness of the current regime and on airlines' fleet replacement plans. A second phase of consultation on the proposed future restrictions will occur in summer 2013. The new arrangements will be announced in March/April 2014 and take effect from October 2014.

Environmental impacts – previous committee work

- 3.6 The former Environment Committee (EC) has built up a considerable body of work on the environmental impacts of aviation, and particularly on the effects on local air quality and noise, and the wider impacts on climate change. Discussions have focused on the effects of operations at London Heathrow and London City airports. The EC published reports in January 2010: *Flights of Fancy* and March 2012: *Plane Speaking*, calling for, inter alia, clarity on how European standards on air quality will be met around Heathrow, standardising measurements for aircraft noise, and a co-ordinated approach to addressing the surface access challenges around Heathrow. The report published in March focused on air quality impacts.⁵
- 3.7 The Committee also looked briefly at the health impacts of night flights, calling on the Government to carry out a detailed health impact assessment.⁶ Historically, night flights at Heathrow have been justified on the basis of the economic benefit they bring to London and the UK, but the body of

² The ICAO is a specialised agency of the United Nations which regulates international civil aviation.

³ Paragraphs 1.15 and 1.16, Draft Aviation Policy Framework, Department for Transport, July 2012

⁴ Paragraph 1.17, Draft Aviation Policy Framework, Department for Transport, July 2012

⁵ *Flights of Fancy: can an expanded Heathrow meet its environmental targets?* January 2010; *Plane Speaking: air and noise pollution around a growing Heathrow Airport*, March 2012 <http://www.london.gov.uk/who-runs-london/the-london-assembly/publications>

⁶ *Plane Speaking: Air and noise pollution around a growing Heathrow airport* <http://www.london.gov.uk/publication/tackling-air-and-noise-pollution-around-heathrow> The Committee recommended that the forthcoming Government consultation include a comprehensive review of the latest evidence on the adverse health impacts of night aircraft noise; and that it should include evidence of productivity losses associated with disturbed sleep, and set alongside an objective analysis of the economic value of night flights.

evidence on the effects of nocturnal aircraft noise exposure (such as hypertension, sleep disturbance, and noise annoyance) has grown considerably over the last decade.⁷

4 Issues for Consideration

Focus for the discussion

4.1 Members have indicated a desire to respond to the Government consultation on the draft APF and also to the forthcoming consultation on night time flights. It is suggested that the Committee use the 16 October meeting to revisit and update previous work on the impacts of aviation on local noise levels and on climate change.

4.2 The focus of the discussion will be on managing existing and future aircraft movements in the best way to minimise environmental damage and protect public health. Discussions could explore:

Climate change

- The likely effectiveness of EU Emissions Trading Scheme (ETS) as a global tool to reduce carbon emissions: The predecessor Environment Committee (EC) remained unconvinced that prolonged use of the ETS will have a significant effect.⁸
- Progress on developing agreement from the international aviation industry tackling aviation emissions
- Progress on technological advances in the aircraft industry: The EC was informed that trends in improvements in aircraft technology was relatively slow when compared to other industries.
- The current approach to reducing carbon emissions and how aviation emissions target will be met as capacity increases: The EC called for a phased approach with short, medium and long term milestones to help set an agenda for developing a realistic approach to reducing emissions

Aircraft noise

- The limitations of current methods to measure aircraft noise levels in UK, and the need for harmonisation with the EU approach as recommended by the EC.
- Approaches to noise mapping, the scope for developing joint contours and London-wide thresholds for noise mitigation and compensation schemes. The EC called for a strategic approach to noise mapping across London.
- The health impacts of aviation noise.

Night time flights

- In general terms, issues that might arise from the scope of the consultation on night time flight arrangements at Heathrow, Stansted and Gatwick as set out in paragraph 3.5. If the consultation document is published prior to the 16 October there may be scope for more focused discussion.

⁷ Page vii, *The Effect of Nocturnal Aircraft Noise on Health: a review of recent evidence*, Barts & the London School of Medicine, Queen Mary, University of London: report commissioned by the London Borough of Hounslow, September 2011.

⁸ Page 32, *Plane Speaking*, January 2012 <http://www.london.gov.uk/who-runs-london/the-london-assembly/publications>

Guests

4.3 The Committee could invite a range of experts to participate in the discussions and respond to Members' questions, including:

- A representative from the Committee on Climate Change
- A representative from NATS (National Air Traffic Services)/Civil Aviation Authority
- An noise expert
- John Stewart – Chair, HACAN (campaign group)
- Borough representation, for eg London Councils

4.4 The Committee is recommended to consider and agree the suggested guests and approach to the discussion outlined in paragraphs 4.1 and 4.3 above.

Consultation responses

4.5 The Committee's response to the Government's consultation on the draft Aviation Policy Framework would also draw on previous work by the predecessor Environment Committee.⁹

4.6 Members will need to consider whether to submit a Committee response to the consultation on night time flights drawing from previous work and the general discussion on 16 October, or whether further discussion will be needed at a later date.

5. Legal Implications

5.1 The Committee has the power to do what is recommended in the report.

6. Financial Implications

6.1 There are no financial implications arising from this report.

List of appendices to this report:

There are none.

Local Government (Access to Information) Act 1985
List of Background Papers: There are none.
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⁹ See the Committee's responses to the Government consultation on the proposed expansion of Heathrow airport and its published reports: Flights of Fancy, January 2010 and Plane Speaking, March 2012 <http://www.london.gov.uk/who-runs-london/the-london-assembly/publications/environment>

Subject: Proposal for a Rapporteur Review of Food Poverty in London

Report to: Health and Environment Committee

Report of: Executive Director of Secretariat

Date: 12 September 2012

This report will be considered in public

1. Summary

- 1.1 This report sets out the scope and terms of reference for a proposed rapporteur review of Food Poverty in London.

2. Recommendation

- 2.1 **That the Committee agrees to recommend to the GLA Oversight Committee the appointment of Fiona Twycross AM as a rapporteur to carry out a review of Food Poverty in London with the terms of reference outlined at paragraph 4.1.**

3. Background

- 3.1 The Department of Health has defined food poverty as *“the inability to afford, or to have access to, food to make up a healthy diet.”*
- 3.2 Under this definition the drivers of food poverty are low incomes and high and rising food prices. The economic recession has seen real household incomes fall; they are now at their lowest level since the second quarter of 2005, while the cost of food has continued to rise – food price inflation has outstripped general inflation for a decade – and the outlook is for further volatility in prices.
- 3.3 Being in food poverty, and therefore not eating a healthy diet, can have serious health consequences. Either through malnutrition or through the excessive consumption of salt, sugar and fat, poor diet is linked to diabetes, heart disease, cancer, dental caries in children, falls and fractures among older people, low birthweight, childhood morbidity and mortality; it is also linked to anti-social behaviour.
- 3.4 Responses to food poverty fall into two broad categories: emergency support for people already in food poverty, and broader measures to address the risk factors for food poverty. The investigation will look at both short-term and long-term responses to food poverty.

4. Issues for Consideration

- 4.1 It is proposed that the Committee agrees to recommend to the GLA Oversight Committee the appointment of Fiona Twycross AM as a rapporteur to carry out a review of Food Poverty in London with the following terms of reference:
- To investigate the scale and causes of food poverty in London;
 - To consider what the Mayor and partners can do to support people suffering food poverty in London; and
 - To consider what the Mayor and partners can do to address the risk factors of food poverty.
- 4.2 A paper containing background to the issues to be reviewed, focus, terms of reference and key questions to be answered by the review is attached to this report as **Appendix 1**.

5. Legal Implications

- 5.1 The Committee has the power to do what is recommended in the report.

6. Financial Implications

- 6.1 There are no financial implications arising from this review.

List of appendices to this report:

Appendix 1: Proposed review of Food Poverty in London

Local Government (Access to Information) Act 1985	
List of Background Papers: There are none	
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Food poverty in London

Fiona Twycross AM is leading an investigation into food poverty on behalf of the London Assembly's Health and Environment Committee.¹ The terms of reference are:

- To investigate the scale and causes of food poverty in London.
- To consider what the Mayor and partners can do to support people suffering food poverty in London.
- To consider what the Mayor and partners can do to address the risk factors of food poverty.

This paper provides information on the questions we are seeking to address and details of how you can contribute.

What is food poverty?

The Department of Health has defined food poverty as *"the inability to afford, or to have access to, food to make up a healthy diet."*²

Under this definition the drivers of food poverty are low incomes and high and rising food prices. The economic recession has seen real household incomes fall, they are now at their lowest level since the second quarter of 2005, while the cost of food has continued to rise – food price inflation has outstripped general inflation for a decade³ – and the outlook is for further volatility in prices.⁴

¹ www.london.gov.uk/moderngov/mgCommitteeDetails.aspx?ID=256

² *Choosing a better diet: a food and health action plan*, Department of Health, 2005

³ *Explaining UK Food Price Inflation*, J Davidson et al, Transfop, 2011

⁴ <http://www.fao.org/news/story/en/item/150904/icode/>

The Department of Health definition also incorporates other non-financial barriers to a healthy diet, which include a lack of awareness of what constitutes a healthy diet, not having the skills to prepare healthy food, or being unable to access sources of healthy food because of mobility problems or because it is not available locally.

Being in food poverty, and therefore not eating a healthy diet, can have serious health consequences. Either through malnutrition or through the excessive consumption of salt, sugar and fat, poor diet is linked to diabetes, heart disease, cancer, dental caries in children, falls and fractures among older people, low birthweight, childhood morbidity and mortality; it is also linked to anti-social behaviour.⁵

Key questions:

What are the major risk factors for food poverty?

What evidence is available about the health impact of food poverty?

Who is in food poverty?

The breadth of the definition of food poverty makes it difficult to establish precise data on the number of Londoners in food poverty. There are indications that Londoners are making greater use of emergency support:

⁵ *Food Poverty and health*, Faculty of Public Health, 2005

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Food poverty in London

the charity Trussell Trust, has reported that almost 15,000 Londoners were fed by its foodbanks in 2011/12.⁶

Research among children attending three Kids Company (a charity working with vulnerable young people) centres in London found that 37 per cent of 5-12 year olds said there was not enough food for them to eat at home every day.

Another indication of food poverty is the registration for free school meals. School Food Trust data shows about 30 per cent of schoolchildren in London were registered for free school meals in 2011/12, up from about 26 per cent in 2009/10.⁷ Other children may also be entitled but unregistered for free meals, while some children may experience food poverty without meeting eligibility criteria.

Key questions:

How can we determine the number of Londoners that are in food poverty?

Responses to food poverty

Responses to food poverty fall into two, broad categories: emergency support for people already in food poverty, and broader measures to address the risk factors for food poverty. This investigation will look at both short-term and long-term responses to food poverty.

⁶ Figure provided by Trussell Trust, July 2012

⁷ *Annual survey of take up of school lunches in England*, School Food Trust, July 2012; November 2009

Foodbanks

The Trussell Trust runs a network of 34 foodbanks in London, with the first established in 2009/10. Food is donated by the public or by retailers. The foodbanks are designed to be for those in temporary need, for instance because of losing a job or benefit delays. People are referred from GPs and other services, and can receive a maximum of 27 days' food over a year.

The London Food Board (LFB) and the London Waste and Recycling Board (LWRB) – both appointed by the Mayor – have been working to increase the amount of surplus food donated by the food industry. The LFB recruits major companies to agree to donate surplus food, while the LWRB has funded a depot for FareShare, a charity distributing surplus food.⁸

Lambeth Council is set to provide financial support to Norwood and Brixton foodbanks to boost their capacity. There is however expressed concern as to whether foodbanks are a sustainable response to food poverty.⁹

Key questions:

Does London need more foodbanks, and if so how can we increase the available resources?

Are foodbanks a sustainable response to food poverty?

⁸ http://www.fareshare.org.uk/?page_id=722

⁹ <http://www.guardian.co.uk/society/2012/aug/21/food-banks-lambeth-council>

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Food poverty in London

School meals

Government efforts to address food poverty have focused on school meals. However, take-up of free school meal provision among registered children is only about 75 per cent in London.¹⁰ Research has suggested that fear of stigma and food quality affect take-up levels.¹¹ Some London boroughs have introduced universal free school meal provision.

A recent survey of teachers found 78 per cent want schools to also provide free breakfast, with widespread reporting of pupils coming to school hungry.¹² A number of schools provide breakfasts to pupils already; the Mayor's Fund is also considering proposals to fund free breakfasts in a number of London schools through the charity Magic Breakfast.

Key questions:

*How does food poverty affect London schoolchildren?
Should all schools be providing breakfasts, and if so how can this be delivered?*

What else can schools do to ensure children have access to healthy food?

¹⁰ *Seventh annual survey of take up of school lunches in England*, School Food Trust, July 2012

¹¹ *Improving the take-up of free school meals*, Institute of Education, 2001

¹² 'Half of teachers say they bring in food for poor pupils', *The Guardian*, 20 June 2012

Food deserts

A 'food desert' is an area where there is limited local availability of healthy food. For instance, a recent food mapping exercise in Newham found that in some areas there was much easier access to cheap alcohol and fast food takeaways than to fresh fruit and vegetables.

In New York, Mayor Bloomberg has taken proactive steps to address food deserts, for instance using planning policy to require grocery stores in new developments, working with retailers to improve displays, and encouraging farmers' markets in deprived areas.¹³ In London, the Mayor has recently announced a pilot programme to increase the availability of healthy food in Tower Hamlets.¹⁴

Key questions:

Does London have food deserts, and what is the impact of these?

What initiatives exist to ensure affordable, healthy food is available in every part of London?

Skills and information

Food poverty may also be a consequence of lacking cooking skills; while literacy and numeracy skills are also important for understanding nutritional guidance and managing a household budget. To help people make

¹³ *A Tale of Two Obesities*, City University of New York & London Metropolitan Museum, 2010

¹⁴ <http://www.elc.nhs.uk/welcome/tower-hamlets-markets-to-receive-healthy-boost/>

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Food poverty in London

healthier food choices, information on food packages and in marketing may also needed to be clearer and more accurate.

Key questions:

What skills and information do people need to maintain a healthy diet?

The Mayor's role

The Mayor has responsibilities in a number of areas that may help him to address food poverty in London: These include:

- The Mayor is chair of the London Health Improvement Board, which funds public health programmes.
- The Mayor appoints the London Food Board, bringing together experts in the field.
- The Mayor appoints the London Waste and Recycling Board, seeking to reduce the amount of food waste.
- The Mayor has strategic planning powers: he publishes the London Plan, the statutory spatial development strategy for the city.
- In education, the Mayor has established academy schools, and has recently led an Education Inquiry to consider what further role he can play in this area.
- The Mayor can also develop relationships with London businesses such as food retailers, as he has done to address other issues, such as public toilet provision.

Key questions:

How can the Mayor use his strategic powers to help address food poverty?

How to contribute to the investigation

Fiona Twycross AM is seeking to assess the extent of food poverty and identify solutions. The investigation will involve a number of steps:

- Reviewing the available evidence on food poverty.
- Inviting written submissions – we will be contacting stakeholders for their views in September.
- Meetings between Fiona Twycross and experts and stakeholders, which will take place in late 2012.
- Publishing findings from the investigation in early 2013.

We will make recommendations as appropriate to the Mayor and the London Health Improvement Board, and disseminate best practice to those organisations tasked with addressing food poverty.

Written submissions should aim to address the questions outlined above, and any other issues you consider it important for the investigation to cover. We are keen to hear from people in food poverty, charities, faith and community groups, food producers and retailers, health and education providers, London boroughs and others.

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Food poverty in London

Please send submissions to Richard Derecki, London Assembly, City Hall, The Queen's Walk, London SE1 2AA or by email to rderecki@london.gov.uk.¹⁵

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¹⁵ We will publish written submissions on our website unless they are marked as confidential or there is a legal reason for non-publication. We may be required to release a copy of your submission if a member of the public or the media request it under the Freedom of Information Act 2000, even if it has been marked as confidential.

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Subject: Domestic retrofit

Report to: Health and Environment Committee

Report of: Executive Director of Secretariat

Date: 12 September 2012

This report will be considered in public

1 Summary

- 1.1 This report proposes that the Committee's 8 November meeting receive an update on progress with the Mayor's domestic energy efficiency retrofit programme (RE:NEW) and discuss with key stakeholders steps to tackle the rising number of households facing fuel poverty.

2 Recommendations

- 2.1 **That the Committee agree to receive an update on the retrofit of energy efficiency measures in homes in London at its meeting on 8 November 2012.**

3 Background

RE:NEW and the Green Deal

- 3.1 The Mayor's RE:NEW programme promotes energy efficiency measures to existing homes. It was developed, based on models from elsewhere in the country, following Environment Committee recommendations.¹ Under RE:NEW, expert advisers visit homes area-by-area to offer simple energy efficiency measures like draught excluders, and refer on to providers of bigger measures like loft and cavity wall insulation. The visits are funded by the GLA and the larger measures have been funded under Government obligations on energy companies, with no cost to the householder.²
- 3.2 The Mayor's target, set out in the Climate Change Mitigation and Energy Strategy, is for 200,000 homes to have been retrofitted by the end of 2012.³ Current projections to December are for this target to be exceeded, with:⁴
- About 84,000 homes delivered within the RE:NEW scheme
 - About 21,000 homes delivered using the RE:NEW procurement framework but funded by other sources such as boroughs and energy companies
 - About 203,000 homes delivered outside the RE:NEW framework

¹ *Lagging behind; insulating homes in London* London Assembly Environment Committee, December 2008 <http://www.london.gov.uk/who-runs-london/the-london-assembly/publications/environment/lagging-behind-insulating-homes-london>

² Including schemes such as the Carbon Emissions Reduction Target (CERT) and the Community Energy Saving Programme (CESP). For more information see http://www.decc.gov.uk/en/content/cms/funding/funding_ops/funding_ops.aspx

³ Mayor's Climate Change Mitigation & Energy Strategy, pages 123, 127 <http://www.london.gov.uk/sites/default/files/Energy-future-oct11.pdf>

⁴ Answer to Mayoral Question 2194/2012 asked by Murad Qureshi AM on 4 July 2012 and clarification provided by officers in GLA Environment team to London Assembly Secretariat on 30 July 2012
City Hall, The Queen's Walk, London SE1 2AA

- 3.3 There are also GLA retrofit programmes for workplaces, including RE:FIT,⁵ the Green 500 and the Green Business Partnership.⁶
- 3.4 From late 2012, the Government is introducing the Green Deal. Under the Green Deal, commercial providers will offer and/or co-ordinate a package of advice, fitting and finance. The finance will be a loan, with interest, repayable through the home's energy bill so that there is no up-front cost and potentially no bill increase. Alongside it, the Energy Company Obligation will require funding from energy companies to subsidise the Green Deal for hard-to-fit properties and low-income and vulnerable households and communities. This will replace existing energy company efficiency funding schemes.
- 3.5 There have been concerns about the effectiveness of the Green Deal and ECO for London's carbon reduction and other goals.⁷ During consultations on the Green Deal, the original market-led approach has been supplemented by scope for more community-based promotion, but there is still no regional ring-fencing or target for investment, leaving concerns that London will gain less than its share, as it has done under the previous national schemes.

Fuel poverty

- 3.6 Fuel poverty (defined as spending more than 10% of basic income on energy) in London is rising. National programmes to alleviate it have not delivered a fair proportion of investment for London. Energy efficiency is among the most important ways to tackle fuel poverty, and one of the main levers available to the Mayor. The Assembly has highlighted the need for future investment in RE:NEW to be better targeted at fuel poor households – supported through better use of mapping data on those at risk.⁸
- 3.7 There have been positive responses to this and other recommendations from the Assembly on fuel poverty, but there are still questions over the future of RE:NEW beyond 2012 and how hard-to-treat homes (of which there are many in London such as flats and properties with solid walls) will be tackled.

4 Proposal

- 4.1 The Committee can be briefed on current developments in domestic retrofit work, and talk with guests about how the challenges are being tackled. Challenges include:
- accelerating retrofit take-up when retrofit will no longer be free to the householder
 - how to ensure that targets are met for both carbon reductions and fuel poverty reduction
 - how to overcome the difficulties characteristic of London's mix of housing types and tenures
- 4.2 The following contributors could be approached as meeting invitees and/or contributors in writing.
- The GLA climate change mitigation and energy team;
 - The London Carbon Action Network (a body of borough officers involved in setting up a London Affordable Warmth and Health forum, following an Assembly recommendation)
 - Other borough contributors / London Councils
 - The Green Deal team at the Department for Energy and Climate Change;
 - Potentially other stakeholders such as energy companies or other funders or providers of energy efficiency retrofit work

⁵ <http://www.london.gov.uk/priorities/environment/climate-change/energy-efficiency/buildings-energy-efficiency-programme>

⁶ <http://www.london.gov.uk/priorities/environment/climate-change/energy-efficiency/business-energy-efficiency>

⁷ The Assembly's concerns are further set out in the Environment Committee report *Plugging the Energy Gap*, December 2011
<http://www.london.gov.uk/publication/plugging-gap>

⁸ *In from the cold*, London Assembly Health & Public Services Committee report on fuel poverty, March 2012
<http://www.london.gov.uk/publication/fuel-poverty-london>

5. Legal Implications

5.1 The Committee has the power to do what is recommended in the report.

6. Financial Implications

6.1 There are no financial implications arising from this report.

List of appendices to this report:

There are none.

Local Government (Access to Information) Act 1985
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List of Background Papers: There are none.
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Subject: Health and Environment Committee Work Programme

Report to: Health and Environment Committee

Report of: Executive Director of Secretariat

Date: 12 September 2012

This report will be considered in public

1. Summary

- 1.1 A report on the work programme appears on each Committee agenda, to note the Committee's work programme and agree any changes, including to confirm dates and add topics as required.
- 1.2 This report proposes that the topic for the 16 October meeting be the environmental and health impacts of night time flights at Heathrow, and that the topic for the 8 November meeting be domestic energy efficiency retrofit and fuel poverty.

2. Recommendation

- 2.1 **That the Committee agrees the following items for its future work programme:**
 - a. **The Government's draft Aviation Policy Framework consultation on 16 October**
 - b. **The Mayor's domestic retrofit programme and fuel poverty on 8 November**

4. Topics for forthcoming meetings

4.1 16 October meeting: The Government's draft Aviation Policy Framework

- a. The Government launched a public consultation on its draft Aviation Policy Framework on 12 July 2012. The Government is expected to consult on the night flights regime at Heathrow, Gatwick and Stansted Airports in the autumn.¹ The former Environment Committee has discussed in detail the environmental impacts of aviation on local air quality and noise levels and, and its wider impacts on climate change, focusing on the London Heathrow and London City airports. It published reports in January 2010 and March 2012, calling for, inter alia, clarity on how European standards on air quality will be met around Heathrow, standardising measurements for aircraft noise, and a co-ordinated approach to addressing the surface access challenges around Heathrow.²

¹ The current restrictions on night flying at these airports were set in 2006 and are due to expire in October 2012, but will be extended until October 2014, so that any proposed changes can also take account of the Government's Aviation Policy Framework due to be in place by next spring.

² Flights of Fancy: can an expanded Heathrow meet its environmental targets? January 2010; Plane Speaking: air and noise pollution around a growing Heathrow Airport, March 2012 <http://www.london.gov.uk/who-runs-london/the-london-assembly/publications>

- b. The Committee also looked briefly at the health impacts of night flights, calling on the Government to carry out a detailed health impact assessment.³ Historically, night flights at Heathrow have been justified on the basis of the economic benefit they bring to London and the UK (there are no night flights at London City airport). But over the last decade the body of evidence on the effects of nocturnal aircraft noise exposure (such as hypertension, sleep disturbance, and noise annoyance) has grown.⁴
- c. The Health and Environment Committee could build on this work to formally respond to both Government consultations. Specifically, the meeting on 16 October will examine issues expected to be covered in the consultation and provide material for a Committee response.

4.2 8 November: Domestic retrofit and fuel poverty

- a. The Mayor's RE:NEW programme promotes energy efficiency measures to existing homes, through area-by-area visits funded by the GLA, and insulation funded by Government obligations on energy companies. The Mayor is expecting to exceed the target of 200,000 homes fitted by the end of 2012.⁵
- b. From late 2012, the Government is introducing the Green Deal, which will have similarities to RE:NEW, but with payment by the householder via a loan paid through energy bills. Energy company funds will be targeted to hard-to-fit properties and low-income and vulnerable households and communities, via the Energy Company Obligation.
- c. Concerns about the effectiveness of the Green Deal and ECO for London's carbon reduction and other goals⁶ have been partly allayed by developments in the schemes during consultation. However, there is still no regional ring-fencing or target for investment, leaving concerns that London will gain less than its share, as it has done under the previous national schemes.
- d. Fuel poverty (defined as spending more than 10% of basic income on energy) in London is rising. National programmes to alleviate fuel poverty have not delivered a fair proportion of investment for London. Energy efficiency is among the most important ways to tackle fuel poverty, and one of the main levers available to the Mayor. The Assembly has highlighted the need for future investment in RE:NEW to be better targeted at fuel poor households, supported through better use of mapping data on those at risk.⁷
- e. There have been positive responses to this and other recommendations from the Assembly on fuel poverty, but there are still questions over whether RE:NEW will be funded beyond 2012 and how hard-to-treat homes (of which there are many in London such as flats and properties with solid walls) will be tackled.

5. Legal Implications

5.1 The Committee has the power to do what is recommended in the report.

³ Plane Speaking: Air and noise pollution around a growing Heathrow airport <http://www.london.gov.uk/publication/tackling-air-and-noise-pollution-around-heathrow> The Committee recommended that the forthcoming Government consultation include a comprehensive review of the latest evidence on the adverse health impacts of night aircraft noise; and that it should include evidence of productivity losses associated with disturbed sleep, and set alongside an objective analysis of the economic value of night flights.

⁴ Page vii, The Effect of Nocturnal Aircraft Noise on Health: a review of recent evidence, Barts & the London School of Medicine, Queen Mary, University of London: report commissioned by the London Borough of Hounslow, September 2011.

⁵ Answer to Mayoral Question 2194/2012 asked by Murad Qureshi AM on 4 July 2012

⁶ The Assembly's concerns are further set out in the Environment Committee report *Plugging the Energy Gap*, December 2011 <http://www.london.gov.uk/publication/plugging-gap>

⁷ *In from the cold*, March 2012 <http://www.london.gov.uk/publication/fuel-poverty-london>

6. Financial Implications

6.1 There are no financial implications arising from this report.

List of appendices to this report:

There are none.

Local Government (Access to Information) Act 1985
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List of Background Papers: There are none

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