

**London Assembly Environment Committee – 7 December 2017****Transcript of Item 6 – Waste Management: Energy from Waste**

**Leonie Cooper AM (Chair):** That brings us very smoothly on to one of our two main topics today. We are going to start with the final part of our investigation into waste and recycling, and this meeting is going to be focusing mainly on energy from waste (EFW). Members have had a briefing from the officers on that which has covered that in detail.

I would now like to introduce our guests, and we are very grateful that you have been able to join us this afternoon. I am going to start with Dan Cooke, who is Head of Regulatory Affairs from Viridor. You are very welcome; thank you for coming. We also have Shlomo Downen, who is the National Co-ordinator of the United Kingdom Without Incineration Network (UKWIN). Thank you also for being here. Andy Richmond, who is here very frequently, from the Greater London Authority (GLA). Thank you very much for coming again, Andy. It is very helpful. Tim Rotheray, who is the Director for the Association for Decentralised Energy. Thank you for coming, Tim. We have Professor Darryl Newport, who in his day job is to be found at the University of East London (UEL), but he is also associated with the Institution for Civil Engineers (ICE), and so he is partially representing ICE as well as UEL. I have I have got that balance correctly there. Last but hopefully very much not least, we are also joined by Julian Walker, who is the Chief Operating Officer from Cory Riverside Energy. Thank you very much to all of you for coming.

The first question that I would like to start by putting to Andy, and then I will open that up to general debate, is: why do you think that there has been an increase in burning waste for energy in London?

**Andy Richmond (Policy and Programmes Manager, GLA):** Certainly. Thank you very much. Thank you for inviting me again. Predominantly, the majority of the increase that we have been experiencing in London has been down to the London Plan policies to manage more of London's waste within London. Since the London Plan was first written [in 2004] there has been a 100% net self-sufficiency policy within that plan, and the purpose of that was for London to recognise the economic opportunity that the resources present to it, but also to address a number of the issues that the then-regions had for London, sending waste out to landfill outside of London and then subsequently the counties. This has been a continued challenge for London from the regions and the counties, that they are not prepared and they do not have the land and the capacity to continue to manage London's growing waste stream. More of London's waste over the last 15 years has been managed within London.

**Leonie Cooper AM (Chair):** That was a follow-up that I just wanted to ask you. When you were saying the London Plan, it was the initial iteration under the first mayor [Ken Livingstone, Former Mayor of London] that we are talking about that first brought forward the concept of self-sufficiency in terms of dealing with our own waste?

**Andy Richmond (Policy and Programmes Manager, GLA):** That is correct, yes, and then that is maintained throughout the iterations of the London Plan for that time period.

At the same time, we obviously put in high recycling targets within the first Strategy, followed through within the second Municipal Waste Management Strategy of the Mayor's, and the London Plan, which has gradually

seen recycling increase over that period. Certainly, until 2011 we saw a reasonable rate of increase in recycling in London, but also --

**Leonie Cooper AM (Chair):** Below everywhere else in the country.

**Andy Richmond (Policy and Programmes Manager, GLA):** Below everywhere else in the country, and there are reasons for that.

**Leonie Cooper AM (Chair):** It is to our shame, I think, that we are still behind.

**Andy Richmond (Policy and Programmes Manager, GLA):** There is a lot more we can do. It is not a level playing field. There is a lot more we can do. Over that period of time, with the Landfill Directive and Landfill Tax escalators increasing, local authorities were also looking for an opportunity to move waste away from landfill, whether that was inside London or outside of London, to alternatives. That has seen an increase in the number of EFW plants that have been proposed and been through planning within London, and that is the majority of the reason why we have seen that increase over that period of time.

**Leonie Cooper AM (Chair):** In terms of the current Mayor, having gone back through why we have got to where we are now, how would you characterise his position in terms of current and future use of EFW? Is that something that he wants to see a massive increase in, or steady state? Where are we?

**Andy Richmond (Policy and Programmes Manager, GLA):** On the modelling that we undertook for the Environment Strategy, I would just remind the Committee this is the first time we have looked at municipal waste as being household waste and waste similar to household waste that is arising from commercial and other organisations as one single quantity of material which we have to manage, and that is 7 million tonnes. The Mayor has now set a 65% recycling target for that waste stream by 2030, but that still leaves approximately 2 million tonnes of waste that would not be recycled and would, therefore, need to have some further treatment.

In terms of the existing and planned facilities - and when I say planned facilities I am really including the Beddington facility, which is actually in construction, and the replacement Edmonton facility - once those two facilities are online, we would have approximately 2.1 million tonnes of capacity within London, which we believe is sufficient to manage the material that would not be recycled. Notwithstanding there will be some material that would not be appropriate for that energy recovery facility, but if you take a binary view in terms of massive numbers, 65% recycling would mean there would be sufficient capacity to manage the non-recyclable waste.

**Leonie Cooper AM (Chair):** It sounds like a bit of overcapacity in there. Is that because you are expecting the trajectory towards the 65% to be particularly slow?

**Andy Richmond (Policy and Programmes Manager, GLA):** No. The London Plan and the Environment Strategy do not plan for any additional capacity. This is capacity that is already in the pipeline.

**Leonie Cooper AM (Chair):** I think Beddington, which I have visited as part of my preparation for this waste investigation, is going to come onstream in 2018. I am not quite so sure of the actual arrangements in terms of the enlargement improvement at Edmonton but that is going to be fairly soon. What I am wondering is how soon will we be heading towards the 65% recycling, which is a goal in 2030? In the meantime, it sounds as though by the time we get to the 65%, it will be overcapacity, as you are saying there will only be 2 million

tonnes that need a different mechanism other than being recycled. The 2.4 million will be overcapacity by then, but in the meantime, it will be about the right capacity, you think?

**Andy Richmond (Policy and Programmes Manager, GLA):** Yes. By the time we get to 2030, if we achieve the 65%, and just assuming a small growth in waste arising over that time period, factored in with population growth and economic growth, that does not necessary factor in the opportunities that could present to us around circular economy and further reduction in materials. Certainly, we are projecting that there will be by far enough capacity within London to deal with the non-recyclable waste.

**Leonie Cooper AM (Chair):** There no further plans for any further incinerators or EFW plants, other than those ones which we have that are working now and the two that are either expanding or being constructed. What can the Mayor do? How can he influence how much waste is being burnt across London to make sure that we head towards that 65% as quickly as possible?

**Andy Richmond (Policy and Programmes Manager, GLA):** In terms of London Plan policy, we have put in place policies that would require that any waste going to EFW would need to meet the carbon intensity floor (CIF). That means that it is predominantly non-recyclable waste, but also the provision of district heating networks, so very efficient plant, much more efficient than is required through the National Incineration Directives. Also, the approach that we are taking from now on when we are looking at the municipal waste in its entirety is to work much more closely with the waste collection operators operating in London to see how we can work together to maximise the amount of commercial waste that has also been collected for recycling and offset the need for EFW provision for the recyclable waste from the commercial waste sector.

**Shlomo Downen (National Co-ordinator, UKWIN):** It is very clear to me, looking at the latest statistics, that recycling is not keeping up with incineration in London. The gap now between recycling and incineration in relation to local authority collected [municipal] waste (LACMW) is 23.5 percentage points; that is, there is something in the region of 53.5% of LACMW that goes to incineration, and only about 30% that is recycled. It is clear to me that what this signifies is that recyclable and compostable material is being used as feedstock for incinerators, and obviously one way to create much more capacity for EFW in London is to limit what goes into incinerators to only genuinely residual waste, and then suddenly you will have twice as much capacity.

**Leonie Cooper AM (Chair):** That is exactly why we are talking about this today, to try to tease out exactly what is going in and what should be going in, and to make sure. That is why we also started at the waste hierarchy with the circular economy to try to make sure that we examine all elements of the chain, from the minute when waste leaves somebody's hand through to where it ends up at the end of that, and hopefully it is not a linear route.

**Julian Walker (Chief Operating Officer, Cory Riverside Energy):** As you may have seen, Cory submitted a planning application through the Planning Inspectorate (PINS) process for expanding our plant down at Belvedere. The justification behind this process is we have done a lot of research and used a number of independent consultants to gauge where the market will be in the future. We clearly are very supportive of recycling. We do a lot of recycling up in Smugglers [Way Household Waste Recycling Centre]. We do 75,000 tonnes per annum for them. The assessment we have done with independent consultants is that if the 65% is not achieved by 2018, there will be a capacity gap, taking into account the existing facilities and those that we have built, of between 600,000 and 1.4 million. My point is that it is very important that we understand that we should be readily to set up to deal with the opportunity or the possibility that the 65% will not be achieved.

What I would also like to just touch on is that in respect of the comment that EFW artificially suppresses recycling, we fundamentally disagree with that. Bexley is our home borough, and that borough has the highest recycling in London. It is in excess of 54%. In all of our LACU contracts, there are no minimum volume guarantees, and also the recycling rate or tariff gate fee is materially cheaper than the residual waste. It is to the benefit of the LACU to do more recycling.

The final point is important to remember as well, that our new development will have combined heat and power (CHP).

In answer to your original question and some of the points that have come up, it is important to note that companies like ours, operating in the sector, do provide recycling-led services to businesses as well as to local authorities. The moves that we have seen towards recycling rates and recovery rates, working in a complementary fashion, are driven by a good combination of the London Plan, which we have heard about, and an ambitious Environment Strategy, which sets a great framework, but also the economics and the policy effects at a United Kingdom (UK) level. Economics: we have the Landfill Tax, the driver away from landfill, and we all applaud that. We are all working very hard to deliver those recycling-led services, but we have to, as the point has just been made, provide good value-for-money services that are to the maximum benefit of the London economy. That is why there is the balance between more recycling, wherever that can be delivered in an economic way for our business and local authority partners, with recovery, in a complementary way, and finding the right levels that we can. 65% and 35% will be great if we can get there, but remember we have to make sure there are not huge volumes of material left sloshing around the London economy if we do not get there. I think it is a good combination.

There is a really good opportunity here for the contribution of energy recovery in London to make towards energy security, and the utilisation of heat and plugging into heat networks to make them more efficient as we get them up and running and operating. Again, it is important to reflect that the commercial and industrial collection services and recycling services we provide will contribute to the recycling performance of London going forward, and we are working hard to make sure we can deliver more recycling capacity at the same time as delivering the energy recovery capacity we are building.

**Leonie Cooper AM (Chair):** At this point I am going to move on to Assembly Member Russell, who is going to ask some questions about the environmental impacts of EFW. Assembly Member Gavron, we are going to come back to you in terms of the capacity issue, which is when you put your hand up, and we are going to talk about future capacity and you are going to ask a series of questions about that later.

**Nicky Gavron AM:** I just wondered if I could ask about beyond 2030, because the Mayor has --

**Leonie Cooper AM (Chair):** That is the future, so we will come back to that later. Your questions are about future capacity, so if you are going to go beyond 2030, that is definitely classed as in the future.

**Nicky Gavron AM:** Yes. It is just that the recycling targets beyond 2030 are not laid out beyond 65%, and I just wondered whether --

**Caroline Russell AM (Deputy Chair):** Looking at the environmental impact of EFW and noting that EFW is second from bottom in terms of the hierarchy if we are thinking about the environmental impacts of dealing with waste, my first question - and I will put this both to Darryl Newport and also to Dan Cooke - is just broadly, what are the environmental impacts of burning waste for energy?

**Professor Darryl Newport, University of East London and Institution of Civil Engineers**

**Representative:** I wonder if I could help out on this. I am not sure if my knowledge is that great, but I will see what I can do. In terms of the environmental issues from EFW, most of the local air pollution issues are dealt with by a number of scrubbing solutions. It has been found that particulate matter around facilities is very good. The major problem from EFW facilities is the scrubber that comes from the stack system, which is air pollution control residue (APCR). That is where most of your issues come from. Most of the gaseous material that comes out of the stack from this system is carbon dioxide, but - I might have to check with my colleagues here - in terms of the amounts that are coming out from the stack and the amounts that would come out from landfill, including methane and carbon dioxide, there is a net negative gain. It is a good situation to be in, but only just.

In terms of what you do with the material that comes out of the stack, that is the interesting thing. If you are looking at 2 million tonnes of material going in, at least 3.5% to 4% of that is APCR.

If you look at the 7 million tonnes of waste, and then 2 million going to EFW, 3.5% of that type of material would come back out as APCR, 4%. You are still looking at 300,000 to 400,000 tonnes of APCR waste that you have to currently put to landfill, and it is specialist landfill.

**Caroline Russell AM (Deputy Chair):** Sorry, could you say again what APCR is?

**Professor Darryl Newport, University of East London and Institution of Civil Engineers**

**Representative:** APCR is air pollution control residue, which is the material that you put into the stack --

**Caroline Russell AM (Deputy Chair):** That is particulates in the air?

**Professor Darryl Newport, University of East London and Institution of Civil Engineers**

**Representative:** No. That is what comes out of the stack where they are putting the gases through to clean the gases going through. It is very clean. The gas that comes out is very clean, but it is the APCR that then they take out which holds most of the --

**Julian Walker (Chief Operating Officer, Cory Riverside Energy):** I just wanted to make it clear. It does not come out through the stack. The cleaning process of the gases goes through a number of filtration bags. It has activated carbon added to it, which essentially captures the heavy metals and any nasties. The fine material that is left, the APCR, either goes to landfill or gets treated. There are two companies that we use, which have a number of processes for recycling that material. It is now that --

**Caroline Russell AM (Deputy Chair):** What sort of processes for recycling it? Does it go into roads?

**Julian Walker (Chief Operating Officer, Cory Riverside Energy):** It gets converted into breezeblocks, for example, and there are companies that do that. There have been problems with that in the past, and that has now been resolved. It does not all go into landfill.

**Nicky Gavron AM:** How much does go to landfill?

**Julian Walker (Chief Operating Officer, Cory Riverside Energy):** Out of our process - and I can only speak for ours, which is Belvedere - we treat 750,000 tonnes of London's waste, about 10,000 tonnes of APCR, of which 50% goes to landfill.

**Nicky Gavron AM:** 10,000 tonnes?

**Julian Walker (Chief Operating Officer, Cory Riverside Energy):** No. 50% of that, so 5,000 tonnes. That is a legacy issue because of the contract that we had to put in place as part of the planning process. We would prefer not to do that but we have a contract that we are obliged to stick to, and we tested it legally to see if we could extricate ourselves from that, and we cannot. The world has moved on considerably since we received our planning process, and there are now effective ways of doing it without sending it to landfill.

**Nicky Gavron AM:** What proportion is ash before you do all your --

**Julian Walker (Chief Operating Officer, Cory Riverside Energy):** Ash. Out of the 750,000 tonnes of waste that we treat, we produce about 200,000 tonnes of incinerator bottom ash (IBA). Of that IBA - and I need to be clear on this - about 20,000 tonnes is metal, and that is all recycled. The remainder is then used in the aggregates and construction market, thereby displacing 180,000 tonnes of quarry material that would need to be quarried in the UK. It is reusing or recycling or upcycling - however you want to look at it - the actual ash that comes out.

**Dan Cooke (Director of Regulatory Affairs, Viridor):** Going back to the original question, I would say, do not underestimate the big step up the waste hierarchy that the move from landfill for these hundreds of thousands of tonnes, indeed millions of tonnes of material across the UK, into energy recovery represents. That is a major environmental benefit in terms of overall carbon impact. It reduces the methane emissions that we are working hard to get away from, from landfilling that material, and losing it in terms of the economic benefit, the energy security, that it can supply.

However, many people look at EFW in its current technologies as part of the transition to a lower-carbon technology. It should also be recognised that about 64%, as far as I recall the latest Government figures being, of inputs into EFW is deemed as renewable material; it is biogenic material. The remainder of that is the fossil fuel material, which is the carbon that we have to work hard to move away from.

I know we will come back to futures, but as lots of drivers in the world of plastics, for example, move to produce more packaging from biopolymers, organic-made plastics and materials, that renewable input into the energy recovery infrastructure that we are delivering in London may well improve and, therefore, these become more reliant on renewable fuels, good renewable fuels, and generate good renewable energy.

In terms of environmental impact, we also have to remember that all of the facilities - and we operate a fleet of eight Energy Recovery Facilities across the UK at the moment, including Lakeside out near Heathrow, and Beddington is one of four that we are building and will bring online - operate under very effective regulations, standards and control. Indeed, the compliance records of the modern generation of energy recovery plants are impeccable. The high standards that have come down from Europe, that have been implemented by the UK Government and within London, are extremely effective in making sure that the emissions, some of which are the emissions we have talked about, and the emissions standards are very rigorous and very robust.

The last point I would make in terms of the output is that I would reiterate what we have already heard. The air pollution control systems that are within the plant: we inject ammonia into the combustion chamber to prevent the formation of oxides of nitrogen, potential air quality issues. We introduce activated lime and activated carbon to remove any other emissions. The lime and the carbon are caught in very effective filters, and those filters are knocked off, and that is what forms the APCR. We have contracts in place at all of our plants at the moment to make sure that all of that material will eventually be recycled. The recycling capacity

for that material in the UK is coming up to meet the capacity that we have built in terms of overall energy recovery, and it is effectively neutralised and turned into a perfectly serviceable and good-quality product that can be used in the construction industry. That is not just filler. That is breezeblocks for construction.

**Caroline Russell AM (Deputy Chair):** What about greenhouse gas emissions from burning all of this material?

**Dan Cooke (Director of Regulatory Affairs, Viridor):** Quickly, and without any figures in front of me, that is where we come to the transition technology that EFW represents. The main emissions that you see from a stack in any of the plants that operate both in London and the rest of the UK are carbon dioxide and water, with very small levels of some other trace compounds. Carbon dioxide is the material we have to move away from. Much of that comes from burning some of the low-grade plastics, the non-recyclable material that goes into those plants. However, it is still a marked improvement on putting that material into landfill and the methane that would result from that. It is that big step up the hierarchy. We are looking in terms of plant efficiency. The more heat utilisation we can deliver, for example, the more efficient these plants will become and, therefore, the carbon intensity of the plants will further reduce over time as we deliver them and then optimise them.

**Caroline Russell AM (Deputy Chair):** Do you think there is a risk, though, that if there is lots of incineration capacity, local authorities are less inclined to make the effort to recycle and reuse materials? Incineration should be the very last-ditch thing, and the way that the incineration plants are being talked about makes it sound quite easy to use them. Do you not think that there is a risk that people are going to think, "Recycling doesn't really matter; we will just burn it"?

**Dan Cooke (Director of Regulatory Affairs, Viridor):** I do not think so. I think the tide towards recycling will continue. We have done household recycling index surveys to ask people what they think good levels of recycling are and what they think about their recycling services. Time and time again, year in, year out, that demand for good-quality, convenient, easy-to-use and cost-effective recycling services continues to grow. I do not think we can turn back that tide, and I am very pleased about that. As a recycling company and one of the biggest in the UK, we are very pleased about that, but it is a challenge.

We know in London we have lower than average recycling levels achieved by local authorities, so this is where it is a mix of the economics and the very good and pragmatic targets set within the London Environment Strategy and UK-wide recycling targets that will continue to drive that to achieve that balance between higher levels of recycling that we have at the moment and complementary levels of recovery that we need to see.

**Tim Rotheray (Director, The Association for Decentralised Energy):** Your question is about if we have a lot of incineration facilities, does that mean that we will not bother recycling? There is some quite helpful evidence that you can see, particularly in Denmark and Sweden.

**Leonie Cooper AM (Chair):** I do not want to have to ask to clear the public gallery, but could I ask that people do not comment from the public gallery? This is a meeting where Assembly Members are questioning our guests. I did earlier on give you the information about how you can join in in terms of comments on Twitter, which will then be very public to the rest of the world who are not here, but it is really difficult for us if you talk over the guests because we cannot hear what they are saying. Thank you. Would you like to continue, Tim?

**Tim Rotheray (Director, The Association for Decentralised Energy):** Thank you. In Denmark, they have a commitment to make all of their energy fossil-free, and they already have a significant amount of energy recovery on their heat networks. In Denmark about 60% of homes and businesses are on heat networks. They recover the power and the heat from their energy recovery facilities. When I visited about three years ago, they were talking around about 65% to 75% biogenic materials, so food waste and other residues being combusted in those plants, and their intention or their plan is to deliver - and they are on track for it - carbon-free energy. They are managing to pull more and more of the fossil-derived plastics out of their waste streams and recycling more, and they tend to have higher recycling rates than we do, and yet they have these facilities at the hearts of their cities. It absolutely needs strong policies and it needs clear direction from National and Local Government, but it is not necessary that the existence of waste recovery facilities stops recycling. In fact, the opposite has been seen to be the case in those countries.

**Caroline Russell AM (Deputy Chair):** Thank you. Shlomo, you were indicating.

**Shlomo Downen (National Co-ordinator, UKWIN):** Yes, a few quick points. First of all, it is a bit confusing because EFW covers a lot of technologies. We are talking about incineration. I know the industry does not like to use the 'I' word. Let us differentiate from anaerobic digestion and other forms of EFW. We are talking about incineration. Not all incinerators are above landfill in the waste hierarchy. There is an R1 formula, and all incinerators that fall short of that threshold of 0.65 - which is not 65% thermal efficiency, but it is a calculation - generally speaking, when we are talking about municipal waste incinerators, are by default disposal facilities at the same level in the waste hierarchy as landfill.

The second point to make is that, as the Mayor's Environment Strategy notes, half of all London's food waste is going for incineration. In terms of environmental impacts, towards your question, that is absolutely outrageous. You heard a month ago that there is anaerobic digestion plant with capacity going spare. Clearly, that food waste should not be going --

**Leonie Cooper AM (Chair):** We were in that meeting.

**Shlomo Downen (National Co-ordinator, UKWIN):** Exactly, so you know. When it comes to environmental impact, part of the environmental impact is that incinerators are robbing composting and anaerobic digestion of their feedstock, which brings us on to the health argument very briefly. Incinerators damage air quality and damage soil quality, and they cause nuisance to the neighbours, so there are adverse environmental impacts there.

Finally, in relation to climate change, I note, having looked at Cory's carbon report [Cory Riverside Energy: A Carbon Case], that when you look at it more closely, it demonstrates that sending waste to Cory's Riverside incinerator results over a 30-year period in between 6.7 million and 10.5 million tonnes more CO<sub>2</sub> emitted than sending that same waste untreated to landfill. Obviously, if you compare it with recycling, the CO<sub>2</sub> emissions from the Riverside incinerator are even worse. Even if you just take a straight comparison between sending the waste untreated to landfill, even though there are many ways to pre-treat it to reduce the climate change impact, the Cory Riverside incinerator is a climate sinner, rather than a climate saint.

**Caroline Russell AM (Deputy Chair):** Thank you. One other environmental impact is obviously the road transport to get the materials to the incinerator plants. Does anyone want to comment on that?

**Dan Cooke (Director of Regulatory Affairs, Viridor):** At a high level, having self-sufficiency within London at the moment, if the infrastructure that is under construction and that we have already talked about is



delivered, combined with good recycling infrastructure within London as well, it will have a benefit. At the moment, quite a lot of London's waste has to go outside the boundaries of London to find the diminishing landfills for disposal. Therefore, if you have self-sufficiency for London, you are treating the material or utilising the material as close to its point of arising as possible. Minimising transport emissions, optimising logistics around waste management. Transport and logistics are some of our main costs in the sector. Therefore, there is always a drive to drive efficiencies and make that as efficient an operation as possible. Having self-sufficiency and treating the waste as close to its point of arising has to be of benefit and has to be the right way forward in the right direction.

**Caroline Russell AM (Deputy Chair):** The environment impact of waste to energy is going to depend on efficiency, the waste mix, the carbon intensity of other energy sources and other factors that can change over time. How can the Mayor and others anticipate these changes when they are planning the Waste Strategy, and how can operators be monitored and held accountable?

**Tim Rotheray (Director, The Association for Decentralised Energy):** You are absolutely right that the emissions associated with any plant burning any element of fossil fuels is going to become more significant as the rest of the power system decarbonises and then the heat system as well, whatever that might be: electricity, gas or heat. The key thing for a long-term decarbonisation of the power system is to enable those EFW plants to operate flexibly. If you have a day where there is lots of sun and lots of wind and they are dominating the power system, and there is no fossil plant at all on that system, then you do not want plant to be producing electricity. You have a period. At the same time, when you have an evening in winter and there is no solar and maybe it is not that windy, then those plant will be displacing higher carbon plant on the system. The flexibility of those plants is key.

One of the ways that you can do that, and a key driver in the carbon content, is making maximum use of the energy, so recovering the heat. When you recover that heat, one of the key enablers of flexibility is by storing it, by making big heat stores. We have in London several heat stores. The biggest one is probably the 2,500-tonne heat store at Pimlico. Those heat stores enable the generating plant to operate flexibly and generate their energy at times that disconnect their time of demand for energy on the network from the time at which it is generated. That is probably one of the key ways: recovering the heat and then operating those plant flexibly. That is a longer-term driver.

**Leonie Cooper AM (Chair):** You are talking about storage.

**Tim Rotheray (Director, The Association for Decentralised Energy):** Thermal storage, yes.

**Julian Walker (Chief Operating Officer, Cory Riverside Energy):** I have just one very quick point, and I just want to come back on the point made there. The Carbon Trust, which is obviously independent, did a report on our facility. Its conclusion was that we save approximately 200 kilograms of CO<sub>2</sub> compared to waste that is put into landfill. I just want to make sure that is understood.

**Shlomo Downen (National Co-ordinator, UKWIN):** Just as a point of order --

**Leonie Cooper AM (Chair):** I am sorry, we do not offer points of order. I am chairing the meeting and I will bring you in. I now have two Assembly Members showing as well as you, and I just remind you that we do have a number of other areas to cover. It really does not help if we keep interrupting each other.

**Julian Walker (Chief Operating Officer, Cory Riverside Energy):** I was just going to make the point in terms of technology. Depending on the type of technology that is used in EFW, whether it is gasification, pyrolysis or full incineration, one of the benefits of full-combustion incineration is that it can handle a broad calorific value (CV) of waste. Our plant, which is the one I know, can handle waste between 7 and 13 CV, so that gives it resilience as we go forward, and the expectation is that CV will probably drop because of the reduced amount of plastics, which we will support. Therefore, in terms of technology, it is important that that is taken into account as to the right technology, i.e. having that resilience to handle a broad CV of waste.

**Shaun Bailey AM:** Just a quick question on flexibility. Tim, you talked about flexibility, but does that work from a business point of view and a rubbish point of view? It seems to me that if we went this route and we made incineration a big part of our rubbish collection and disposal, it would very quickly overwhelm the flexibility that you are talking about. It does not seem realistic to me.

**Tim Rotheray (Director, The Association for Decentralised Energy):** There are plants out there which have the ability to take in waste and then operate their generation flexibly, but the point is that you are continuing to operate. If you have thermal store, you continue to operate the plant, and the energy is being put into the thermal store. You are not stopping the operation of the plant. What you are doing is you are storing it. For example, if you are generating during the day and the customers come home in the evening, they then turn the heating on and that heat is then delivered to those customers. The plant is still operating. You are not stopping the operating of the plant. You are enabling the flexibility of the energy use.

**Leonie Cooper AM (Chair):** We are poaching into Assembly Member McCartney's subsequent questions here, but I am now going to cut that discussion short and we will now come back to that.

**Nicky Gavron AM:** My understanding is that Belvedere, Beddington-to-be and Edmonton are all going to be taking a quite substantial amount of waste from a 50-mile radius, and that Belvedere and Beddington will take it from counties outside. Is this correct?

**Julian Walker (Chief Operating Officer, Cory Riverside Energy):** If I speak for Belvedere at the moment, as you probably see, we have barges going up and down the Thames collecting waste from the Western Riverside Waste Authority (WRWA), where we have waste transfer stations. That is Wandsworth and Battersea. Then we have a waste transfer station in Walbrook, across here. For our particular plant, 650,000 of the 750,000 tonnes come by the river.

**Nicky Gavron AM:** From London?

**Julian Walker (Chief Operating Officer, Cory Riverside Energy):** Yes, from the centre of London. We then have a waste transfer station in London Borough of Tower Hamlets (LBTH), and we receive by road from Bexley because obviously it does not make sense to bring it by the river.

**Nicky Gavron AM:** You do not bring in any commercial waste from outside London?

**Julian Walker (Chief Operating Officer, Cory Riverside Energy):** Outside the London area, no, we do not.

**Nicky Gavron AM:** You bring no waste in from outside London?

**Julian Walker (Chief Operating Officer, Cory Riverside Energy):** Not at the moment, no. None at all.

**Leonie Cooper AM (Chair):** In fact, do we not export waste out of London to the continent?

**Julian Walker (Chief Operating Officer, Cory Riverside Energy):** We do. We send 600,000 tonnes of London's waste to the continent, and I think it is an important point to make. Of the 750,000 tonnes of waste we treat, we generate 528 gigawatt hours of power, which is enough power for --

**Nicky Gavron AM:** How much?

**Julian Walker (Chief Operating Officer, Cory Riverside Energy):** 528 gigawatts, or enough power for 160,000 homes.

**Nicky Gavron AM:** Electricity?

**Julian Walker (Chief Operating Officer, Cory Riverside Energy):** Yes, exactly that.

**Nicky Gavron AM:** What about heat?

**Julian Walker (Chief Operating Officer, Cory Riverside Energy):** We have the ability to export heat, so we are a full CHP plant, but we do not have the land site infrastructure, i.e. the piping, going from the plant to --

**Nicky Gavron AM:** No heat. Thanks.

**Julian Walker (Chief Operating Officer, Cory Riverside Energy):** Not yet. Not yet.

**Nicky Gavron AM:** Can we just go on to Beddington?

**Leonie Cooper AM (Chair):** Nicky, we are --

**Nicky Gavron AM:** I wanted to ask about Beddington and how much they were taking from outside London.

**Leonie Cooper AM (Chair):** That would be Dan, then, because Viridor is building the Beddington plant.

**Dan Cooke (Director of Regulatory Affairs, Viridor):** I am happy to take that. At the moment, the plant is due to come online next year, so we are going into commissioning. Hopefully, the first burn will be before the end of this year. Our market analysis shows that the vast majority of the input or the biggest proportion will come from the South London Waste Partnership, which is four --

**Nicky Gavron AM:** 150,000 tonnes.

**Dan Cooke (Director of Regulatory Affairs, Viridor):** Yes, which is four London local authorities working together. The rest of the fuel for the inputs will come from the local market. The south London market, remember, is not just local authorities. It is business, commercial and industry material we are helping to recover energy from as well, so it is the local market.

The other thing to remember and the assurance that you have on that is, remember, Kent, Surrey, Sussex, the local authority areas surrounding that bit of south London, all have their own facilities and are all building in their own capacity. It is not likely - in fact, it is highly unlikely - we will be able to offer a service to local authorities locally. Remember the point I made about transport. One of the highest costs in waste management is transport, so the further away you bring material, the more expensive it becomes. We are building a facility for the local market.

The last thing I would mention is, likewise, heat. We have already signed an agreement with the Sutton Decentralised Energy Network (SDEN) to supply heat. We are about to plug in heat from the landfill gas --

**Nicky Gavron AM:** How many megawatts?

**Dan Cooke (Director of Regulatory Affairs, Viridor):** Of heat? I am not entirely sure. I would have to come back to you on that.

**Nicky Gavron AM:** Can you let us know?

**Dan Cooke (Director of Regulatory Affairs, Viridor):** To start with, it is a modest one because we have plugged in the landfill gas engines. As soon as we bring the energy recovery facility on, all of the heat output that we can supply we will supply via that agreement.

**Leonie Cooper AM (Chair):** Now we are going to move on to David's [Kurten] set of questions, Nicky, because you have now poached into another set of questions as well. We are leaping around through our briefing, and other members may now not necessarily feel that they want to cover all their questions. We are going to come on to the public health impacts of EFW, and David is going to ask Shlomo and Julian and possibly others. Did you want to come in as well, Darryl?

**Professor Darryl Newport, University of East London and Institution of Civil Engineers**

**Representative:** I just wanted to clarify something on the last question, if I may. If we are sending refuse-derived fuel (RDF) material to Europe, is that because their recycling programmes are much better now and, therefore, the businesses that are producing energy are requiring to import material in order for them to stay viable?

**Nicky Gavron AM:** They are importing.

**Leonie Cooper AM (Chair):** That is their problem, not ours, though.

**Professor Darryl Newport, University of East London and Institution of Civil Engineers**

**Representative:** No, I know, but I am just wondering whether or not, if that is the case in terms of capacity and we are developing capacity, we do not want to overdevelop capacity so we then find ourselves importing material in order to keep processing --

**Leonie Cooper AM (Chair):** No, absolutely, but that was why we were trying to explore that earlier on in the questions about whether we have sufficient capacity with Andy [Richmond], and talking about potential growth of population and the need for the additional capacity to meet that. At the moment, we also have stuff that we are exporting, which perhaps we do not have sufficient capacity for. Whether that is going to create an overcapacity elsewhere in Europe, I am afraid I am going to concentrate on London today, not even the rest of the UK, and I am certainly not taking on capacity issues or overcapacity in Denmark, the Netherlands or Germany.

**Professor Darryl Newport, University of East London and Institution of Civil Engineers**

**Representative:** The question was about London.

**Leonie Cooper AM (Chair):** That is slightly beyond our remit.

**David Kurten AM:** I would like to ask about the effects of incineration, of burning waste, on public health. If I could start with you, Shlomo, and just ask you quite simply, how does burning waste affect public health?

**Shlomo Downen (National Co-ordinator, UKWIN):** Straightforward. There is air quality. There is soil quality. Generally speaking, incinerators are nuisance neighbours, so there is noise, there is odour. All of this detracts from people's quality of life. There is widespread disappointment among UKWIN Members about the role of the Environment Agency (EA). As regulators, our understanding is that they do not have sufficient resources and they do not have a sufficiently robust remit. Maybe whatever comes to replace the EA may be a bit more vigorous, but certainly from the perspective of people living in the vicinity of incinerators, it causes distress. Just the prospect of an incinerator being built in someone's area can result in health impacts. The

actual reality of the incinerators themselves makes matters worse: shortening people's lifespans, making it more difficult for people to breathe, etc. It is pretty straightforward, really.

It is contentious to what extent incinerators pollute, etc, but I do not think anyone could reasonably argue that incinerators improve air and soil quality. We are just down to a matter of degrees to what extent it deteriorates. Particularly in London, if we narrow our scope to London as the Chair asked us to do, then there is a lot about London's air quality. Everyone, I imagine, agrees that we should be working in the direction of looking to improve London's air quality. Incinerators move us in the wrong direction.

**David Kurten AM:** You talk about air quality a lot, so that is to do with the emissions from the chimney and the incinerators. We have mentioned before that the main gases coming out are water and carbon dioxide, so they are not harmful to human health, but what are the emissions that are harmful to human health?

**Shlomo Downen (National Co-ordinator, UKWIN):** With respect, carbon dioxide is harmful. It is considered to be a harmful emission. It is a greenhouse gas and, therefore, exacerbating climate change, etc, but it is indirect in the way that you are talking about. First of all, there is the whole process of *de novo* synthesis, where there are dioxins which are not present in the waste but which are created by the burning process. Those dioxins are destroyed in high temperatures, but then as the air cools on the other side of the monitors, the other side of the stack, the other side of the filters, then they reform because the air is cooler. Having been destroyed, all the constituents are there next to each other, and they reform. There are all sorts of problems that relate - it is all the classic stuff - to dioxins and relate to furans. There are a whole host of chemicals that come out of incinerators that are not monitored, that are not measured. There are some that are spot-checked, but we know from studies that spot-checking can greatly underestimate --

**Leonie Cooper AM (Chair):** Can I just clarify?

**Shlomo Downen (National Co-ordinator, UKWIN):** Please, yes.

**Leonie Cooper AM (Chair):** You said, "Incinerators that are not checked and not spot-checked". Are there incinerators in London that you are aware of that have not been --

**Shlomo Downen (National Co-ordinator, UKWIN):** It is all incinerators, including all of the London incinerators.

**Leonie Cooper AM (Chair):** Are not checked?

**Shlomo Downen (National Co-ordinator, UKWIN):** I am not saying that they are not checked for anything, just to be very clear. There are some continuous monitoring processes, and apart from start-up and shutdown, they are not monitored or, even if they are monitored, they are allowed to exceed without the EA considering that to be an exceedance of the permit. Everything is laid out in the permits of the different incinerators, including a high degree of leeway when it comes to emissions that can exceed the limit but still not be classed as exceedances. Then you have other checks that are not continuous monitored, but are monitored perhaps twice a year. Again, incinerator operators can be careful about what they burn during those periods of time and they can obviously prepare for any visit from the EA. The EA does not have the resources just to appear unannounced, so everything is organised in advance. Many UKWIN members are distressed by the fact that there are no unannounced visits from the EA.

On the spot-checking - that is, the twice-a-year checks - there is a study by De Fré that identifies that when you continuously monitor for these same substances, you find that actual emissions are 30 times higher than the results you get from the twice-yearly checks.

In addition to that, the EA has the very strange habit of imagining that if there is no exceedance register, then the equipment must be functioning just fine. If there is an exceedance, then that can be put down to a calibration error in the equipment. There are a lot of potential exceedances that are ignored. There is a lot of

potential non-compliance with environmental permits that is not picked up on. Then we get on to a whole host of emissions from incinerators that are not monitored or checked by anyone, that are not part of the environmental permit. It is not that the incinerator operators are doing anything wrong, because the EA does not require it of them, and obviously there would be an expense. To some extent, with gas spectrometers, etc, it can be expensive and indeed it may not be technically feasible to measure everything that comes out of the chimney stack. Although it is certainly true that the majority of what comes out is either greenhouse gases or steam, that does not mean to say that the so-called "small" amount of other material that comes out does not bring with it adverse health impacts.

**David Kurten AM:** You mentioned dioxins. I know they are organic peroxides, are they not? That is what dioxins are. You also mentioned the word 'interferons'.

**Shlomo Downen (National Co-ordinator, UKWIN):** Furans. Not interferons.

**David Kurten AM:** Furans.

**Shlomo Downen (National Co-ordinator, UKWIN):** Furans. F-U-R-A-N-S.

**David Kurten AM:** They are organic --

**Shlomo Downen (National Co-ordinator, UKWIN):** It is just one of those 'bad neighbour' families, shall we say. A family of chemicals.

**David Kurten AM:** Furans. They are organic rings with an oxygen in them.

**Shlomo Downen (National Co-ordinator, UKWIN):** That is right, yes.

**David Kurten AM:** Furans. Thank you very much.

**Julian Walker (Chief Operating Officer, Cory Riverside Energy):** It is worth pointing out the position of our plant. We are based at Belvedere. We sit with the Thames Water sewage treatment plant, which is huge, to one side of us, and then a large distribution centre on the other side.

In regard to emissions, we continuously monitor ourselves and we report to the EA. We report on a monthly basis, and if you look at our website you can see what our half-hourly averages are and also our 24-hourly averages. They are available on our website.

In addition, King's College London has a number of monitoring sites around our facility, some at the facility, some quite a long way away, so on the other side of the river, and it submits a report to Bexley as part of our original planning application. It had to start that monitoring process two years before the plant went live. It is quoted, and this is from its report,

*"No impact on air quality has been detected at any of the monitoring sites since the Riverside Resource Recovery Limited (RRRL) facility started operation in 2011."*

What I would say is that is ours, and that is the only one that I can talk for, but I think it is important that it comes back to this point about having the right modern technology operating that meets the standards that are required.

**David Kurten AM:** Do you test for dioxins and furans that Shlomo was talking about?

**Julian Walker (Chief Operating Officer, Cory Riverside Energy):** Yes, we do.

**Leonie Cooper AM (Chair):** Do you test for them constantly or intermittently, as he was describing?

**Julian Walker (Chief Operating Officer, Cory Riverside Energy):** I need to reconfirm this, but I believe we test them permanently, continuously. We are happy for the EA to come and do a check.

**Leonie Cooper AM (Chair):** Yes, but the implication was almost - I am really sorry to also poach into your questions, David - that because you know when it is going to happen in advance, you do some sort of Volkswagen (VW) 'diesel-gate' preparation, not by using an algorithm so that the vehicle recognises it is being tested, but because you get a letter from the Environment Committee telling you which wet Wednesday they are going to turn up on. Therefore, you stop burning noxious substances, you take all the plastic out of the waste stream, and you only burn nice things for some time, and then they turn up and it is all terribly hunky-dory. Is that how you set about it?

**Julian Walker (Chief Operating Officer, Cory Riverside Energy):** No, certainly not. Certainly not. We receive black-bin waste, so it is literally black-binned. We do not handle it at all. It comes in in the containers that you see going past the river, and then it is put into a large bunker, where the grab extends and puts it in three grate lines. In no way do we sort the waste in advance of an EA visit.

**Leonie Cooper AM (Chair):** Can I just hear from Viridor? Are you able to sort the waste in that way? You operate Lakeside currently, which is obviously very close to London, although I do not think it takes London waste.

**Dan Cooke (Director of Regulatory Affairs, Viridor):** It does. It takes about 120,000 from the West London Waste Authority and about 45,000 from the South London [Waste Authority] at the moment.

**Leonie Cooper AM (Chair):** Apologies. Then you are going to have the plant at Viridor. Are you able to sort the waste and prepare it in that --?

**Dan Cooke (Director of Regulatory Affairs, Viridor):** It is pretty much as Julian described. The waste comes in in various lorries. It is tipped into a bunker, and the only sorting is effectively lifting and mixing to make sure it is as homogenous as possible and to make sure that there is a last inspection for anything that should not go into the combustion chamber - like gas cylinders, for example - which might compromise it.

I would agree with Shlomo on one thing, and that is that we do often find in terms of local communities that there is always, with the prospect of an energy plant being built near them, a degree of stress and uncertainty. That is why we have very close liaison, and very close consultation, all the way through the planning process, etc. However, I would disagree, once it is operational, with Shlomo's comment about nuisance noise and odour. Indeed, we have community liaison groups at all of our facilities to make sure that any concerns around certainly noise, odour or any form of nuisance are addressed and talked about, etc, and we have very few. These plants are sophisticated bits of engineering, and the noise cladding and the noise insulation means that you can stand outside the plant and you really would not know what it did. Odour is dealt with because the whole building is kept under negative pressure, so when the shutters go up to let a lorry in, air rushes into the building rather than out of it. That air, which is kept under negative pressure, is then fed through the combustion chamber to destroy any odorous compounds. They are really quite sophisticated bits of kit.

In terms of the air quality standards, all our plants operate to very strict standards, which are laid down in the permit. The permit has to meet a very detailed air-quality impact assessment. That is what dictates the conditions that are set within the permit. That will dictate, in itself, where the facility is located, all the local topography, the existing air quality conditions, etc. It really is a detailed and rigorous process.

Likewise, it is a big step away in terms of the potential impacts, whether that be stress, nuisance or air quality, from landfill and other forms of waste treatment. These are highly controlled bits of kit. The range of controlled substances is monitored for on a continuous basis. We have half-hourly limits, we have daily limits, we have annual limits, and the EA rigorously inspects the performance record of the plant. Indeed, at the Lakeside plant, we put our performance record on a live screen in the visitor centre. Anybody visiting, whether

it is the EA or the public - we have community and school groups coming through the plant - can see the operation so it is as transparent as possible.

We will operate Beddington in exactly the same way as existing plants. They have excellent compliance records and all of that information is on the public record. The EA is a very effective and robust regulator. We have annual audits and they are very detailed, but we effectively have an open book with the EA. At any time, they can request information and we have to supply it. Indeed, we have talked about an effectively live and continuous supply of information so they do not have to visit the plant if they do not want to, to see that performance record, but they do turn up for unannounced checks and obviously that is welcomed. As a sector, the scrutiny, the robust regulation, is what we thrive on. Those are the main points.

**Leonie Cooper AM (Chair):** There are unannounced inspections?

**Dan Cooke (Director of Regulatory Affairs, Viridor):** Yes.

**Leonie Cooper AM (Chair):** Have you been subject to unannounced inspections as well?

**Julian Walker (Chief Operating Officer, Cory Riverside Energy):** It is to be confirmed, but I am sure --

**Leonie Cooper AM (Chair):** Can you confirm --

**Julian Walker (Chief Operating Officer, Cory Riverside Energy):** We operate under the same permit system as Viridor for any of their plants so we would be obliged to follow the same rigorous regime as them. I can come back to you and confirm that.

**Leonie Cooper AM (Chair):** That would be very good, for us to know that that is the case. Also, for both Viridor and Cory - we also heard from Veolia at the last meeting - and all of those who are operating waste plants in London, we can confirm through our scrutiny team that everybody is conducting the constant monitoring.

**Shlomo Downen (National Co-ordinator, UKWIN):** Two very quick points. First of all, no comfort can be taken from hearing that there is no pre-sorting that goes on at these incinerators. That means that if someone puts battery or waste electrical goods into their waste, then that will be incinerated without any filtering.

Second, as the National Co-ordinator for UKWIN, I speak to hundreds of people who live near incinerators. I am aware of hundreds of complaints that were put in for the Runcorn incinerator. Surely you are aware that the community in Runcorn is complaining about noise and about odour. They are so frustrated by the lack of action by the EA that, in my understanding, they are turning to the courts for redress.

**Leonie Cooper AM (Chair):** Which borough is that plant in?

**Shlomo Downen (National Co-ordinator, UKWIN):** That is outside London. Runcorn is in Cheshire.

It gives an illustration. Facilities that are operated by Viridor, for example, are not free of complaints, as we have just heard. I am aware of hundreds of complaints. Local residents are keeping logs when they are woken up at 3.00am by noises from the trains delivering waste. Originally, planning permission was granted for RDF, and then the planning permission was changed to allow for mixed waste. There was outdoor storage of the RDF. Now there is outdoor storage of mixed waste; that creates odours, and on you go. The idea that everything is OK is a false impression.

**Dan Cooke (Director of Regulatory Affairs, Viridor):** Dealing with a few of those points: one, we cannot have trains at 3.00am. The trains have to stop deliveries to the Runcorn plant at 11.00pm. We did have quite a spate of complaints in the commissioning phase of the plant; it is one of the biggest plants in the UK. It is comparable in size to the Riverside plant.



**Leonie Cooper AM (Chair):** I do not want to get into a long discussion about --

**Dan Cooke (Director of Regulatory Affairs, Viridor):** The only sustained complaints we have had there were during a short commissioning phase. We have dealt with them very effectively.

**Leonie Cooper AM (Chair):** Much as I am interested in Cheshire as a holiday destination, it is not relevant to what we are doing here at the London Assembly.

What I would ask is that as well as asking for the scrutiny team to be sent details from Viridor, Cory and others operating incinerators, about the kind of monitoring that is going on, Shlomo, perhaps you could supply any evidence concerning ongoing complaint situations that currently exist that you have relating to London EFW plants. I would rather not broaden that to include Runcorn, if you do not mind.

**Joanne McCartney AM:** How should we maximise energy produced by EFW? What could the Mayor do to assist?

**Tim Rotheray (Director, The Association for Decentralised Energy):** The biggest step change that can be made in recovering energy from EFW plants is recovering the heat that is generated when you combust it; you produce electricity and there is heat that can be taken off. You can routinely increase the efficiency from in the 30% range to over 60%. It is a significant opportunity. To do that, you need to have a heat customer. You need to have either one large industrial site, where they can take a large volume of heat, or you need to have a network of pipes. The London Plan has an ambitious aim for increasing heat networks across London. We have seen a lot of work being done on that. That is extremely helpful for creating these networks, which, when they are of sufficient scale, can absorb the heat that is generated.

There are already some. Recently we have seen the South East London Combined Heat and Power (SELCHP) plant, which was running for 19 years without recovering heat, now recovering heat and supplying thousands of residents with heat, which has reduced their heating costs.

**Nicky Gavron AM:** How many megawatts?

**Tim Rotheray (Director, The Association for Decentralised Energy):** They have shut down 10 megawatts of boilers. One assumes, roughly, that they are talking about 10 megawatts of heat supplied. That is a significant amount and, of course, it can do much more.

**Nicky Gavron AM:** That is nothing.

**Tim Rotheray (Director, The Association for Decentralised Energy):** It is not nothing; it is significant. The average peak home demand is maybe 35 kilowatts, so 10,000 kilowatts is a significant amount of heat and it is a significant amount of boiler plant, which was old and polluting and less controlled than a waste plant, so it is significant. However, to increase that you have to increase the network. There is a lot that London is able to do and the London Plan is extremely encouraging on that.

There is also a bigger question about how you enable that kind of infrastructure to be built. We, as an association, have for about the last year been doing work on that. In January [2018], we will be publishing our recommendations for how heat networks could be built. The two things we are looking at are how you reduce the cost of building networks and make them investible by institutional investors, and how you ensure that they give customers a good deal and good-quality service. We are doing a piece of work on that right now. We will soon have some information that we will be delighted to send you.

**Leonie Cooper AM (Chair):** Did you say January?

**Tim Rotheray (Director, The Association for Decentralised Energy):** That is right.

**Leonie Cooper AM (Chair):** It would be great if you are able to share that with us. That is still within the boundary of the response period for the London Plan, so no doubt you will be submitting to that.

**Tim Rotheray (Director, The Association for Decentralised Energy):** We will be delighted to. We have already engaged with colleagues from the GLA on it, and they are involved with the work.

**Leonie Cooper AM (Chair):** Excellent.

**Joanne McCartney AM:** I represent Enfield, which is where the Edmonton incinerator is based and where the Council has ambitious plans for their own energy company and to use the heat that is generated there for a new development. Presumably it is a lot easier to put these heat networks in for new developments, but what are the challenges in extending those to our, often, historic streets? Is that possible, or is that not really viable?

**Tim Rotheray (Director, The Association for Decentralised Energy):** It is possible. At the moment, the key challenge is the fact that if you are a builder of gas networks, power networks or water networks, you have a regulatory structure that gives you permissions in terms of accessing the roads and putting in pipes, and it also standardises a whole load of particular activities in order to effectively de-risk the investment. That does not exist in the heat sector. That means that currently the barrier to entry is much higher. There are significant retrofits of heat networks in London; Islington is probably the most famous but there are also others outside London. It is totally achievable, but it does need to have a framework around it in order to de-risk that investment. That is effectively what this task force is looking at. We know it is achievable but you cannot do it in a world where other networks have a de-risked investment structure and heat does not.

**Julian Walker (Chief Operating Officer, Cory Riverside Energy):** I would like to reinforce that point. We are in the process of discussing with Bexley and Peabody for the Thamesmead development to be able to supply heat to 20,000 homes they are going to build, from the existing facility, because we have the capability to do it, and then also in the future.

One of the other things that we are exploring now is essentially to be able to work with Bexley for them to be able to set up an Energy Services Company (ESCO), like Angelic with Islington, and, therefore, through a mechanism - and needs to go through Ofwat and get cleared as to whether this is possible or not - provide electricity for the local community. Obviously, if it is through a private wire, you do not have to pay the UK Power Networks infrastructure charge, which more than doubles the price of electricity. In terms of benefit to the local community, you can supply lower-cost heat and lower-cost electricity. I think we may be coming on to that, Chair. I apologise if I have stepped ahead, but I think that is a very important opportunity, certainly for ourselves - I cannot speak for others - to be able to work very closely and bring benefits to the local community.

**Dan Cooke (Director of Regulatory Affairs, Viridor):** Very quickly, I would reiterate, in terms of maximising energy efficiency at the Beddington plant, we have the formal agreement with SDEN. We will be plugging that in to deliver heat pretty much from the off, as soon as the plant is there and the end users are available, and that will provide heat to a mixture of local homes and businesses.

There are two things in response to your question about what London can do to help. One of the main drivers there, undoubtedly, is a combination of planning and contractual requirement. That was a partnership discussion during both of those phases.

I would finish by saying it is not easy. Delivering heat requires cross-sector collaboration and long-term planning to get it to an economically viable point to deliver those long-term benefits. However, as a company we look often to the continent in terms of where the best practice with heat networks is. We have already talked about Copenhagen, for example. Capital cities that have over decades begun to plug in and build on the networks, at some of the modest megawatts and starting points, and that is what it is all about. It is about

getting these things off the ground and then hopefully being able to deliver the greater benefit over the long run.

**Professor Darryl Newport, University of East London and Institution of Civil Engineers**

**Representative:** It is interesting to look at this. I have worked with areas like Barking Riverside, which originally were going to have a heat network put in, but for a large facility like Barking Riverside, 12,000 homes, it has not happened and it will not happen, I do not believe, now, because the systems are not available locally. When we are looking at planning for these types of facilities, we want to look at what the future developments are.

In terms of your question about existing homes, retrofitting is even more difficult, obviously, because of all the implications of upheaval and so on within the local areas. Again, it is not going to happen if we cannot put these systems into newbuild solutions like Barking Riverside, and Old Oak Common and places like that.

**Joanne McCartney AM:** Can I ask Andy to address those comments, and what the Mayor can do about it, particularly with the London Plan? Have you looked at using that to create a decentralised energy network? What are you looking at there?

**Andy Richmond (Policy and Programmes Manager, GLA):** Certainly, quickly reiterating the things we are doing.

In terms of ensuring that facilities are operating at their highest level of efficiency, we have the CIF, which was an innovative policy, the first of its kind internationally that I am aware of, that requires any EFW, both in terms of the waste going to a plant or any new plant, to be as energy efficient as the energy source that it is displacing, which at the moment is combined cycle gas turbine, which effectively means either the waste source needs to be highly biogenic or you need to have a district heating network. Pushing it forward in terms of policy, the London Plan sets out the ambitions for decentralised energy networks and there are a number of policies within that. I am not necessarily qualified to refer to them directly. I do have the London Plan but I must say that I have not worked my way through it all yet.

In terms of programmes, we have the Decentralised Energy Enabling Programme (DEEP), which is running from City Hall and is working with all the existing operators within London to support them in district heating. In addition to that, we are looking at demand-side response - the point that Tim made earlier - that if you can increase the efficiency even further, when you have maximised the energy output through electricity and heat uptake, you can maximise that efficiency even further by using demand-side response and using storage to make sure that is being delivered at the most appropriate and beneficial times.

**Joanne McCartney AM:** Does City Hall take an active interest in planning applications and energy? I am concerned to hear from Professor Newport that there is a large housing development where that has not been possible to fit in.

**Andy Richmond (Policy and Programmes Manager, GLA):** Yes. In terms of planning applications and energy, we do a lot. However, the challenge that all local authorities have is that we see planning applications when they come in, they go through the permitting process, and we ensure that they are in general conformity with the London Plan. We have a team of officers and, indeed, some consultants, who look at the energy master plans of any large-scale development. We see anything over any kind of large-scale residential developments, 840 dwellings, and we ensure that they meet the Mayor's zero carbon policy and use the energy hierarchy in order to address that. District heating is one of those opportunities within that hierarchy. We ensure that where there is the potential to connect to a district heating system, we look at the possibility.

Another thing is you can have a facility that comes forward with a communal heating system but there is no district heating opportunity at that point. We are now trying to make sure that any development that comes forward with a communal heating system - and there is a potential for a neat network further down the line - would be able to decouple the communal system from its existing energy source and connect up to a district

heating system. We are trying to build in that flexibility for future opportunities at that point of design. However, I would say that we are a long way from seeing such a planning application, approving it, and the developing getting built out.

**Shaun Bailey AM:** You say you look at district heating plans and the newbuilds, so what went wrong in Barking Riverside? The consensus seems to be that in a brand-new development is where this is most easily done. If we cannot do it in such a big development, with this on our minds, how are we going to achieve it at all?

**Andy Richmond (Policy and Programmes Manager, GLA):** I could not comment on that development but I can provide you with whatever information we have.

**Shaun Bailey AM:** We would like to see that because it is worrying if we cannot do it in Barking Riverside, which had such a big fanfare around it and was a big opportunity.

Tim, when you talk about district heating, what physical proximity does a place need to be to be retrofitted? Do you need something on your doorstep, an incinerator to provide that heat, or can it be done over large spans of distance?

**Tim Rotheray (Director, The Association for Decentralised Energy):** When you are supplying large volumes of heat into a large city-wide network, the heat can be supplied from a large point source over tens of kilometres (km). The largest that I am aware of is over 100km, not in the UK, and your temperature losses on that kind of a network are very low because it is a big pipe with a large volume of heat. You are talking about maybe less than half a degree per km. You end up with very low losses on those networks, so you can do that. However, that does mean you have to build a lot of pipes. When you have sources of heat, as we do in London, nearby sources of demand, that has the ability to improve the overall system efficiency.

It might also be worth coming back to that point about, yes, it has failed on the Barking scheme, but it is worth noting that there are other parts of London - such as the development at Greenwich and developments at Enfield, where there are thousands of homes - which are being developed with heat networks, so it is achievable and the London Plan has been exceedingly helpful in driving that, as have retrofits. I mentioned SELCHP, which is thousands of homes that have been connected. Retrofit and newbuild are achievable but you do need the right policy in place.

**Leonie Cooper AM (Chair):** Maybe in relation to Barking Riverside, to answer Assembly Member Bailey's point, what we can do is write to David Montague. He is the chief executive of London and Quadrant Housing Trust (L&Q). It is an L&Q development, with others. They might be able to answer the question about why. It is an 11,000-home scheme, so fairly large. There must have been a reason why, in the end, they decided not to proceed with the CHP network, or any arrangements of that nature, unless you can answer that now.

**Professor Darryl Newport, University of East London and Institution of Civil Engineers**

**Representative:** No, 51% is owned by L&Q and 49% is owned by the GLA, so the GLA is aware of that. One of the biggest problems was that Barking Power Station was originally going to provide some of the heat and unfortunately that closed so there were issues in terms of how that would be put forward. However, the infrastructure is the important part here in terms of going into the ground. Funnily enough, since that time there are two anaerobic digesters which sit on the boundary of Barking Riverside that do not have any involvement with Barking Riverside at all.

**Leonie Cooper AM (Chair):** But they presumably produce gas that is then sold back to the gas network but does not go to that site. A failure of planning.

Nicky, we are going to come on to all your questions in a moment.

**Nicky Gavron AM:** It is applicable to this bit.

**Leonie Cooper AM (Chair):** I am just going to ask something very brief about Brexit, and then we are going to come to Nicky, who is going to scoop up all her questions into a long list with different issues, and then that will be the end of our session on the final part of the waste hierarchy.

We have already referred to the fact that some waste is exported abroad, which is an issue for London in terms of the self-sufficiency that Andy was referring to. How do you expect Brexit and the as-yet-to-be-completely-decided arrangements in terms of tariffs, regulations, changes in the exchange rate and so on to impact waste departing from London? Also - and this might be a point that either Dan and Julian can comment on - there have been discussions about a Chinese willingness to accept some of our waste. Apparently, some of it still goes to China. I believe they are changing their tariff arrangements too, so they might be somewhat less accepting of some of our rubbish going there to be dealt with. How do you think these things might change and impact?

**Andy Richmond (Policy and Programmes Manager, GLA):** I have probably not done as much research on the impact of Brexit as some colleagues around the table have done.

**Leonie Cooper AM (Chair):** It would appear that David Davis [Secretary of State for Exiting the European Union] might fall into the same category as well, but leaving him to one side.

**Andy Richmond (Policy and Programmes Manager, GLA):** In policy terms, it makes very little difference to us. I would remind people that our 100% self-sufficiency target is a net self-sufficiency target. Waste does move across political boundaries. We want London to get the maximum benefit out of the resources that it manages. Brexit does not make any difference. We do want to manage as much of that waste as possible within the boundary anyway.

Regarding the impact that it might have on local authorities within London, those local authorities that are either exporting directly - I do not think there are many - but more indirectly because it is down the supply chain in the process, we are engaging with the Department for Environment, Food and Rural Affairs (Defra) now to work out what kinds of numbers they are generating in terms of what they think the impact of Brexit is going to be. Waste that flows across national boundaries is subject to all the same import and export rules. It will be, or might potentially be, a big issue but it will be the same issue as any export and import relationships that we have with European member states.

**Leonie Cooper AM (Chair):** Whatever those might be.

**Andy Richmond (Policy and Programmes Manager, GLA):** Whatever they might be, yes.

**Leonie Cooper AM (Chair):** If you could tell us, you would probably be snapped up to be part of the negotiating team.

Dan and Julian, do either of you want to come in on these potential tariffs, regulations or exchange rates or any other issues that you see flowing from Brexit or the change in Chinese willingness to accept our rubbish?

**Dan Cooke (Director of Regulatory Affairs, Viridor):** I probably cannot offer the level of insight that all of us seek on exactly how it will pan out but I would reiterate that the policy ambitions of London and the UK should remain the same, regardless, and that is to continue to work towards the balance between high levels of recycling and complementary levels of recovery, and, as London moves towards a more circular economy, the contribution that our sector and the higher levels of recycling and resource productivity as a whole will continue to make.

In terms of immediate impact, the exchange rate, for example, has already made the export of RDF to the continent less attractive and that has become part of the hardening of the market over there, which means

that the emphasis on making sure that London and the rest of the UK have their own capacity for both recycling and recovery becomes more and more important.

Operation Sword is the Chinese tightening of quality standards, so it is not tariffs they are putting on; they are just tightening up their quality standards --

**Leonie Cooper AM (Chair):** What they are willing to accept.

**Dan Cooke (Director of Regulatory Affairs, Viridor):** Especially paper and plastics. China, as part of its own circular economy programme, is looking to become more self-sufficient and prioritise materials generated in China, which is one of the reasons it is raising the standards and that has made it, and will make it, a massive challenge for us as a recycling company and indeed the whole sector, because we have relied on far eastern markets, as well as European markets, for a lot of the paper and plastics that we all want to recycle. It is all very well collecting it; it has to find an end market, and the majority of the demand has come from China and the far east. We have been able to place most of the recycling that we collect in London and elsewhere in other markets, some in the far east, but more and more we are now focusing on what we can do to stimulate markets within the UK. There are some things we are asking the Government, and we would ask the GLA to consider as well, around green procurement standards, for example, so public procurement, insisting on minimum levels of recycled material. There are a number of other things at UK level in terms of preferential rates of valued-added tax (VAT) that we could do in the UK to stimulate the markets long term for recycled products if we really want to move towards a circular economy.

**Leonie Cooper AM (Chair):** That is interesting. You are suggesting that there is more that the Government could do to be more of a driver in this area, to drive down feeding the level of waste at the top end in the first place, joining the Chinese, who seem to be the driver here themselves.

**Julian Walker (Chief Operating Officer, Cory Riverside Energy):** One quick point. In terms of the impact that we are seeing from China, it is on the recycling. Through our Smugglers Way plant, we sort 76,000 tonnes of recycling that is commingled. It is sorted into plastics of various types, paper, cardboard, etc. The prices in China have dropped considerably. Touching on the exact policy of Operation Sword, they are now talking about 1% contamination for allowing the product into China, so it comes to this point of having a source. I agree very strongly that we need to create the markets in the UK to be able to treat the recycling - the paper, the plastics, etc - as part of that circular economy. We are very keen to work with both the Government and the local authorities to encourage that.

**Leonie Cooper AM (Chair):** It sounds like there is quite a lot more to be done in this particular area.

**Shlomo Downen (National Co-ordinator, UKWIN):** First of all, it looks as best we can guess that there will be some form of transition period, and that means that we can expect that the circular economy package will apply to the UK even after we have left the European Union. That is important, not least because within the circular economy package there is recognition in the whole circular economy concept that incineration is a leakage from the circular economy. Things go around and around when they are recycled and composted. When they go to incineration, they are lost forever, wherever it is incinerated. As we move to an increasingly circular economy, there will be less of a role for incineration to play.

Also, there is the hope in relation to London that maybe waste can be a devolved responsibility for London, which would then allow London to charge an incineration tax. There is a recognition that there are market failures that mean that the cost to society - that is the cost to the people living in London - of incineration is not met through the operators of the incinerators. Again, I do not expect them to part with their money voluntarily, but if there was an incineration tax in the same way that there is a Landfill Tax in recognition of the disbenefits of landfill, London would be in a position, if responsibility for waste were devolved to London as part of a wider Brexit deal, to impose an incineration tax on incinerators in London.

**Leonie Cooper AM (Chair):** That is an interesting point. Perhaps it might be even better to put some sort of tax on people who wantonly produce packaging and lots of other things that then comes in at the top --

**Shlomo Downen (National Co-ordinator, UKWIN):** A key resource tax, absolutely, but --

**Leonie Cooper AM (Chair):** In the 'polluter pays' principle, the people who are bringing the material into the chain right at the top, perhaps that is the better place to have the tax taken rather than lower-down manufacturers.

**Shlomo Downen (National Co-ordinator, UKWIN):** Indeed, plastics manufacturers.

**Leonie Cooper AM (Chair):** I am now going to move on to Nicky, whom I know has scooped up a couple of issues from before. Burning issues, Nicky?

**Nicky Gavron AM:** Burning issues, yes. Thank you for your indulgence. Andy, I want to think a bit more with you about the CIF because I have not seen the London Plan section on this, but the Environment Strategy is very strong on the CIF being at about 400 grams of carbon per kilowatt hour. You could tell me what you are expecting but I think you are expecting heat to be taken off existing incinerators and off the new ones as well, Beddington we are hearing about and then Edmonton. Is that correct?

**Andy Richmond (Policy and Programmes Manager, GLA):** That is correct, yes. It is 400 grams of CO<sub>2</sub> per kilowatt hour, which is pegged to a combined cycle gas turbine as the marginal source of energy, but we consider EFW, if it had district heating, to displace that need for a combined cycle gas turbine.

**Nicky Gavron AM:** Yes. We have just been hearing that it is 10 megawatts from SELCHP and I am really pleased that SELCHP is now taking the heat off. We do not know what Beddington is going to produce but it is going to how many thousand homes?

**Dan Cooke (Director of Regulatory Affairs, Viridor):** 800.

**Nicky Gavron AM:** 800?

**Dan Cooke (Director of Regulatory Affairs, Viridor):** To start with, the district network that they all plug into is 800 but, as I said, that is the platform to build on.

**Nicky Gavron AM:** Yes, but hopefully it could go to some more, could it not?

**Dan Cooke (Director of Regulatory Affairs, Viridor):** Yes.

**Nicky Gavron AM:** In Belvedere, you explained that there is no heat taken off at the moment.

**Andy Richmond (Policy and Programmes Manager, GLA):** We are able to do that and we are in discussions with Thamesmead and Peabody to supply that to 20,000 homes. When construction happens of that development, then we will feed into that.

**Nicky Gavron AM:** A group of north London people met in Edmonton not long ago and I think they were saying that they were looking at 28 or 38 megawatts. I cannot remember, but it was not a huge number. Anyway, Andy, is that in the ballpark of what you are looking at?

**Andy Richmond (Policy and Programmes Manager, GLA):** It is, yes. Our ambition is that the facilities are as efficient as they possibly can be. The Edmonton replacement plant and the development in the Upper Lee Valley will provide a very large opportunity for an expansive heat network to deliver heat.

One thing we are looking at now is whether we can look at lower-source heat networks, as the industry sees that these are potentially more efficient than the higher heat networks because you can operate your plant, you can still take more electricity off the plant and provide a lower level of hot water, which can then be distributed further and to more developments, which will just require small amounts of upgrading in the home itself. It then enables the householder or the recipient of the water to be able to control the level of heat that they need.

**Nicky Gavron AM:** That means, though, a lot of money, does it not, with longer runs of pipes?

**Andy Richmond (Policy and Programmes Manager, GLA):** Potentially, but they can be smaller pipes. They can be narrower pipes going a lot further distances.

**Nicky Gavron AM:** Yes, I know. Because we are up against time, that is useful to know. Basically, Edmonton's implication at this meeting was that they did not want too much heat taken off because then it would make their electricity very inefficient. I was quite surprised by that. They said there would have to be some sort of trade-off in terms of costs. They would have to make the heat more expensive because of the lost electricity. I just wondered if anyone had a comment on that because we were quite perplexed by that.

**Tim Rotheray (Director, The Association for Decentralised Energy):** It is the physics of running a plant. Steam enters into a steam turbine, which is a cone shape. It goes in at high pressure and it comes out at low pressure. The point at which you take that steam out of the turbine impacts the amount of energy you are taking out. If you take out 900 --

**Nicky Gavron AM:** Honestly, you could write to us with technical stuff, but is that right? Is the electricity less efficient?

**Tim Rotheray (Director, The Association for Decentralised Energy):** My point is that you are taking energy out of the steam turbine and, therefore, you are sacrificing electricity to make heat. Normally, on a temperature heat network, depending on the temperature, for every one unit of electricity you lost, you would get three to ten units of heat. If you take off one kilowatt hour of electricity, you will get between three and ten kilowatt hours of heat. Yes, there is a sacrifice: you get a very significant amount of heat for a small amount of electricity. That is correct.

**Nicky Gavron AM:** Also, our understanding from that meeting is that there is a limit to how much heat you should really take off anyway because the whole thing is geared to giving electricity. That was the implication of what was said and I am wondering about --

**Tim Rotheray (Director, The Association for Decentralised Energy):** It is really about plant design.



**Nicky Gavron AM:** I am wondering about the CIF because we know that if you just take electricity off, it is very high carbon. If you take heat off, you make it lower carbon. At the moment, just thinking, the grid has been really heavily decarbonised, which is great, and so it is now running at about 300 to 400 grams per kilowatt hour. We are trying to get to 400 by taking the heat off. At the moment, as I understand it, most incinerators or EFW plants, just with electricity, are running at about 700 grams of CO<sub>2</sub> per hour. Andy, does that square with what you know?

**Andy Richmond (Policy and Programmes Manager, GLA):** We are fully aware that the energy system is being decarbonised and we are aware that we need to keep monitoring the level at which we set the CIF so that it does match up with a decarbonised energy system. We will continue to monitor.

The CIF has been put in and has remained at the same level because we are fluctuating still at the moment, and we are still in the position where we are looking to get district heating networks from all of the existing plant within London.

When we get to that position and the grid starts to decarbonise more, we will continue to monitor the level at which the CIF is set because the level can change depending on what your input material is as well. It is not just a case of the efficiency of the plant and what the energy source it is replacing; it is the feedstock of that plant, also.

**Nicky Gavron AM:** Talking about feedstock, in the Environment Strategy you mentioned something about extracting plastics from residual waste. I found that really interesting because - and I forget what the name is - there is a technology for taking plastics out of black-bag waste. We should be putting those in front of all of our incinerators, but I was confused by the fact that we were told that black-bag waste is not sorted. Is that correct?

**Julian Walker (Chief Operating Officer, Cory Riverside Energy):** Sorry, I will come in for Belvedere quickly. Just in terms of our rating for CIF, we are only electricity at the moment and we will move to doing the district heating once we have the Thamesmead development done, but we are at 450 at the moment. It comes back to the point about technology.

**Nicky Gavron AM:** You are at 450?

**Julian Walker (Chief Operating Officer, Cory Riverside Energy):** We are above the 400. We are at 450 grams of CO<sub>2</sub> per kilowatt hour.

In terms of sorting, we do not sort the black bin bags as such. We receive it in and the only thing that does happen is that it does get mixed by the grab within the bunker to get a homogenous product so that we do not get massive peaks and troughs of the CV.

**Dan Cooke (Director of Regulatory Affairs, Viridor):** A couple of points. Firstly, when it comes to overall carbon intensity, we have talked about the direction of travel. We have to bear in mind the prime purpose of these plants is to safely and efficiently deal with non-recyclable residual waste. The energy output is a benefit and one that we are looking, along with heat, to maximise as we go forward and optimise the plants we are building, but it is all about moving material - and these are hundreds of thousands of tonnes of material created by all of us at home and at work - away from landfill into a safe and cost-effective treatment methodology. The energy output is very important and it has all the benefits that we have talked about, but we should not lose sight of that.

In terms of sorting black-bag waste, the best place to sort waste is at the household or the business. We work with our local authority, clients and partners to encourage consistent collection schemes.

**Leonie Cooper AM (Chair):** Can I just say? I do not want to get too far into waste segregation and sorting. Nicky, I know that you were not at the last meeting when we went into this for a whole meeting and neither were you, Dan, and so --

**Nicky Gavron AM:** Sorry, Chair. All I am trying to introduce --

**Leonie Cooper AM (Chair):** Can I just remind you? There are some questions here that we have not yet touched on --

**Nicky Gavron AM:** I will get on to those.

**Leonie Cooper AM (Chair):** -- and we wanted to finish this section at 4.15pm and it is in fact 4.14pm. You have about a minute left.

**Nicky Gavron AM:** I am going to be very quick. I will have to speed up. Sorry. It is just that I am really interested in the idea of taking plastics out of black-bag waste because it will reduce your CIF and it will mean - we do not have biogenic plastic at the moment - we are not burning fossil fuels. That is the point I wanted to make and we should be looking at this new -- it is very old technology, actually, but there is a --

**Leonie Cooper AM (Chair):** We spent a lot of time on segregation of waste and the London Waste and Recycling Board (LWARB) route map to the circular economy, which talks a lot about textiles, plastics and waste electrical and electronic equipment (WEEE) separation and all the rest of it. Can we move on to your questions?

**Nicky Gavron AM:** Yes. This is a technology which is --

**Leonie Cooper AM (Chair):** Can we move on to your questions?

**Nicky Gavron AM:** Andy, this is really about future capacity. From what you have said, if in fact I have heard correctly, you think we have enough incineration capacity for London?

**Andy Richmond (Policy and Programmes Manager, GLA):** From the modelling that we have done on municipal waste - household waste and waste similar to household waste, which is 7 million tonnes - if we then apply the 65% recycling rate by 2030, if we achieve that, then that leaves just over 2 million tonnes of residual waste that will require treatment and disposal, and that is the existing and planned facilities. The Edmonton replacement and the Beddington plant is around that amount. In terms of that material, we have sufficient capacity.

There are other waste streams, and so that does not include construction, demolition and excavation waste, and excavation obviously is not --

**Nicky Gavron AM:** No, we are just sticking here --

**Andy Richmond (Policy and Programmes Manager, GLA):** Most of it is not. Therefore, I would just say that our modelling has been looking at municipal waste. There are other waste streams outside of that, which we have not looked at in the modelling, but usually would require different types of facilities.

**Nicky Gavron AM:** What about what you have heard about residual waste coming back to us, possibly, from Denmark and northern Europe?

**Andy Richmond (Policy and Programmes Manager, GLA):** In terms of the modelling that we have done, that does not make any difference because we have modelled arisings and treatment. We have not looked at a scenario of what is happening now, and then what might happen in the future. We have looked at the scenarios. What are the arisings? How much waste are we expecting to have in what years? Where would we be on the trajectory to a 65% recycling rate, which is effectively a straight line at the moment, and then what would that mean in terms of the capacity that is needed afterwards? What is happening at the moment is almost irrelevant because what we have not done with this document - and it is right that we have not - is looked at what is happening currently and then how we retrofit something better to what is happening currently. We have looked at it as a clean sheet: this is what is going to be arising, this is the ambition, this is what we want to achieve, and this is what we need in order to do that. The rest of it is what we are going to have to move around to fit this objective.

**Nicky Gavron AM:** I understand. Just on recycling rates at the moment - this is my earlier question but it is to do with recycling - we are at 32% at the moment?

**Andy Richmond (Policy and Programmes Manager, GLA):** We are at 33% as of two days ago.

**Nicky Gavron AM:** Well done. It has gone up?

**Andy Richmond (Policy and Programmes Manager, GLA):** Yes. I know we have gone up 1% for the first time since 2011.

**Nicky Gavron AM:** Fantastic. If you go up 1% a year, then you will be getting beyond your 42%, which you have estimated as being the maximum you can get from domestic household waste as opposed to the commercial waste bit?

**Andy Richmond (Policy and Programmes Manager, GLA):** Yes, that is the modelling.

**Nicky Gavron AM:** As we know, there is a lot of commercial waste. It is very homogeneous, very good for the circular economy and for recycling. I am interested in what your projections are for recycling beyond 2030. Surely, we should be looking at what goes beyond 2030 to get us up to zero carbon.

**Andy Richmond (Policy and Programmes Manager, GLA):** One of the reasons why we have not gone further than 2030 at the moment for a recycling target is we do not quite know what we are going to be experiencing in terms of a circular economy. If the circular economy, which we looked at in the previous meeting, really takes off as an approach to resource management whereby we are no longer in this linear economy where the consumer ends up with the packaging and tries to decide what to do with it, if we end up with a system that is truly circular and the ownership of the resources remains with the producer, then we do not quite know what that is going to mean certainly in the transition to a circular economy or what that would mean to LACU when we achieve that. Therefore, the reason we have not set anything past 2030 in terms of recycling targets is we believe we could potentially be in a very different place where the material that local

authorities collect is truly invaluable material because the valuable material is being retained by the producer and the manufacturer because that is how a proper circular economy works.

**Nicky Gavron AM:** Producer responsibility?

**Andy Richmond (Policy and Programmes Manager, GLA):** Yes, increased producer responsibility is a pathway to that full circular economy. That is why we are potentially on this eve of a resource revolution and to set recycling targets further than 2030 based on a linear economy could be a hostage to fortune.

**Nicky Gavron AM:** I see. I understand now. That makes a lot of sense. One of the scenarios could then mean that we have some stranded assets?

**Andy Richmond (Policy and Programmes Manager, GLA):** One of the benefits of heat networks and providing heat networks from existing EFW plants is that there is some kind of heat system available. By linking into a district heating network, you can then be in a position where EFW plants is replaced with energy, for instance, feeding into that district heating system. One of the additional benefits that --

**Nicky Gavron AM:** Say that again?

**Andy Richmond (Policy and Programmes Manager, GLA):** If you are connecting an existing EFW plant to a district heating system, your EFW plant, as well as fulfilling all the requirements of an EFW plant, is also a heat source to that network. Therefore, there is no reason why you cannot remove one heat source and replace it with another heat source and supply it to the network.

**Nicky Gavron AM:** I get it.

**Andy Richmond (Policy and Programmes Manager, GLA):** That is challenging the stranded-asset question of a heat network because a heat network does not rely on the original heat source necessarily.

**Leonie Cooper AM (Chair):** That has been a really stimulating, challenging, very wide-ranging and incredibly interesting discussion with our guests, who have come at this in some cases from quite divergent viewpoints. Thank you very much, Committee, for putting all of those questions.

I would particularly like to thank Dan Cooke from Viridor; Shlomo Downen from the UKWIN; Andy Richmond, who has come to all three of our meetings and has therefore heard us starting with the circular economy and working through all the issues around segregation and thank you very much for your contribution; Tim Rotheray from the Association for Decentralised Energy; Professor Darryl Newport who has come from UEL and ICE; and, last again but not least, Julian Walker from Cory Environmental. Thank you very much. That has been a really good discussion.