Appendix 1

LONDONASSEMBLY

Environment Committee

Bring me sunshine!

How London's homes could generate more solar energy

October 2015

Environment Committee Members

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Chair's foreword

You can walk around the capital's streets for quite a while before you come across a roof with solar panels, certainly in comparison to many other parts of the country. In this investigation we set out to find out how London's homes could generate more solar energy.

We looked at the typical explanations for low solar energy generation in London: tall, thin buildings, a larger private rented sector, a higher proportion of flats and a more transient population. We found these were factors, but they did not fully explain why London has the lowest uptake of any region in mainland Britain.

We visited 'Repowering London' in Brixton, a not-for-profit organisation, which through their determination, and against many odds, is delivering community energy and at the same time providing internships and valuable work experience for young people. We also heard from Ascham Homes, which installed solar panels onto 1,000 council properties in Waltham Forest. These organisations are leading the way, but they should be the norm, not exceptional case studies featured in reports. We can learn from them in order to support and replicate this best practice and ambition across the capital.

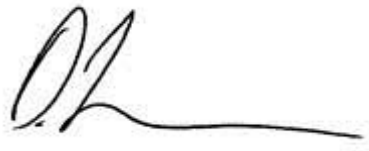
We also found that if London had matched the UK average installation rate between 2010 and 2014, we could have cut our CO_2 emissions by 100,000 tonnes. In December, the Mayor will attend the Paris Climate Change summit, when the spotlight will inevitably turn to clean renewable technologies such as solar energy. London could be playing a real leadership role and match – or even exceed – the ambitions of places such as New York City which intends to deliver an eightfold increase in solar power capacity over the next decade.

The cost of installing solar panels has fallen considerably, with owners recovering their upfront costs over a number of years from reduced energy bills and from government subsidy (the Feed-in Tariff or FiT). As a result, this subsidy is due to be severely reduced or eliminated in the near future by the Government. Described as 'catastrophic' by Greg Barker, the former Minister of State for Energy and Climate Change, this poses an enormous risk to further solar deployment in London.

We heard that housing associations are delaying or abandoning planned schemes, and that some major solar companies have collapsed or are haemorrhaging contracts. We are extremely concerned by the implications of the Government's proposals and have urged the Mayor to lobby against them. He should argue in favour of gradual, predictable reductions in subsidies until the point is reached when consumers can

generate solar photovoltaic (PV) electricity at the same cost as they can buy electricity from the grid, alongside the restoration of the pre-accreditation mechanism.

What we want is a fair and predictable national policy regime, and leadership from the Mayor, so London can plan for a bright and sunny future in terms of renewable energy generation.



Darren Johnson AM

Chair of the Environment Committee

Executive summary

More and more electricity in the UK is being generated by solar photovoltaic (PV) panels on people's homes. The falling cost of panels, combined with subsidies from the Government and rising electricity prices, have seen a rapid increase in the UK's domestic solar PV capacity. Yet, compared with other parts of the UK, London generates relatively little electricity from these small-scale domestic solar PV systems. If London had installed the UK average level of solar PV between 2010 and 2014, we calculate that London's CO_2 emissions would have been 100,000 tonnes lower, and Londoners would have benefitted from an extra £50 million of government subsidies (the Feed-in Tariff). Our investigation attempts to understand why London performs so badly, and what needs to be done to turn this around.

Improving London's solar PV performance will not be easy over the next few years if the Government goes ahead with plans to sharply reduce the subsidies available for new solar PV installations. Although the cost of solar panels has fallen sharply in recent years, it is still more expensive for households to install solar PV than it is to buy electricity from the grid. While this is still the case, few households are likely to install solar PV without subsidies, and there is a risk of London's solar PV market being damaged if subsidies are cut too quickly. We therefore urge the Mayor to lobby the Government to reduce subsidies more slowly over the next few years.

Changes to national planning policies – such as the abandonment of the target to make all new homes zero carbon from 2016 – may slow down solar PV uptake even further. The Mayor and local authorities can still, however, try to increase solar PV take-up through their own planning policies and guidance. We therefore recommend that the GLA ensures that major developments suitable for incorporating solar PV are only permitted if this is included in the design or a planning condition.

At a more basic level, many home owners – and even some planning professionals – are still unsure about the need for planning permission where renewable energy technologies like solar PV are concerned, particularly in one of London's many conservation areas. Boroughs should look at their own guidance to see if it could be improved and clarified.

Is London a special case for solar PV?

London is often cited to be a special case, where it will inevitably be more difficult for solar PV to grow quickly. It has many tall and thin buildings, meaning that fewer homes are suitable. And it has a more transient population with more renters than owner-occupiers, meaning that installing solar PV doesn't make financial sense for many.

Our analysis, however, shows that the picture is more complex than previously thought. When we compared unshared, owner-occupied houses, we found that London still performs much worse than the national average. Furthermore, outer London, which is characterised by the kinds of properties that perform well in other regions, has a much lower solar PV capacity than inner London, when comparing those

homes on a like-for-like basis. As part of its forthcoming "London Energy Plan" the GLA needs to understand why London continues to underperform, and how its various housing sectors can increase their solar PV capacity.

What can the Mayor do?

We recognise that the speed of solar PV deployment in London is largely determined by factors outside the Mayor's direct control. Nevertheless, he can seek to influence Londoners and the Government by providing political leadership and promoting solar PV where possible. We are pleased that solar PV has recently become a greater priority for the Mayor's RE:NEW energy efficiency programme, but we think that more needs to be done.

London should look to New York City's attitude and funding approach towards solar power – it aims to increase its domestic solar PV capacity by a factor of eight over the coming decade. The next Mayor could promote innovation in solar PV technology more effectively and establish London as a leading centre of urban solar PV. He could make a start by increasing solar PV installations across the GLA estate and on GLA-funded housing. This can encourage other organisations as well as households to follow suit.

The next Mayor will benefit from work currently being undertaken by the GLA to produce the "London Energy Plan". We recommend that this document should clearly detail the expected renewable energy mix for London by 2025, and set out possible means to ensure solar PV meets its share.

The Mayor and the GLA can be of particular assistance in tackling the barriers currently faced by community energy schemes and housing associations. Solar PV can be installed much more efficiently on larger estates than on individual households. It can therefore be targeted to benefit low income households that might otherwise not be able to afford the up-front installation costs. Mayoral policy on solar PV can do more to help reduce fuel poverty in London. We urge the GLA to set out options that specifically target and support community energy schemes and housing associations in its "London Energy Plan".

This report represents the view of a majority of the Committee. The GLA Conservative Members' dissenting views are set out in a minority opinion in chapter five of this report.

1. Background

Key issues

Domestic solar photovoltaic (PV) power in the UK has enjoyed a boom in recent years through a combination of Government support, rising electricity prices, and falling installation costs. It also has an important part to play in the drive to reduce carbon emissions and to increase renewable energy production overall. Yet, compared with other parts of the UK, London generates relatively little electricity from small-scale domestic solar PV systems. As things stand, London lost out on at least £50 million of government subsidy for PV solar power on domestic homes in recent years and greater solar PV generation would also have cut London's CO_2 emissions.

There are challenges to expanding solar PV, some of which are more significant in London and urban areas than in other places. The national policy framework regulates and influences solar energy generation in London but recent changes in policy direction and subsidy levels for solar are threatening further expansion.

The Mayor can contribute to the development of renewable energy generation in the city by providing strategic policy direction and leadership; through his planning powers; by offering staff resources and project advice; and by lobbying for stable, predictable subsidies and policy.

1.1 Domestic solar photovoltaic (PV) power is an increasingly popular source of electricity in this country.[1] Once installed, it provides electricity with zero emissions, and – because it is generated locally – it reduces the demand on the distribution network and the losses of electricity in transmission. It forms one part of the UK's energy mix, and helps reduce dependence on foreign sources of energy. It is also versatile and scalable, with deployment possible on domestic, civic and commercial buildings, as well as on larger solar farms.[2]

1.2 Domestic solar PV is getting cheaper to install. The cost of installing a home system has fallen by 65 per cent from 2010-2014 and now ranges from approximately £4,000 - £6,000. And domestic solar PV is also popular with the public – over 80 per cent of the UK public support solar energy and would like to see more solar panels in their local area.[3] The latest results of the Department for Energy and Climate Change's (DECC) public attitudes tracker show that solar continues to be the most popular of all energy generation technology in the UK, with 81 per cent of those surveyed in 2015 expressing support for solar energy.[4]

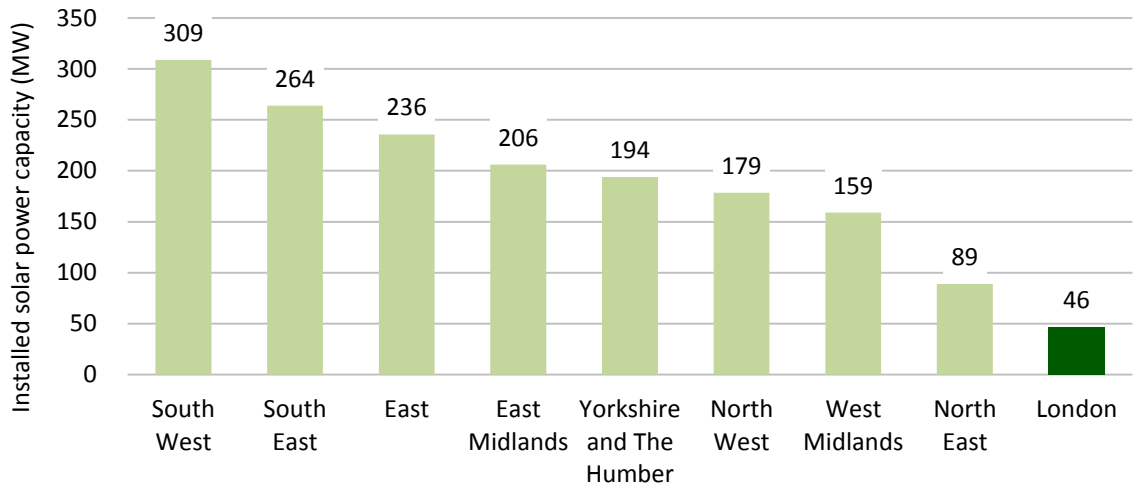
1.3 Many people are attracted to the financial savings solar PV can provide over the long term, while others are motivated by environmental concerns – a four-kilowatt system would save 1,400 kilograms of carbon dioxide (CO_2) per year. People with solar PV benefit from lower electricity bills, and they can generate an income from selling

excess electricity back to the national grid - yet we see significantly fewer solar panels installed on homes in the capital than in the rest of the UK.

London's performance

1.4 Compared with other parts of the UK, London generates relatively little electricity from solar power. It has the lowest amount of installed solar power capacity of any region in the UK, despite being the most affluent and populous part of the country, and having a favourable climate by UK standards.

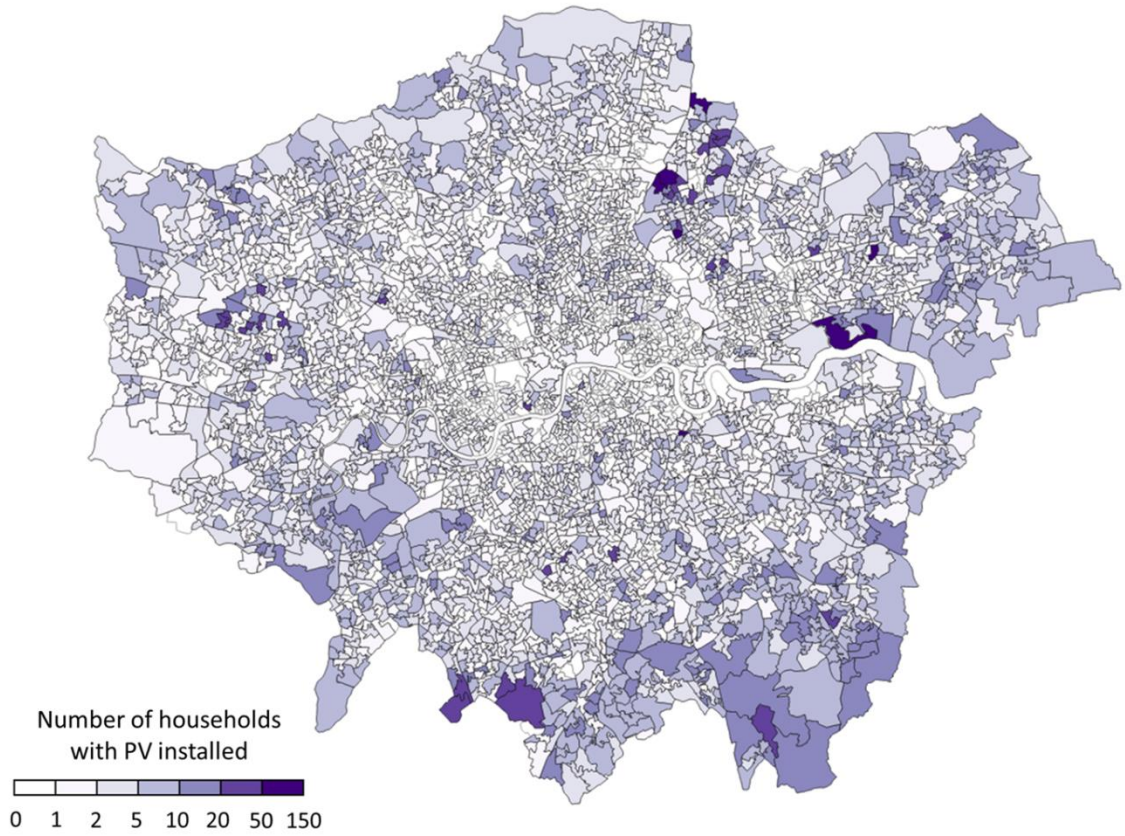
London had the least domestic solar PV capacity installed between 2010 and April 2015 of any region in England



London Assembly analysis of Ofgem and Census data[5]

1.5 It is obvious that London could generate more of its electricity from domestic solar PV. The GLA estimates approximately 50 per cent of roofs in London could be suitable for solar PV panels. Yet, as the map below shows, large parts of London have almost no solar PV installed and there is huge variation within as well as between boroughs. Solar panels are currently installed on fewer than 0.5 per cent of the city's 3 million homes and provide just 1 per cent of London's electricity needs.[6] The GLA estimates that London has the potential to supply up to a fifth of its electricity needs from solar PV.[7]

Large parts of London have few or no solar PV installations



(the areas here contain, on average, 600 households)

Source: Imperial College London and the 'EPSRC funded PV2025' project

Consequences of low solar PV generation in London

1.6 We estimate that London's low solar PV installation meant that households lost out on approximately £50 million of Feed-in Tariff (FiT) payments between 2010 and 2014. Only 2.5 per cent of the £850 million of FiT subsidies collected by households across England and Wales went to London, despite it having 14 per cent of households and 8.5 per cent of its unshared housing stock (removing all shared accommodation, flats and apartments). If London had received the national average of FiT subsidy based on its share of suitable housing stock, it would have received some £72 million, rather than the £22 million it actually received.

1.7 Greater solar PV generation would also have cut London's CO_2 emissions. The Mayor has set a target to reduce London's carbon dioxide emissions by 60 per cent of 1990 levels by 2025. If London had seen the same level of domestic PV solar take-up as the rest of the UK, then it would have generated almost 200,000 MWh more electricity from solar over a four-year period, and with this saved almost 100,000 tonnes of CO_2 equivalent (assuming the energy otherwise came from fossil fuels).[8]

London's challenges

1.8 The outlook for London's domestic solar PV is largely dependent on the national policy framework set out by the Government. Many experts fear that recent and proposed changes in national policy direction and subsidy levels will dramatically slow the recent boom in domestic solar PV. Catherine Mitchell, a professor of energy policy at the University of Exeter, said the Government wanted a sustainable, secure and affordable energy system but had introduced policy changes that took the UK away from that goal.[9] Some of these issues are discussed further in chapter three.

1.9 During our investigation we have also heard that London faces some unique challenges in increasing its solar PV capacity:

- a cityscape of thin, tall buildings as well as terraced housing with little roof space;
- a lower proportion of owner-occupied homes with more than 50 per cent of households renting and, therefore, a more transient population;[10]
- lower appetite for solar technologies and a lower level of interest among householders for investing in renewable energy.

1.10 Overcoming these barriers will require determined leadership and support from the Mayor and GLA over the years to come. The focus should also be on reliable financial support programmes, targeted policy and performance approaches, and London-specific resources for information and advice. Details are set out in the following chapters.

The role of the Mayor

1.11 Domestic solar PV is an important part of the Mayor's plans to increase London's renewable energy capacity and cutting its CO_2 emissions. In his 2011 Climate Change Mitigation and Energy Strategy (CCMES), the Mayor set out targets to generate 25 per cent of London's energy by local and renewable sources, and to cut CO_2 emissions by 60 per cent in 2025 compared to 1990 levels. Failing to increase domestic solar PV generation will put more pressure on generation from other renewable sources in London, such as wind, biomass fuelled heating, or combined heat, power and cooling, if the Mayor is to reach those targets. The Mayor has not set a specific target for solar PV generation on the basis that a mix of renewable energy sources is needed, and the balance of that mix will change over time.

1.12 The Mayor is keen to move as much of London as possible away from reliance on the national grid and on to a local, low and zero carbon energy supply and has a number of ongoing programmes and activities to achieve this. These include retrofitting schemes for homes and public sector buildings (RE:NEW and RE:FiT), and a decentralised energy programme, as well as delivery through the London Plan – which requires larger developments to generate decentralised renewable energy on site. And through his planning powers, as they relate to major planning applications for new development,

the Mayor also has direct control over the implementation of his strategic policies and his goal to deliver greater levels of locally-generated renewable energy.

1.13 The GLA is now also developing the 'London Energy Plan', a spatial map of London's energy supply and demand to 2050 with options for the required supporting infrastructure. The Plan will include projections of heat and electricity infrastructure, retrofitting of the built environment to reduce demand, and electrically-powered transport. This includes a review of London's potential for small scale decentralised energy. Further information is expected at the end of the year.

Scope

1.14 This investigation has focussed on solar generation from London's homes, which make up a significant proportion of London's surface area available for solar PV.[11] Maximising solar energy production from households is therefore vital for achieving the objective of generating 25 per cent of London's energy needs from local, low carbon sources by 2025.

1.15 The investigation adopted the following terms of reference:

- To set out the current landscape of solar energy generation in London, within the national context.
- To examine how effective the Mayor's RE:NEW programme has been in promoting and implementing domestic solar energy generation in London.
- To understand the opportunities and challenges for developing more solar generation from London's homes and explore the role of the Mayor for engaging in this.

2. Confronting housing and planning barriers

Key issues

Housing tenure is a key factor in whether solar PV is likely to be installed in London. Owner-occupiers are more likely to install solar PV than landlords or tenants in the private rented sector because they stand to receive all the financial benefits.

Solar PV uptake is likely to be slowed by changes to national planning policies, such as the abandonment of the plan to make all new homes zero carbon. The Mayor and local authorities can still, however, attempt to increase solar PV installation through their own planning policies and guidance. Many home owners as well as planning professionals are unsure whether planning permission might be required for renewable energy technologies like solar PV, or if it can be installed in London's conservation areas at all.

London's low level of solar PV capacity is commonly blamed on the tenure and design of London's housing stock. Our analysis shows, however, that this is not the whole reason. Even when we compare unshared, owner-occupied houses, London performs much worse than the national average. We have also found that outer London has much lower solar PV capacity than inner London, when we compared those houses on a like-for-like basis. The GLA needs to investigate this further to ensure that outer London's potential is not being wasted.

Ownership and roof space

2.1 Housing tenure is a key factor in whether solar PV is likely to be installed. The GLA needs a range of solutions tailored to the different tenures and providers across London. These include:

- Homeowners
- The private rented sector
- Housing Associations and social landlords
- Community energy schemes

Homeowners

2.2 Installing solar PV has been most popular among London's 1,576,000 homeowners.[12] This group tends to live longer in the same property, and therefore has the best chance of recouping the cost of the system over the following years and generating a profit. Homeowners also tend to live in properties that are most suitable for rooftop installations – houses rather than flats or apartments. There is also some evidence that installing solar PV can increase the value of the home. According to DECC, improving a property's EPC rating by two bands – not unusual with solar PV – could add more than £16,000 to the sale price of the average property in England.[13] Homeowners are therefore considered the 'low-hanging fruit' in terms of the effort required to increase

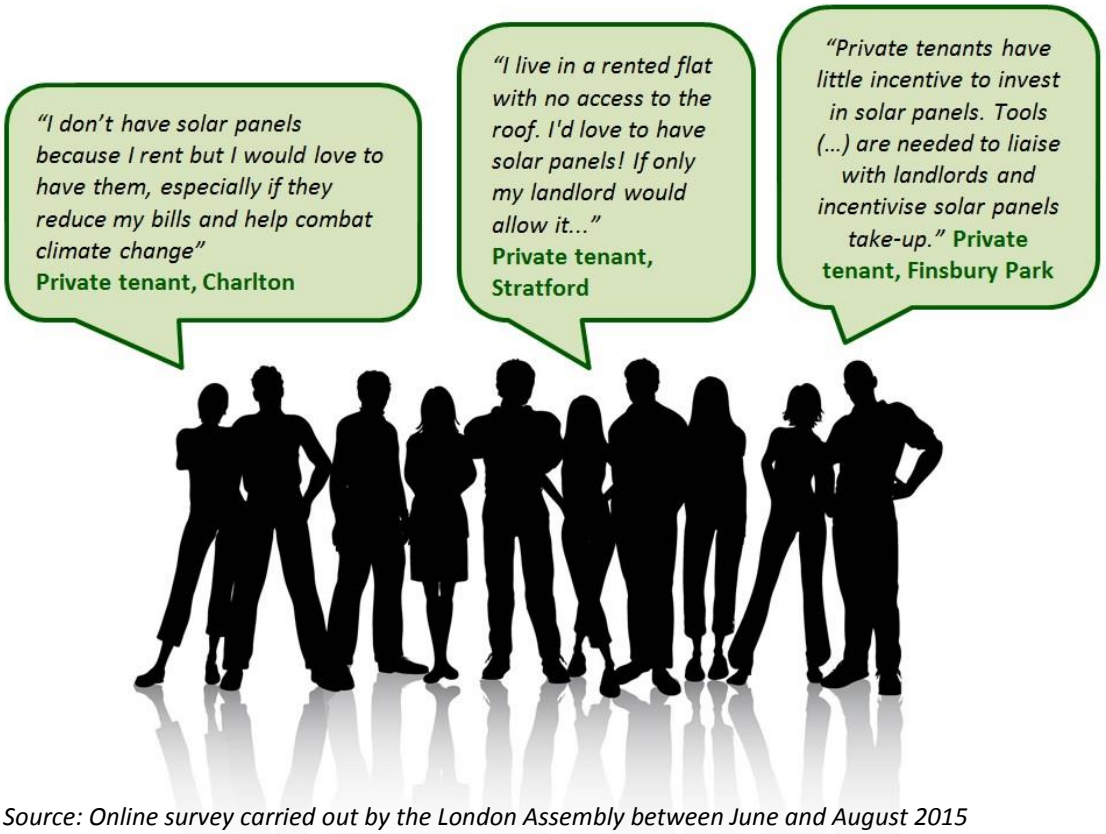
take-up of solar PV in London. As we discuss later in this chapter, however, London has less solar PV capacity installed per unshared, owner-occupied home than any other region in the UK. There is clearly scope to improve London's record in this sector.

The private rented sector

2.3 Increasing the take-up of solar PV in the private rented sector has been far more difficult. The main barrier is that, while the cost of installing a system would fall on the landlord, they would not receive the main benefit of solar PV – the lower electricity bills. The landlord *would* benefit from any increase in the value of the property and would also receive the FiT tariff payment, but (as we discuss in chapter three) FiT payments are expected to fall significantly in the near future.

2.4 Understandably, solar PV is popular with tenants. The Energy Saving Trust told us that 76 per cent of tenants interviewed said they would choose a property with a solar system over one without.[14] This is unsurprising; many of London's households that are renting would enjoy lower electricity bills without having to meet the up-front costs of installation.

Solar PV is popular with tenants across London



Source: Online survey carried out by the London Assembly between June and August 2015

Housing Associations

2.5 Solar PV is very popular with housing associations. These organisations own large areas of roof space that are ideally suited to solar PV installations, and are willing to invest for long-term benefits. According to a recent survey, 82 per cent of housing associations in the UK said that solar PV was the main renewable energy technology used on new developments. Collectively, the 174 housing associations surveyed had installed solar PV on more than 16,500 new homes since 2006.[15] In London, for example, Ascham Homes has delivered solar installations on over 1,000 of its properties in Waltham Forest, the largest solar scheme of its kind in the capital.

Community energy

2.6 Community energy – where citizens own or participate in the production and/or use of sustainable energy – is currently relatively small in the UK, but has great potential to expand. According to DECC, 42 per cent of people surveyed said that they would be interested in taking part in community energy if it meant they would save money on their energy bills.[16] In London, a small number of solar energy schemes are currently run in the boroughs of Lambeth and Hackney.

2.7 Community energy schemes are particularly worthwhile because of the wider social benefits they offer. They can contribute to community cohesion, create employment opportunities, generate revenue and combat fuel poverty. Community ownership and participation in renewable energy projects can also help to generate public support and acceptance for renewable energy projects more widely and reduce local opposition.[17]

Community energy in Brixton

Repowering London, a non-profit organisation, has installed solar PV on three council estate projects in Brixton. It reached an agreement with Lambeth Council to lease the roofs of the buildings of these council estates. Surplus money goes towards measures to reduce cold draughts from windows and doors, energy efficiency improvements and education initiatives. Afsheen Rashid-Kabir, Chair of Repowering London told us that:

"One of the key elements (…) is around skills, employment and training that in the green economy the solar installation industry provides. That has been a major draw for us in getting people involved and engaged in our projects. We have been offering internships and work experience for young people and residents who are unemployed and who are looking for jobs on our schemes."

Recommendation 1

The GLA's forthcoming London Energy Plan and any subsequent Energy or Environment Strategy should set out options for increasing domestic solar PV under different tenures, paying particular attention to landlords in the private rented sector including ways to engage with landlords and developers.

RE:NEW

2.8 RE:NEW – the key Mayoral programme to improve energy efficiency in the home – has had some success in encouraging domestic solar PV installation. Since 2009-10, the Mayor has spent £12.6 million on RE:NEW programmes. This has supported the installation of solar PV in some 4,300 homes (usually as part of a wider package of

home improvements). Looking at the pipeline of projects, up to 6,700 homes could benefit from solar installations in the current programme phase; some of these projects are yet to be financed so these numbers are subject to change.[18]

2.9 We are pleased to see that the RE:NEW programme is now focusing more on solar PV. In October 2014, it established a specific solar workstream with a dedicated project manager, supported by a team of RE:NEW engagement managers and wider support team resources. The RE:NEW Support Team has been helping organisations, such as local authorities and housing associations, to quantify the costs and returns of solar and to shape bespoke solar programmes for their stock. In addition, a new RE:NEW framework of suppliers is currently being procured, which should make it easier for social landlords to install solar PV.[19] As we set out in chapter four, however, there is more that the Mayor and the GLA could do through RE:NEW or a similar programme.

Planning policy and regulations

2.10 Recent changes in national planning policy may reduce the incentive for developers and owners wanting to improve their homes to install renewable energy technology, including solar PV. In March 2015 the Government stated that local planning authorities should no longer seek carbon dioxide savings beyond Code for Sustainable Homes Level 4 for energy. The Government has also stated that it will not introduce zero carbon homes in 2016. The EU requirement for new buildings to be 'nearly zero carbon' (by 2019 for government buildings and 2020 for all buildings) remains unchanged.

2.11 Major housing developers said the decision to abolish a decade-long plan to force all new homes to be 'zero carbon' from 2016 was extremely disappointing, a view that was echoed by over 200 businesses from the construction, planning and renewables industry.[20] Planning requirements in London (and nationally) are what drives developers and housing associations to incorporate renewable energy sources in new developments. The Government's recent decisions are therefore likely to have a negative impact on future installations.

2.12 The Mayor can still influence the installation of solar PV on new developments through his London Plan, which includes carbon dioxide reduction targets and requires major developments to generate decentralised renewable energy on site, for example with wind turbines, or solar panelling. His new Sustainable Design and Construction Supplementary Planning Guidance also sets out specific priorities in sustainable design and provides guidance for local authorities and neighbourhood planning to promote renewable energy in their area. The London Plan sets long term strategic climate change targets for London as a whole in order to meet national carbon reduction targets.

2.13 Local authorities can promote solar PV uptake through their own planning regulations. Hackney is currently consulting on a draft Sustainable Design and Construction Supplementary Planning Document (SPD) in an attempt to mainstream sustainability in the developmental design process. The idea is that the document is used by all parties

involved in the development process, from initial design through to construction and final delivery of the building, and that it provides strategic level guidance as a starting point for discussion between the applicant's design team and the Council.[21] Under the SPD, and in line with guidance issued by the Energy Saving Trust, the Council would expect 10 per cent of the cost of a domestic refurbishment or extension to be spent on environmental measures, such as insulation or renewable energy technology. Other councils, such as Camden, also use this approach in their own planning guidance.

Planning permission and conservation areas

2.14 Confusion about whether solar PV panels require planning permission may be putting some people off installing them. In most cases, fixing solar panels to a domestic roof or wall is likely to be considered permitted development under national planning law, which means there is no need to apply for planning permission.[22] But research carried out by the GLA in 2013 found that many survey respondents did not understand when planning permission might be required for renewable energy technologies, or if it was likely to be granted. To address this, the London Borough of Camden, for example, has produced 'retrofitting planning guidance' that clearly sets out the planning and building control procedures that people will need to follow in relation to a range of energy efficiency technologies, including solar PV.

2.15 There is further confusion regarding whether solar PV can be installed in conservation areas – a real issue in London which has more than 1,000 such areas. In fact, the conservation area designation makes little difference to whether planning permission is required for roof-mounted panels.[23] Permission is only needed for certain if the building is listed. Clarifying this position could give confidence to homeowners thinking about installing solar PV in a conservation area. In addition to its 'retrofitting planning guidance' the London Borough of Camden has created 'energy efficiency planning guidance' for two of its conservation areas. This sets out what measures are likely to be considered appropriate and what would be required in any planning applications.

Recommendation 2

The GLA should only permit major developments where solar PV technology is included in the design or as a planning condition. This can be achieved through amendments to London Plan policy, reflecting planning changes that also make it easier to permit solar PV in conservation areas, and by applying this both to new build and retrofit proposals.

As borough policy has to be in conformity with the London Plan, this should also have an impact at local authority level and with homes and developments of all sizes. We encourage London boroughs to provide additional policy direction through SPDs following the approach of local authorities like Hackney and Camden.

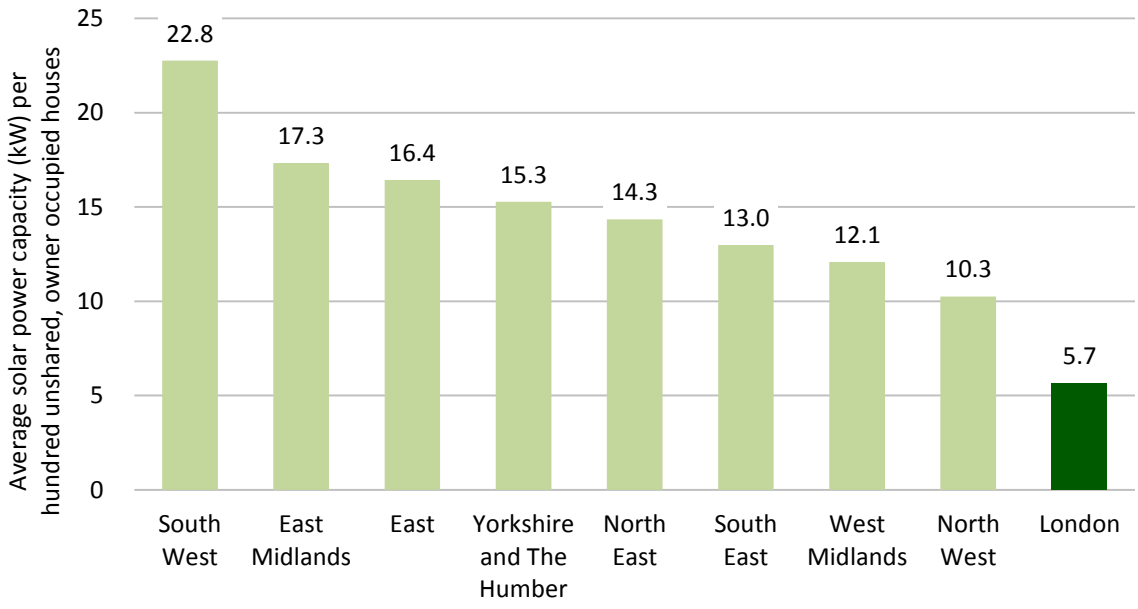
Recommendation 3

More generally, the GLA should continue to use appropriate planning conditions in major planning applications to maximise the contribution that on-site renewables such as solar PV can make, in light of recent changes to Housing Standards. This would be particularly relevant in GLA-funded schemes where the GLA could set specific delivery goals for solar power as part of the deal.

Is London really a special case?

2.16 Our analysis shows that some of the reasons usually given to explain London's low levels of domestic solar PV do not stand up to scrutiny. London does indeed have a high proportion of flats and rented properties, making much of its housing stock less suitable for rooftop installations. But, as the chart below shows, London has much lower installed solar capacity than other regions *even when only unshared, owner-occupied houses are considered*, which make up around 51 per cent of London's housing stock.[24]

London has less solar PV capacity installed per unshared, owner-occupied home, than any other region in England



London Assembly analysis of Ofgem and Census data[25]

2.17 Our analysis also reveals that *outer* London boroughs have installed less solar PV capacity than *inner* London boroughs, per unshared, owner-occupied dwelling. In outer London, each 100 unshared, owner-occupied dwellings compared has 4.7kW of solar PV capacity. In inner London, this figure rises to 9.0 kW. It is not clear why there is such a discrepancy between inner and outer London, and this is an issue that the

GLA could usefully investigate. London's overall average of 5.7kW lags far behind the UK average of 14.5 kW.[26]

Recommendation 4

The GLA should conduct research that would examine in greater detail the reason for the capital's poor performance, particular evident in the outer boroughs, in generating electricity from its residential rooftops. This could be done as part of or following the work on the London Energy Plan. The results will help the Mayor draw up more effective solar policies within his Environmental Strategy and the London Plan.

3. Understanding financial barriers

Key issues

One of the main barriers to installing solar PV is the overall installation cost. Many stakeholders note the high costs from retrofitting solar panels on buildings in London. Prices are an important factor in decision-making for homeowners, social housing providers and landlords. The cost of installing solar panels, which has fallen considerably in recent years, can be recovered over a number of years as owners benefit from reduced energy bills and government subsidy (the Feed-in Tariff), but this incentive is due to be reduced or eliminated in the near future. Uncertainty over the FiT, and renewable energy policy more widely, reduces investor confidence and is expected to inhibit even greater uptake of solar PV. The Mayor should do what he can to protect London's solar PV market from these factors.

3.1 One of the main barriers to installing solar PV is the up-front cost. While this has been falling in recent years, it is still a significant investment for many, ranging from approximately £5,000 to £8,000 (including purchasing the panels and employing a contractor to install them). In deciding whether to install solar PV, individuals must balance those up-front costs with the longer-term financial benefits, as well as the wider environmental benefits that will result.

3.2 The costs of PV installation are slightly higher in London compared with other UK regions, but this is not thought to be a significant factor in household decision-making. It can be more complicated to install solar PV in London because of factors like crowded or small roof spaces, parking restrictions and the congestion charge, and this is in some cases reflected in higher installation costs. Some installers have told us that they don't charge a premium in London and the main impact is on installers themselves in having to make the necessary arrangements.

3.3 Calculating the financial benefits is complicated, and subject to a number of uncertainties. The main attraction of domestic solar PV is the ability to make savings on household electricity bills. For an average solar PV installation, this could save around £135 a year in London, but electricity prices are liable to change, and have been falling since they peaked in February 2014 – savings from solar PV have therefore also fallen. Households with solar PV can also sign up to receive a financial subsidy through the Government's Feed-in Tariff (FiT) system. This is currently worth approximately £570 per year (£475 from the generation tariff and £95 from the export bonus).[27] Taking into account the electricity bill savings and the FiT income, the average solar PV installation could currently pay off the up-front costs after 8-10 years.[28] The current proposals to the generation FiT would extend the payback period to 20 years with a minus 1.7 per cent annual rate of return.[29]

Feed-in Tariff

The FiT scheme is funded from small surcharge on household energy bills. According to DECC, this was worth £9 on top of the average yearly dual fuel household bill of £1,369 in 2014.[30] It offers guaranteed payments to households that produce their own electricity at home using renewable technologies, such as solar PV panels or wind turbines. Its intention was to encourage households, businesses or community groups to generate small-scale, low-carbon electricity. These 'generators' receive a generation tariff for electricity generated and an export tariff for surplus electricity going to the local grid. 750,000 households are registered for the FiT scheme, largely for solar PV; DECC had not expected to reach this level until 2020 or to exceed the original £7.6 billion cap set out in the Levy Control Framework - the budget for the subsidies for renewable energy deployment. FiT payment tariffs were calculated to give generators a 4.5 per cent annual return on their investment. As the up-front costs have fallen, so the FiT rates have fallen to keep that rate of return broadly stable, and to control the cost of the subsidy to other electricity bill payers.

3.4 Uncertainty over the future of the FiT regime is a significant factor in deterring people from installing solar PV. A 2011 survey found that, despite solar PV being homeowners' favoured renewable energy technology, many have delayed or abandoned installing a system as a result of past and expected cuts to subsidy.[31] This also seems to be the case with many housing associations that operate more long-term and strategic investment plans. The Government is now consulting on a set of measures to manage the cost of the scheme, and is expected to announce its decision by the end of the year. The Government is required to review the FiT scheme performance every three years, as part of the EU state aid approval arrangements for the scheme.

The Government's FiT review

3.5 In August 2015, the Government launched a consultation on the future of the FiT scheme. It included proposals to reduce tariff values (from 12.4p to 1.6p p/kWh), and introduce a more stringent degression mechanism and deployment caps leading to the phased closure of the scheme to new entrants in 2018-19. If these measures are not enough to control the cost of the scheme – funded through adding an extra £9 to the average electricity bill in 2014-15 – generation tariffs would be closed to new applicants as soon as legislatively possible.[32] This could be as early as January 2016.[33]

3.6 Many stakeholders are very concerned about the impact of the Government's current proposals to reduce or end FiT generation payments. According to Philip Sellwood, Chief Executive at the Energy Saving Trust:

"Our calculations show that, given current prices for this technology, under the new proposed Feed-in Tariff rate a standard solar PV installation is no longer cost effective for householders. Based on the new rate, the price of a typical solar panel installation

will need to fall by over £800 for an investment in this technology to be cost-neutral for a typical home."[34]

3.7 The Solar Trade Association (STA) believes that the proposals would be hugely damaging for the UK solar industry. Frans van den Heuvel, CEO at Solarcentury, added:

"If the consultation is enacted, we can expect to see a wholesale collapse in solar take up by homeowners and businesses - just at a point in time when most other countries are escalating their solar deployment having seen the dramatic impact the technology can make in tackling climate change."[35]

3.8 Indeed, the Government's own impact assessment for the FiT consultation notes that the proposals "may result in significantly reduced rates of deployment" as well as a negative impact on renewable energy jobs.[36] The STA expects as many as 2,190 of London's 2,740 solar jobs will be lost.[37] Most recently, at the start of October, one of the UK's leading solar panel installers went into administration.[38] The Government, however, believes the solar industry should be able to cope as it has "proven resilient to previous significant changes to FiTs, and has been able to adapt to tariff reductions and the introduction of degression". Experience has shown that the sudden cut in 2012 created a boom and bust that was damaging to businesses and jobs and created an impression in the consumer market that it was 'too late to go solar'. These latest proposed cuts are expected to be far worse.

3.9 Investment decision making on larger community solar PV projects has also been made more difficult by another recent policy change. In September, the Government decided to end the FiT pre-accreditation mechanism for solar projects above 50kW – particularly relevant to community energy schemes. Previously, investors could register their solar PV projects up to six months before completion, giving them certainty over the level of FiT they would receive. From 1 October this will no longer be possible, making it much more difficult for would-be developers to decide whether solar PV would be a viable investment. The Renewable Energy Association notes that the internal processes required by organisations such as community, school and local authority projects make it virtually impossible to commit to renewable projects if future rates are uncertain. The prospects for solar PV can only be damaged by such uncertainty.

3.10 At a recent climate leadership event, John Cridland, Director General of the CBI, stressed: *"Today's investors are more uncertain about the UK's low-carbon future. From the roll-back of renewables to the mixed messages on energy efficiency, these changes [by the Government since coming to power] send a worrying signal about the UK as a place for low-carbon investment."*[39] He was supported by former vice president of the US, Al Gore, who has called on the British Government to resume its former leadership on climate change. Gore said he could not understand the rationale for government measures to roll back support for renewable energy, while climate change presents a clear danger to the UK and the rest of the world.

Low Carbon Alliance and Origin Housing

Many housing associations and Registered Social Landlords have reported that they have had to delay or abandon planned schemes to install solar PV on their properties due to earlier changes to the Feed in Tariff or concerns over potential future changes that would affect finance models. For example, the Low Carbon Alliance (LCA) has worked with London-based social housing provider Origin Housing, identifying the potential for 3.9MW of solar PV across its housing portfolio. LCA have arranged for over 500 PV systems to be supplied and installed for free, providing Origins tenants with free electricity. The panels should have been installed this summer, but uncertainty over the Government's intentions on the future of the FiT has delayed the project.

3.11 Many stakeholders argue that FiT levels for new installations and degression triggers should be *steadily* reduced over the coming years. This would give households and the solar industry the certainty needed to plan their investments and at the same time protecting bill payers from any undue costs. They argue that closing the FiT scheme for new installations will not *cut* electricity bills since the FiT costs are from contracts on existing installations. The STA estimates that 2.1 million homes (up from the current 750,000) could have solar PV installed by increasing the current £9 spend on annual household bills to £13.35 in 2020, thereby providing 7 per cent of Britain's electricity demand.[40] From this point onwards, all residential rooftop solar installations would not add any *extra* cost to electricity bills.

3.12 A recent KPMG report argues that the Government needs to craft "a transition away from subsidies over a five-year period and beyond, rather than the immediate cessation of support, that will result in job losses and industry consolidation".[41] This chimes with what Seb Berry, Head of Public Affairs at Solar Century, told us:

"Nobody in the solar industry has ever argued that FiTs should stay in place forever and a day for new installations. We are absolutely committed to working with the Government to get out of the need for FiT support for new installations as quickly as possible. [The new Government] has a great opportunity, actually, to work with us to manage this transition out of FiTs by the end of this Parliament, which is a very realistic plan. If we can do that in a sensible way, it will make [solar] the first renewable technology to be able to stand alone, particularly for on-roof projects, with no need for additional FiT support at all in five years' time. However, it has to be done properly and transparently."[42]

3.13 Similarly, Andrew Bonfield, Financial Director of National Grid, called for more strategic thinking from government, saying that his company had to think five decades ahead about its plans, and would like government to send clear signals for long-term policy development. He predicted that within two years, solar power could be as cost-efficient as fossil fuels.[43]

3.14 The Government's FiT review has attracted much criticism and is seen as simply another barrier for would-be solar generators in London. The Mayor of London, Boris Johnson, is also concerned about potential cuts to the FiT. He said at Mayor's Question Time in September: *"I think it would be wrong if the cut in the Feed-in Tariff actually stops people from investing in solar, because clearly it has many, many attractions".*[44] We agree with many stakeholders that cutting FiT rates and imposing much tighter caps on overall subsidy (through the degression mechanism) risks damaging the solar industry in the UK just as it is about to reach the threshold of grid parity – that point at which consumers can generate solar PV electricity at the same cost as they can buy electricity from the grid. We therefore believe that the Mayor should lobby the Government to ensure that subsidy for solar PV is gradually reduced to zero when grid parity is achieved.

4. Developing Mayoral leadership and best practice

Key issues

The speed of solar PV deployment in London is largely determined by factors outside the Mayor's direct control. Nevertheless, he can seek to influence Londoners and the Government by providing political leadership and promoting solar PV where he can. Installing solar PV across the GLA estate, and on GLA-funded housing – can encourage other households to follow suit. And London could benefit from the attitude and funding in New York City, as it attempts to increase its domestic solar PV capacity by a factor of eight over the next decade. The Mayor and the GLA can be particularly helpful to community energy schemes and housing associations. Solar PV can be installed more cost-effectively here, and benefit low income households who would otherwise not be able to afford the up-front installation costs. Mayoral policy on solar PV could help address fuel poverty, and we urge the GLA to explore how it can target these sectors more effectively in its forthcoming "London Energy Plan".

4.1 The speed of solar PV deployment in London is, to a large extent, outside the Mayor's direct control; government policies, energy prices and wider economic conditions are likely to be more important factors than Mayoral policy. Nevertheless, we think that London's Mayor still has an important role in promoting solar PV. He can:

- provide political leadership;
- establish supportive renewable energy programmes that maximise potential of solar PV;
- make use of the GLA's own estate to showcase best practice;
- lobby for stable and predictable subsidies for industry; and
- determine London's solar needs.

4.2 The next Mayor will benefit from work currently being undertaken by the GLA to map out London's energy supply and demand to 2050. This "London Energy Plan" document will provide more detailed data and forecasts upon which to base future policy, and will also set out options for the renewable energy infrastructure London needs. The Plan needs to update and refine the previous technical assessment and deployment estimates for London's solar PV potential, and map out options to increase solar PV generation as part of London's mix of renewable energy sources for the future.

4.3 The Mayor and the GLA are starting to take action to boost solar PV in London, but we think that more could have been done sooner. As we noted in chapter two, the GLA established a dedicated solar workstream within its RE:NEW energy efficiency project

in October 2014. But this is just a small step, and the next Mayor faces a tough challenge to increase London's domestic solar PV and start catching up other regions of the UK. It is simply not acceptable for London to lag so far behind, and the next Mayor needs to make use of all the tools at their disposal to improve the capital's performance.

Demonstrating and trialling solar PV technologies

4.4 One of the most visible steps would be for the next Mayor to increase the installation of solar PV on the GLA Group's estate and any new housing built with GLA funding. As solar installers have noted, homeowners are more likely to install solar PV if it has already been fitted to neighbouring properties. Credit here is due to the London Fire Brigade (LFB), run by the London Fire and Emergency Planning Authority (LFEPA), which has installed 43 arrays of solar PV panels on its buildings so far.[45] By comparison, Transport for London (TfL) currently only utilises 11 solar arrays across its 300 TfL sites (excluding bus shelters) while the Metropolitan Police Services (MPS) has 20 solar arrays on its estate.[46] The Mayor can do more to encourage all parts of the GLA Group to install solar PV on prominent sites across London.

Solar PV arrays were installed on this fire station in Richmond in 2005

Source: Captured and Supplied by Bluesky International Ltd

4.5 The GLA's unique role and its influence on London's housebuilding market offers it a huge opportunity to get more solar PV installed on new homes in London. Since 2008-09, the GLA has part-funded the construction of 88,000 new affordable homes, most of which are flats and apartments.[47] These developments are obliged to have renewable energy technology installed, but not all of them involve solar PV. We would like to see the next Mayor show greater ambition and require *all* new developments to have solar PV installed, and increase the level of renewable energy produced on site.

4.6 The GLA should look at aligning their objectives and workstreams with the Solar Trade Association's 'Solar Independence Plan for Britain' which calls for a 'higher ambition

scenario' for 2020 which includes 2.1 million solar homes and 25GW of solar PV installed capacity.

4.7 The next Mayor could also do more to promote cutting-edge solar PV technology and establish London as a leading centre of innovative urban solar PV. Existing and emerging solar PV technologies, such as solar roof tiles, or vertical, flexible or shaped panels (known as "Building Integrated Photovoltaics"), are becoming increasingly popular. They are now viable alternatives to traditional roof-mounted systems, and can provide solutions to some of London's specific challenges. The GLA could support pilot projects to test and showcase new technologies and design on its own properties, and those new homes it funds.

Solar PV in New York City

In 2006, solar PV electricity capacity in New York City (NYC) was less than one megawatt (MW). Growth was being inhibited by the lack of policy, financial support and cooperation among key agencies and utilities. Over the past decade, NYC has joined with the City University of New York (CUNY), the U.S. Department of Energy (DOE) and others to increase its solar PV generation. This partnership collected detailed information about every single rooftop to create the NYC Solar Map.[48] This research showed that two-thirds of rooftops were suitable for solar installations, with the potential to generate half of the entire city's energy needs at peak times.

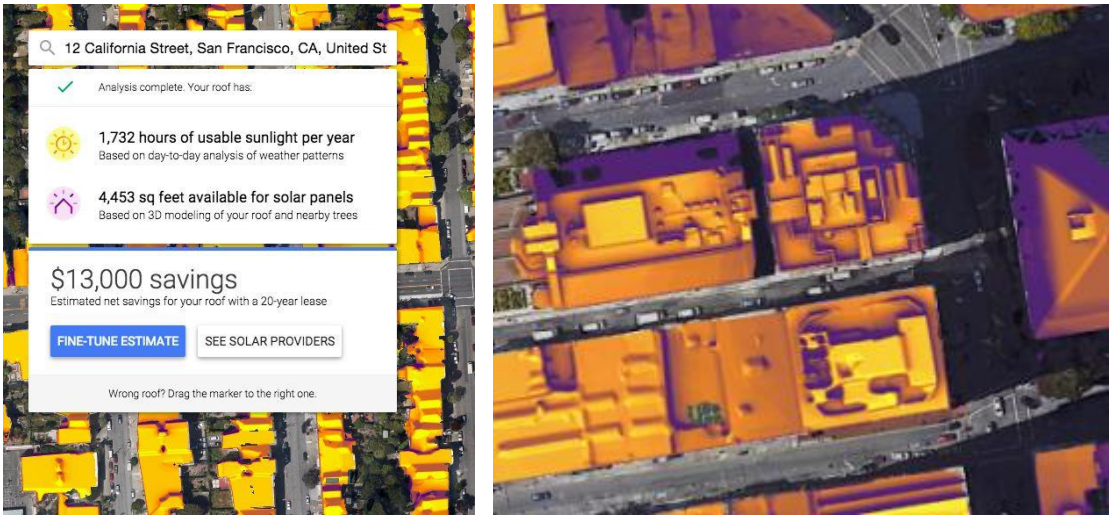
As of October, NYC installed capacity is 35.7 MW.[49] The goal now is to increase NYC's solar power capacity by 250 MW over the next ten years on privately-owned properties. The City funds the NYC Solar Partnership to provide assistance with granting permissions for solar installations, coordinating solar projects between City-owned properties and other entities, connecting installers and their customers to financing and incentive opportunities, and providing installers, businesses, and residents with educational resources to help accelerate investments in solar power.

4.8 When looking for inspiration, the next Mayor could do worse than look to New York. Its Governor, Andrew Cuomo, has announced a $1 billion programme for solar over the next ten years. The London Sustainable Development Commission (LSDC) is currently exploring the creation of a 'Tall Buildings' competition (potentially between London and New York), which is expected to have a solar component. If realised, this could be an opportunity to learn from other cities and highlight London's potential at the same time.

4.9 In order to provide an accurate picture of London's solar PV potential, we think that a similar project to the NYC Solar Map might be needed. Detailed elevation data has already been collected by the Environment Agency and is now available as Open Data for anyone to use. We hope the GLA will help community groups and others to make the most of this data, which could help to cost-effectively identify sites suited to solar PV. In the United States, Google has launched its "Project Sunroof" tool in three urban areas, which calculates solar PV potential taking into account not only roof orientation,

but also shading from vegetation and buildings.[50] Consumers can also input their typical electricity costs to calculate how much money a solar PV system could save them, and find out contact details for local installers plus learn about financing options. The Mayor should liaise with Google to explore whether this tool could be rolled out to London in the near future.

Google's Project Sunroof tool provides information about the solar PV potential of individual homes in some parts of the United States



Source: Project Sunroof website[51]

Recommendation 5

The Mayor should lobby the Government against its proposals to cut the FiT by 87 per cent, setting out the impact of these proposals on London in terms of solar PV deployment and solar jobs. He should argue for greater stability in solar PV policy, and gradual, predictable reductions in subsidies until at least grid parity is reached. He should also press the Government to restore the 'pre-accreditation' mechanism which helped community energy projects to manage longer lead times and to secure financing based on guaranteed rates.

Recommendation 6

The GLA's forthcoming London Energy Plan should clearly detail the expected renewable energy mix for London by 2025, and set out possible means to ensure solar PV meets its share. To do so, it should set out early priorities and a capacity target based on deployment potential. This will send a clear signal to the market that there is a major opportunity in London.

To support this, the technical and deployment potential for solar PV in light of technological development and falling prices must be comprehensively reviewed to ensure the actual potential for London is recognised.

Recommendation 7

Beyond the London Energy Plan, the Mayor's office should aim for higher ambition scenarios, setting out a timeline for developing a coherent, strategic direction with the view of making London one of the leading world cities for solar PV and for driving innovation. This is a separate work stream that also needs to be incorporated into the forthcoming London Energy Plan and any subsequent Energy or Environment Strategy.

More generally, the Mayor should engage more actively in developing policies for maximum capacity PV deployment, showcasing and promoting best practice and good examples of using solar PV in urban areas, for example by generating PV derived electricity from the TfL and wider GLA estate for London transport operational needs. This would increase awareness among housing providers and owners as well as other sectors and give them confidence to follow through with planning for or retrofitting solar panels.

Supporting community energy schemes

4.10 The Mayor and GLA can do more to encourage larger scale, community-based solar PV schemes. Crucially, they also benefit lower income households, thereby helping to tackle fuel poverty. Because of the high up-front costs for domestic solar PV (and the need for a certain area of roof space), it is out of reach for many lower income households in London. These are the very households that would benefit most from lower electricity bills. And because projects at this kind of scale (potentially involving hundreds of homes) benefit from significant economies of scale, they can provide better value for money than installing solar PV on individual homes. Any funding the GLA could provide would therefore go further. We think that housing associations and community schemes should be key solar PV priorities for London's Mayor.

4.11 During this investigation, we have heard about the barriers that housing associations and community schemes face when considering solar PV. The most challenging issues are the shortage of expertise (financial, legal and technical) to guide a project from inception to completion, and the lack of secure, long-term funding needed to pay the staff required. There are also difficulties in securing opportunities to lease public roof

space from local authorities.[52] The overwhelming majority of London boroughs are not currently offering energy community groups the opportunity to lease civic roof space for community share energy schemes, even where local authorities have no plans to install solar panels themselves.

4.12 We do not have all the answers; we suggest the GLA explores these issues with stakeholders as part of its work to develop the London Energy Plan. Repowering London, for example, has called for the GLA to establish a voluntary framework that would require developers to offer community energy groups the right to buy a certain proportion of new solar PV systems on new-build developments. We have heard that community schemes would be able to deliver more solar PV more quickly if centralised or project-based support became available. The RE:NEW scheme can offer some help to participating organisations – there may be scope to expand this role.

4.13 Some stakeholders have called for a pan-London "one stop shop" for information, advice, funding and installation.[53] Creating a solar best practice guide for social housing providers, schools and community groups could be another possibility. Some of this help may already be available through organisations like the Energy Saving Trust, and we would not support any unnecessary duplication here. The GLA should investigate what demand there is for such support, and how it can help provide any support that is currently lacking.

Recommendation 8

The GLA's forthcoming London Energy Plan should set out options for supporting community energy schemes in London, including access to secure, long-term funding, and technical, legal and financial advice.

5. Minority opinion from the GLA Conservatives

5.1 The GLA Conservative group regrets that we are unable to support this report.

5.2 Whilst this investigation set out to look at positive ways to increase the generation of solar power in London, we feel that this intention has been lost by an over-emphasis on the Government's Feed-in Tariff consultation.

5.3 We are concerned that a constant focus on negative predictions risks talking down the UK's solar industry to the extent that these predictions become a self-fulfilling prophecy.

5.4 We would prefer to see a much more constructive discussion on practical measures to harness London's potential for solar energy, and for this reason we are unable to associate ourselves with this report.

Appendix 1 – Recommendations

Recommendation 1

The GLA's forthcoming London Energy Plan and any subsequent Energy or Environment Strategy should set out options for increasing domestic solar PV under different tenures, paying particular attention to landlords in the private rented sector including ways to engage with landlords and developers.

Recommendation 2

The GLA should only permit major developments where solar PV technology is included in the design or as a planning condition. This can be achieved through amendments to London Plan policy, reflecting planning changes that also make it easier to permit solar PV in conservation areas, and by applying this both to new build and retrofit proposals.

As borough policy has to be in conformity with the London Plan, this should also have an impact at local authority level and with homes and developments of all sizes. We encourage London boroughs to provide additional policy direction through SPDs following the approach of local authorities like Hackney and Camden.

Recommendation 3

More generally, the GLA should continue to use appropriate planning conditions in major planning applications to maximise the contribution that on-site renewables such as solar PV can make, in light of recent changes to Housing Standards. This would be particularly relevant in GLA-funded schemes where the GLA could set specific delivery goals for solar power as part of the deal.

Recommendation 4

The GLA should conduct research that would examine in greater detail the reason for the capital's poor performance, particular evident in the outer boroughs, in generating electricity from its residential rooftops. This could be done as part of or following the work on the London Energy Plan. The results will help the Mayor draw up more effective solar policies within his Environmental Strategy and the London Plan.

Recommendation 5

The Mayor should lobby the Government against its proposals to cut the FiT by 87 per cent, setting out the impact of these proposals on London in terms of solar PV deployment and solar jobs. He should argue for greater stability in solar PV policy, and gradual, predictable reductions in subsidies until at least grid parity is reached. He should also press the Government to restore the 'pre-accreditation' mechanism which helped community energy projects to manage longer lead times and to secure financing based on guaranteed rates.

Recommendation 6

The GLA's forthcoming London Energy Plan should clearly detail the expected renewable energy mix for London by 2025, and set out possible means to ensure solar PV meets its share. To do so, it should set out early priorities and a capacity target based on deployment potential. This will send a clear signal to the market that there is a major opportunity in London.

To support this, the technical and deployment potential for solar PV in light of technological development and falling prices must be comprehensively reviewed to ensure the actual potential for London is recognised.

Recommendation 7

Beyond the London Energy Plan, the Mayor's office should aim for higher ambition scenarios, setting out a timeline for developing a coherent, strategic direction with the view of making London one of the leading world cities for solar PV and for driving innovation. This is a separate work stream that also needs to be incorporated into the forthcoming London Energy Plan and any subsequent Energy or Environment Strategy.

More generally, the Mayor should engage more actively in developing policies for maximum capacity PV deployment, showcasing and promoting best practice and good examples of using solar PV in urban areas, for example by generating PV derived electricity from the TfL and wider GLA estate for London transport operational needs. This would increase awareness among housing providers and owners as well as other sectors and give them confidence to follow through with planning for or retrofitting solar panels.

Recommendation 8

The GLA's forthcoming London Energy Plan should set out options for supporting community energy schemes in London, including access to secure, long-term funding, and technical, legal and financial advice.

Appendix 2 – Endnotes

[1] For the purposes of this report, references to solar power relate just to photovoltaic (PV) power, and not to other types (such as solar thermal heating)

[2] Department of Energy & Climate Change (2013): UK Solar PV Strategy Part 1: Roadmap to a Brighter Future

[3] A survey commissioned by the BBC and carried out by ComRes in 2013 found that 84 per cent of the 1,035 polled supported more solar panels in their local area

[4] Department of Energy & Climate Change Public attitudes tracking survey: Wave 13, April 2015

[5] Feed-in Tariff Installation Report 1 April 2010 - 31 March 2015 – Ofgem and dwelling data from 2010 census (Nomis dataset DC4403EW)

[6] Feed-in Tariff Installation Report 1 April 2010 - 31 March 2015 – Ofgem

[7] GLA (2011): Decentralised energy capacity study Phase 1

[8] CO_2e, or carbon dioxide equivalent, is a standard unit for measuring carbon footprints. The idea is to express the impact of each different greenhouse gas in terms of the amount of CO_2 that would create the same amount of warming. That way, a carbon footprint consisting of lots of different greenhouse gases can be expressed as a single number

[9] The Guardian (2015): Green energy sector attacks chancellor's changes to climate change levy

[10] Office of National Statistics (2013): A Century of Home Ownership and Renting in England and Wales (full story). Part of 2011 Census Analysis, A Century of Home Ownership and Renting in England and Wales Release; In London, owner occupied household numbers will fall by 100,000 to 1.46 million, or just 42 per cent of the total, according to Savills forecasts

[11] Data from the Generalised Land Use Database (2005) estimates that 9 per cent of London's land use is for domestic buildings - which will only have increased since then. In comparison, 38 per cent are taken up by green space (excluding domestic gardens) and 12 per cent by roads.

[12] GLA (2015): Housing in London 2015. The evidence base for the Mayor's Housing Strategy

[13] Department of Energy & Climate Change (2013): An investigation of the effect of EPC ratings on house prices

[14] Energy Saving Trust, London Assembly Environment Committee meeting, 2 July 2015

[15] Written submission from the National Housing Federation

[16] Department of Energy & Climate Change (2014): Community Energy Strategy

[17] 'Community Power' a project in 12 European countries aiming to put people at the heart of increased renewable energy http://www.communitypower.eu/en/

[18] Greater London Authority, RE:NEW team, London Assembly Environment Committee meeting, 2 July 2015

[19] Written submission from the Greater London Authority

[20] businessGreen website – article, 20 July 2015: Over 200 businesses call on Chancellor to save zero carbon homes standard; The Guardian (2015): The nine green policies killed off by the Tory government

[21] London Borough of Hackney (2015): Sustainable Design and Construction Supplementary Planning Document (SPD) – Consultation draft

[22] This is subject to certain criteria being met, eg the panel(s) should project no more above the roof surface than a typical roof light and the property is not a listed building. The installation of solar panels on a domestic property may also require compliance with Building Regulations with regard to matters such as structural loading or electrical safety.

[23] In conservation areas panels must not be fitted to a wall which fronts a highway.

[24] Dwelling data comes from the 2010 census (Nomis dataset DC4403EW)

[25] Feed-in Tariff Installation Report 1 April 2010 - 31 March 2015 – Ofgem and dwelling data from 2010 census (Nomis dataset DC4403EW)

[26] In absolute terms, outer London has 3.5 times the installed solar PV capacity of inner London.

[27] Energy Saving Trust – website

[28] Calculated for a 4KW system that costs £5,300, benefits from current FiT rates, while assuming a certain rate of inflation as well as a rise in energy prices.

[29] Calculated for a 4KW system that costs £5,300, earning the currently proposed reduced FiT rates for 2016, while assuming a certain rate of inflation as well as a rise in energy prices.

[30] Department of Energy & Climate Change (2014): Climate change and energy – guidance. Policy impacts on prices and bills

[31] Solar Power portal website - article, 9 December 2011: UK homeowners do not realise how much the FiT incentive actually costs them

[32] Department of Energy & Climate Change (2014): Climate change and energy – guidance. Policy impacts on prices and bills

[33] Department of Energy & Climate Change (2015): Consultation on a review of the Feed-in Tariffs scheme

[34] BusinessGreen website – article, 27 August 2015: Feed-in Tariff cuts: the reaction

[35] ibid

[36] Department of Energy & Climate Change (2015): Periodic Review of FITs 2015 – Impact Assessment No: DECC0196

[37] Solar Trade Association - news release, 1 October 2015: Cut to solar energy feed-in tariff puts up to 27,000 jobs at risk across the UK

[38] The Guardian (2015): Solar-panel installer goes into administration, costing 1,000 jobs

[39] The Guardian (2015): CBI chief lambasts government approach to green economy

[40] Department of Energy & Climate Change (2014): Climate change and energy – guidance. Policy impacts on prices and bills; STA Solar Independence Plan, page 6

[41] KPMG/REA (2015): UK solar beyond subsidy: the transition, prepared by KPMG in the UK, at the request of the Renewable Energy Association (REA)

[42] London Assembly Environment Committee meeting, 2 July 2015

[43] The Guardian (2015): Al Gore puzzled by UK cuts to renewable energy support

[44] MQT 16 September 2015 – Transcript of Agenda Item 4

[45] London Fire Brigade, Annual Sustainable Development Report 2014/15, page 10

[46] According to information from the Better Buildings Partnership and responses to Mayoral Questions by Assembly Members on TfL Estate – Solar PV and MPS Estate - Solar PV

[47] GLA affordable housing statistics (up to August 2015)

[48] New York City solar map – homepage

[49] NYC Solar Partnership, City University of New York (CUNY)

[50] Google 'Project Sunroof' – homepage

[51] ibid

[52] Response to Mayoral Questions by Assembly Members on Solar PV - Local Authorities offering roof leases to community energy

[53] Written submissions from Circle Housing, Energise London, Solar Trade Association; Repowering London – Committee site visit to Brixton Energy

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Hindi

यदि आपको इस दस्तावेज का सारांश अपनी भाषा में चाहिए तो उपर दिये हुए नंबर पर फोन करें या उपर दिये गये डाक पते या ई मेल पते पर हम से संपर्क करें।

Vietnamese

Nếu ông (bà) muốn nội dung văn bản này được dịch sang tiếng Việt, xin vui lòng liên hệ với chúng tôi bằng điện thoại, thư hoặc thư điện tử theo địa chỉ ở trên.

Bengali

আপনি যদি এই দলিলের একটা সারাংশ নিজের ভাষায় পেতে চান, তাহলে দয়া করে ফো করবেন অথবা উল্লেখিত ডাক ঠিকানায় বা ই-মেইল ঠিকানায় আমাদের সাথে যোগাযোগ করবেন।

Greek

Εάν επιθυμείτε περίληψη αυτού του κειμένου στην γλώσσα σας, παρακαλώ καλέστε τον αριθμό ή επικοινωνήστε μαζί μας στην ανωτέρω ταχυδρομική ή την ηλεκτρονική διεύθυνση.

Urdu

اگر آپ کو اس دستاویز کا خلاصہ اپنی زبان میں
درکار ہو تو، براہ کرم نمبر پر فون کریں
یا مذکورہ بالا ڈاک کے پتے یا ای میل
پتے پر ہم سے رابطہ کریں۔

Turkish

Bu belgenin kendi dilinize çevrilmiş bir özetini okumak isterseniz, lütfen yukarıdaki telefon numarasını arayın, veya posta ya da e-posta adresi aracılığıyla bizimle temasa geçin.

Arabic

الحصول على ملخص لهذا المستند باللغة، فرجاء الاتصال برقم الهاتف أو الاتصال على العنوان البريدي العادي أو عنوان البريد الإلكتروني أعلاه.

Punjabi

ਜੇ ਤੁਸੀਂ ਇਸ ਦਸਤਾਵੇਜ਼ ਦਾ ਸੰਖੇਪ ਆਪਣੀ ਭਾਸ਼ਾ ਵਿਚ ਲੈਣਾ ਚਾਹੋ, ਤਾਂ ਕਿਰਪਾ ਕਰਕੇ ਇਸ ਨੰਬਰ 'ਤੇ ਫ਼ੋਨ ਕਰੋ ਜਾਂ ਉਪਰ ਦਿੱਤੇ ਡਾਕ ਜਾਂ ਈਮੇਲ ਪਤੇ 'ਤੇ ਸਾਨੂੰ ਸੰਪਰਕ ਕਰੋ।

Gujarati

જો તમારે આ દસ્તાવેજનો સાર તમારી ભાષામાં જોઈતો હોય તો ઉપર આપેલ નંબર પર ફોન કરો અથવા ઉપર આપેલ ટપાલ અથવા ઈ-મેઈલ સરનામા પર અમારો સંપર્ક કરો.

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