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ENVIRONMENT AND REGENERATION SCRUTINY COMMITTEE

11 January 2016

SECOND DESPATCH

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ISLINGTON

Corporate Resources
Town Hall, Upper Street, London N1 2UD

Report of: Solar Panel Task and Finish Group

Meeting of:	**Date**		**Ward(s)**
Environment and Regeneration Scrutiny Committee	11 January 2016		

		Non exempt

SUBJECT: Solar Panel Task and Finish Group – FINAL REPORT

1. Synopsis

1.1 Photovoltaic solar panels have become a sensible investment option following a reduction in the cost of installation. However the investment return for social housing needs to be balanced against the benefit to resident, which if maximised may result in a higher installation cost and a less attractive investment.

1.2 It is technically possible to provide individual residents in housing blocks with energy generated by solar panels. Residents in street properties may be less suitable at the moment for solar panels due to conservation area restrictions and contractual responsibility in regards to PFI properties.

1.3 Community models have been developed that allow residents to invest directly into the project with guaranteed rates of return; these are still in their infancy.

1.4 HRA investment is not available for PV projects as investment has been taken up by other measures such as external solid wall insulation that will provide a greater financial benefit to each resident. But there is scope for other sources of financing such the Public Works Development Board.

2. Recommendations

2.1 That the council considers reviewing the cyclical works programme within our housing estate to see if photovoltaic solar panels can be added to future roof replacements where it can be guaranteed that residents affected will benefit from £100 of free electricity per annum and the council can maintain a return on the investment of at least 8%.
That the Council also consider installing solar panels on blocks where there is access to roofs without resorting to expensive scaffolding, provided the other criteria is met.

2.2 That a review is undertaken by corporate finance to consider the most appropriate funding mechanism for any potential future investment both in the UK and Europe.

2.3 That the Council works with Tenant Management Organisations encouraging and supporting them to utilise their financial reserves for the installation of solar panels, including where appropriate the use of community energy models.

2.4 That the Council notes Photovoltaic cells are being installed on Corporate Buildings and attracting the present economic tariff.

3. Background

3.1 The Solar Panel Task and Finish Group were introduced to explore the potential of rooftop solar energy on the council estate. It explored how solar panels on the roofs of Council housing could contribute to the alleviation of fuel poverty amongst Council tenants, provide an income stream for the Council and create jobs in the Borough.

3.2 As council properties are managed by different departments the group was supported by representatives of the Housing, Corporate Property and Public Realm Energy teams.

3.3 The group members are Cllr Mick O'Sullivan (Chair), Cllr Claudia Webbe, Cllr James Murray, Cllr James Court and latterly Cllr Richard Greening.

3.4 The UK solar energy sector has seen remarkable growth in recent years. Over 8 GW of solar panel capacity has been installed to date. The cost of installation has dropped massively in recent years due mainly to a collapse in the price of solar panel modules and its related equipment. The installed capacity is expected to rise to over 12 GW by the end of 2016. Very little of this has been installed in the public sector to date. The Solar Panel Task & Finish Group commissioned work identifying 20 megawatts of potential solar generating capacity on the Council roof estate from flat and pitched roofs that face between South East and South West. Enough to provide every tenant household with 800 kilowatt hours of power every year.

3.5 Cost Breakdown:

Fig. 1 Summary of PV costs at July 2015

Description	Percentage	£/kW	per unit £
Surveys, design and approvals	2.3%	£30.00	£29.64
Access and Installation	30.4%	£400.00	£296.44
Grid Connection and Commissioning	1.5%	£20.00	£15
Panels, Inverters and fixing system	55.5%	£730.00	£541
Data, cable management and metering	4.6%	£60.00	£44
Material Delivery	0.8%	£10.00	£7
Warranties, guarantees & O&M documentation	6.8%	£90.00	£67
Fees	9.2%	£121.50	£90
TOTAL	**100.0%**	**£1,461.50**	**£1,090**

When a rooftop solar panel is installed the following devices are installed:

- Solar Panels: These convert sunlight to direct current electricity; cost: £530 per kWp
- Inverter: This converts sunlight to alternating current (either 400V or 240V); Cost:£110 per kWp
- Fixing systems: Frames that fix the solar panels to different roof types; Cost £90 kWp.
- GSM generation meter. This measures the electricity generated £20 kWp.
- System Installation: The labour cost of installation; cost: £350 kWp
- Other costs relate to certification and fees from planning, building control, Distribution network operators; data management etc.

These costs assume implementing PV during roof replacement works, If works are standalone; we could expect costs for access and prelims to increase the overall costs by approximately 31%, giving a cost of £1,722 per kWp installed, if scaffolding costs are added.

3.6 Most modern solar panels come with a warranty that guarantees the panel will operate at over 90% capacity after ten years and at over 80% over 25 years. These warranties are reckoned to be conservative estimates.

3.7 The council currently pays approximately 9p per kWh for the electricity supply to its offices and depots. So installing panels on commercial and office roof areas first is a no brainer.

3.8 We welcome the decision by the executive to invest over £1m into installing solar panels. Panels are being installed on the following corporate buildings in advance of the change in tariff.

Site	Roof Type/s	System Rating	Annual Generation	Carbon Savings
		kWp	kWhr/yr	tCO2/yr
Waste Recycing Centre	pitched	230	178,070	82
Tennis Centre	pitched	175	128,508	59
Sobell Leisure Centre	flat	250	210,887	97
222 Upper Street	flat	25.65	24,330	11
Total		**680.65**	541,795	**248**

3.9 We did not look at Partners managed street properties due to the poor state of the roof maintenance and high risk of disputes in the event of roof leaks.

3.10 **Areas of investigation**

- We concentrated on council estate properties
- We looked at what other boroughs are doing such as Peterborough, Bristol and Portsmouth.
- We looked at community Energy Models such as Repowering Hackney
- We looked at OVO community energy model, which includes a power purchase agreement option for tenants to buy the electricity we generate.

3.11 **Issues**

The regulations around selling electricity are complicated and are still in a state of flux. Becoming an electricity supplier can be very costly.

3.12 Currently High rise housing blocks have much less capacity to supply solar electricity to individual properties due to the lack of roof space per household. But it should be perfectly possible to supply Households with substantial power in blocks that are up to six stories high. In future it may be possible to mount panels on south facing walls of high rise blocks which some developments already do.

3.13 We looked at roof space for solar panels but it's important to note that there is significant potential in solar panel car park canopies in council controlled parking areas, estate access roads and paths. But exploring this capacity is a few years down the road. Any short term development of these areas should be designed to take advantage of future solar needs.

3.14 Installing solar panels on top of blocks and allowing tenants living in these blocks to consume the electricity generated for free or at a reduced rate is the best way, but will not be achievable in all cases.

3.15 Using Smart electricity meters to reduce costs. There is currently an obligation on energy suppliers to install smart meters in all properties by 2020 which is only five years away. Smart meters differ from the traditional meters in that they are a lot more flexible in the data they measure and are programmable. They can show people how much electricity they can consume over a given period and could be used to meter the renewable electricity supplied to a property. The idea behind them is that people will be able to manage their electricity more efficiently. The implication is this could eliminate the card meters for many of our fuel poor residents. We could also charge a reduced rate for electricity consumed below a certain amount reverting to higher rate if this amount is exceeded. The rate could also be tailored to an individual, with say pensioners getting a better rate than working age people. Using smart meters would allow us to install only one inverter per project resulting in significant savings

3.16 Orsis ltd. A smart meter provider, supplies systems where solar panels provide electricity to a number of different smart meters in a commercial setting, Data can de collated from an average of 5 meters for each data transfer point. This saves on the initial data management investment and the ongoing cost of communicating the panel performance. There is no great obstacle to adopting such a system to residential use.

3.17 It is common when solar panels are installed on flat roofs these days to use fixing and mounting systems that are non-penetrating, but lay on a protective mat with ballast to secure the panels. The protective mat to protect the roof from damage. According to manufacturer Redtip ltd. These are also faster to install.

3.18 The key of keeping down the cost of installation is to integrate the installation of solar panels with the Council's cyclical maintenance programme where scaffolding is necessary to access roofs. But not all roofs are accessible by scaffolding alone. So an independent programme for these types of property should be looked at.

3.19 Solar panels generate income in three mainstreams:
Generation tariff: The biggest part of FIT tariffs, rates are dependent on the size of the solar array, but also the number of systems owned by the organisation or individual and the energy efficiency rating of the building attached to the panels. The rate of the tariff is reviewed quarterly and can be revised down each quarter depending on the number of installations. There is an automatic reduction of 3.5% every 9 months if degression thresholds are not met each quarter. The generation tariff is linked to RPI. The mid and high generation tariff reduced by 7% to 57% which is an uneconomic level at present.

3.20 **Export Tariff:** A smaller export tariff is given for the amount of electricity generated but not used on site and exported to the grid. For systems smaller than 30kWp this is "deemed" to be 50% of the generation, for larger systems an export meter is required to measure the amount of power exported. This is also connected to inflation and will rise incrementally each year according to inflation.

3.21 **Electricity directly consumed:** This is the electricity a site gets for free from the solar panels. Depending on the sites electricity tariff this will save 10p – 15p kWh but can be as high as 20p kWh for some on social tariffs.

Fig 2.Feed in Tariff Structure (generation and export tariffs) from January 2016

Generation tariff			Export tariff (p/kWh)	System Size kW
Low (p/Kwh)	Mid (p/kWh)	High (p/kWh)		
5.73	10.83	12.03	4.85	0-4 kW
10.90	9.81	5.73	4.85	4-10 kW
10.90	9.81	5.73	4.85	10-50 kW
9.29	8.36	5.73	4.85	50-100 kW
9.29	8.36	5.73	4.85	100-150 kW
8.89	8.00	5.73	4.85	150-250 kW
5.73	5.73	5.73	4.85	250 kW+

Fig.3 Anticipated Feed in Tariff Structure (generation and export tariffs) pending changes to the statutory instrument.

FIT tariff (p/kWh)	System Size kW
1.63	0-10 kW
3.69	10-50 kW
2.64	50-250 kW
2.28	250-1000 kW
1.03	1MW+
1.03	Standalone
4.85	Export

3.22 Nationally, the Public Estate is committed to delivering 500 MW of solar capacity of which 250 MW will be roof top mounted. But the tariff has now been reduced by the Government and the installation is at present uneconomic (see fig.3).

3.23 **Risks**

Risks can generally be categorised into three areas, FIT tariff / financial risks, risks from dependent projects and building / site related risks. The risks stated below highlight the main areas of risk, but are not exhaustive.

3.24 **FIT / FINANCIAL RISKS**

- Feed in tariff (fit) rates are reviewed every 3 months and can be reduced by up to 28% depending on the rate of deployment, deployment thresholds differ depending on the system size, however degression levels are 3.5%, 7%, 14% and 28%. There is a minimum degression of 3.5% every 9 months if deployment. Historically there have been very few degression thresholds met and to date these have been confined to the minimum 3.5%.

- There is a risk that delays in installing the panels will result in a reduction to the income from FIT rates. As FIT rates are themselves variable, there is a risk that once any project receives funding the business case may no longer be viable. Future projects will need to review the financial position.

3.25 **DEPENDENT RISKS**

- The financial business case for a PV project within housing has been worked out on the basis that it will form part of a roof renewal project. Tagging PV onto these projects is likely to reduce

the delivery cost by around 30% (access and prelims). If PV was a standalone project the financial business case would need to stand up to this additional pressure.

- PV opportunity could be severely constrained by the roof renewal programme. There is no guarantee that the roofs selected for renewal will present any potential for PV generation. The most suitable roofs for PV may not be provided as opportunities.

3.26 **SITE / BUILDING RISKS**

- Roof structure too weak – The building's roof structure may require substantial (and expensive) strengthening to support panels. This could increase the time to delivery and substantially increase cost.

- Local infrastructure issues – There are local energy infrastructure issues that could be identified during the G83 / G59 application process. UKPN could require the council to put significant investment into the local grid to enable it to handle the power generated from the PV array.

- Planning conservation issues – Although permitted development rights have been improved in recent years, there is still a potential requirement for planning approval for any listed buildings or buildings situated with a conservation area.

- Shading – There remains the risk that suitable buildings that are appropriate for PV within the re-roofing programme could be later affected by shading from future development. There is no protection in planning law in regards to ensuring any development doesn't impact on the performance of PV panels.

- Internal electrical distribution system. – Limitations on the existing electrical distribution system within the building could affect the generation capacity that is viable from a building.

3.27 **Fuel Poverty**
Solar photovoltaic installations within residential housing blocks have the potential to benefit individual residents by up to £100 per annum. This would only be possible where individual connections are made and would require residents to ensure regular access. Installing individual systems would be more expensive than one communal system, reducing the number of residents overall that would benefit. Having said that, the individual benefit would increase dramatically as communal electricity savings are shared across all our tenants thus reducing the individual benefit to around £4 per annum. Installing individual systems could also allow us to specifically target residents that would benefit the most from these systems.

4. Implications

4.1 **Financial implications:**

Currently the average return for most Solar PV projects is 10%

The total cost of installing solar panels on all the council roofs is currently estimated at £25m.

Housing are taking the approach of 'fabric first' (i.e. correctly applied insulation to a property cuts the residents bill substantially) and cannot commit funding from the HRA to support the installation of PV. Funds are limited and it makes sense to use what resources are available to complete the remaining insulation projects (mainly external cladding for tower blocks)

Islington Council can borrow significant amounts of money from the Public Works and Loans Board at low interest rates.

Pension Funds are looking at investing in infrastructure projects as a substitute for investment bonds.

Solar panels are seen as attractive given that as FIT payments increase with inflation they can be used to match with long term liabilities.

The scope for genuine sustainable local employment in installing the panels is limited.

4.2 **Legal Implications:**
To be confirmed

4.3 **Environmental Implications:**
Solar panels generate renewable electricity and therefore offset the production of electricity from fossil fuels, benefiting the environment to a very great extent. Solar panels also have a long design life and very low failure rates ensuring that the materials used in the installation will involve as little additional resource as possible.

4.4 **Resident Impact Assessment:**
An initial assessment will be undertaken to consider if a full Resident Impact Assessment is required. It is also worth noting that some economic benefit is expected to be available to residents affected.

5. Conclusion and reasons for recommendations

5.1 Officers from Environment and Regeneration and Housing should cooperate in finding and assessing suitable projects on the Council's Residential property.

5.2 Solar panels have a part to play in reducing fuel poverty amongst tenants. Some properties are currently unsuitable for solar panel schemes. However, this should not be used as an excuse not to deploy the systems on suitable properties. Panel installations for residents should be used in conjunction with smart cards.

5.3 Costs can be minimised by viewing solar panel installation as a pipeline of projects rather than a series of one offs.

5.4 All projects should be assessed for viability i.e. we should expect a return of 10% as a minimum.

5.5 The key in getting any solar installation right is in the timing. As the technology matures prices for component drop installed capacity will rise and feed in tariffs will reduces accordingly. As a rule of thumb prices decline in real terms by 20% for every doubling of installed capacity and installed capacity doubles every three years. FIT's won't last forever. So we should look at installing solar panel schemes in the next 3 to 4 years.

5.6 Proceed with rolling out solar panels on Council owned Commercial and office roofs in this financial year. Documenting the experience and retaining any lessons for future development.

5.7 Investigating partnerships with organisations like Ovo and Bunhill heat and power. Longer term we should look to becoming an electricity supplier in our own right.

5.8 When a solar panel is installed make sure that as much of the roof as possible is covered with panels.

5.9 TMO's manage a quarter of our estate properties, they have substantial surpluses.

TMO's should be encouraged to explore the installing community energy schemes and we should facilitate and encourage them to use their reserves do so.

5.10 Financing should come from outside the HRA. Any surpluses should accrue to the general account rather than the HRA.

Appendices

Background papers: (available online or on request)

Final report clearance:

Signed by:

	Director for Joint Board/Committees or Exec Member if going to the Executive	Date

Received by:

	Head of Democratic Services	Date

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