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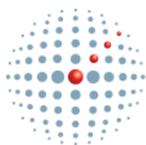
Solar Renewable Potential in North London - work stream 3: Evaluation



CT Account Manager: Giles Hobson
Email: giles.hobson@carbontrust.co.uk
Tel: 0870 190 6254

Presented to: Haringey Council, Carbon Trust
Author: Bethan Phillips
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Author: Bethan Phillips

Signature (hard copy only)

Date: (hard copy only)

QA: Duncan Price

Signature (hard copy only)

Date: (hard copy only)

Author contact details

Email: bethan.phillips@camcoglobal.com
Telephone:

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1 Executive summary

Camco have been appointed by the Carbon Trust, on behalf of the London Borough of Haringey, to undertake a study of the potential for developing the potential for solar renewable energy technologies in north London.

The key objective of this project is to unlock investment in roof-mounted solar photovoltaic (PV) and solar thermal technologies, and maximise the resulting benefit for the local area by developing inter-borough delivery partnerships for PV on council-owned non-domestic and domestic buildings, including social housing stock. This will be done by establishing the opportunity potential across the north London area, and on the basis of this potential, establishing a large-scale delivery model, where economies of scale reduce procurement costs, which may be attractive to groups of investors or partners.

The project is delivered in three “Work Streams”. This report presents the findings of Work Stream 3, the final Work Stream. For details of Work Streams 1 and 2, refer to the associated reports.

The three “Work Streams” are as follows:

1. Opportunity mapping
2. Market testing – analysis of finance and delivery options
3. Evaluation

Work Stream 3 is focussed on evaluating the opportunity mapping and market testing processes undertaken as part of Work Streams 1 and 2, and highlighting key learning points for the sector. This includes a review of the data collection methodology and evaluation tool process used to derive the project outputs, and an overview of any key assumptions and limitations that may have restricted the value of the work.

Some limitations with the assessment of opportunity potential have been identified relating to:

- Uncertainty on future Feed in Tariff policy
- Data validity
- The high level nature of the assessment, based on the need to assess all of the buildings within the portfolio using the data available and without a physical survey

However, the purpose of this project has been to enable the participating LA’s to estimate the opportunity potential for solar renewables, to enable them to progress to evaluating the business case and selecting an appropriate procurement route. Given the number of buildings contained in this portfolio of buildings (around 35,600), the methodology for estimating the opportunity potential is considered appropriate, even within the constraints of the assumptions and limitations identified in this report.

2 Introduction

2.1 Background

Camco have been appointed by the Carbon Trust, on behalf of the London Borough of Haringey, to undertake a study of the potential for developing the potential for solar renewable energy technologies in north London.

The key objective of this project is to unlock investment in roof-mounted solar photovoltaic (PV) and solar thermal technologies, and maximise the resulting benefit for the local area by developing inter-borough delivery partnerships for PV on council owned non-domestic and domestic buildings, including social housing stock. This will be done by establishing the opportunity potential across the north London area, and on the basis of this potential, establishing a large-scale delivery model, where economies of scale reduce procurement costs, which may be attractive to groups of investors or partners.

In order to maximise the scale of the opportunity, as well as to take advantage of the potential to share learning across boroughs, a cross-borough working group has been established in the north London region, in which the solar renewable energy potential will be considered within this area. The following boroughs are involved:

- London Borough of Haringey, LSP (Local Strategic Partnership) and Haringey 40:20
- London Borough of Camden, LSP and Climate Change Partnership
- London Borough of Islington, LSP and Climate Change Partnership
- London Borough of Waltham Forest, and LSP
- London Borough of Enfield and LSP
- London Borough of Hackney and LSP

The project is led by the London Borough of Haringey, on behalf of the cross-borough working group.

Haringey 40:20 is a membership organisation which is working towards achieving a carbon emissions reduction of 40% by 2020 (compared to 2005 levels), as part of the Friends of the Earth 'Get Serious' campaign. This target was adopted by the Council in November 2009, together with a commitment to develop an action plan to reduce carbon emissions. Haringey 40:20 provides a forum to take forward the development of the borough wide carbon management plan being developed in 2011 and also provides information and support to members.

Key drivers for the local authorities involved in this project are:

- **Income generation**

This is the primary client driver for this project, and taking advantage of opportunities offered by building stock, both domestic and commercial.

- **Carbon reductions**

A further driver is the generation of tangible carbon reductions which have the ability to be realised relatively quickly. Income can be used to offset investment in energy efficiency improvements. Each of the boroughs involved has already identified the installed capacity of renewable energy required to achieve long term carbon reduction targets.

- **Energy cost savings**

Through the introduction of solar renewable technologies, it is expected that energy bill reductions can be achieved for both local authorities and residents in domestic properties. In

particular, the recent introduction of government incentive schemes for both technologies to support their uptake in the UK - the Feed In Tariff for PV and the Renewable Heat Incentive for solar thermal - provide further financial support for these technologies. These are discussed in more detail later in this report.

Additional, secondary drivers include:

- Improved engagement by building users with renewable energy technologies and energy consumption
- General energy awareness throughout the region through visibility of technologies

2.2 Project scope and objectives

The project is delivered in three “Work Streams”. This report presents the findings of Work Stream 3, the final objective. The three “Work Streams” are as follows:

1. Opportunity mapping
2. Market testing – analysis of finance and delivery options
3. Evaluation

Work Stream 3 is focussed on evaluating the opportunity mapping and market testing processes undertaken as part of Work Streams 1 and 2, and highlighting key learning points for the sector. This includes a review of the data collection methodology and evaluation tool process used to derive the project outputs, and an overview of any key assumptions and limitations that may have restricted the value of the work.

2.3 Methodology

The project has been split into three work streams. The table below indicates the objectives under each work stream and the associated delivery process. This report covers work undertaken within Work Stream 3.

Table 2-1 Methodology summary

Methodology		
Work Stream	Objectives	Delivery process
1	Opportunity mapping Develop pre-feasibility assessment method and collection tool and deliver training Carry out pre-feasibility and collect data in consistent format across the sub-region	Establish and agree and criteria
		Design evaluation tool
		Data collection
		Analysis of opportunity potential
		Design and deliver a training package
2	Market testing – analysis of finance and delivery options Carry out assessment of ownership and delivery models and relative benefits of each Carry out analysis of potential local economic benefit	Market analysis
		Finance and delivery options analysis
		Outline finance model
		Investment prospectus
3	Evaluation Carry out evaluation of work undertaken, and produce guidance for Local Authorities	Evaluation of solar opportunity process
		Presentation to steering group

3 Evaluation of solar opportunity process

3.1 Policy

A major factor which may set limitations on the value of this project is a lack of clear policy direction for FIT. As described in the Work Stream 1 report, the revised generation tariffs which were published under the government's fast track review of PV for installations >50kWp will take effect from the 1st August 2011. The government's comprehensive review will address installations <50kWp. The government has said these rates will remain unchanged until April 2012, 'unless the review reveals a need for greater urgency', and therefore there is some degree of uncertainty on these figures.

In addition, Greg Barker has said, "The Government fully supports "rent roof" models (third party ownership financial packages), especially in the context of opening up the benefits of FITs to those living in social housing. However, the effectiveness and costs of all elements of the FITs scheme will be considered as part of the comprehensive review which will be tasked with improving the scheme to deliver both greater long term certainty to industry and investors and also deliver value for money to consumers." On this basis, there is also therefore uncertainty relating to portfolios of projects, although the suggestion is that social housing portfolios will be unaffected.

3.2 Data validity and GIS analysis

The reliability of the viability assessment of the buildings portfolio carried out under Work Stream 2 is dependent on a number of factors:

1. A key factor is the validity of the data obtained from each local authority (LA). For example, some buildings were initially included in the LA asset lists but were subsequently found to be unsuitable because the LA only owned the freehold and the leaseholders were not a public sector organisation. For some of the sites, the building type was not available in the dataset received, or the building type stated did not appear to correspond to cross-checks with Google Maps.
2. In general, the limited input information on individual sites limited the quality of the output. For example, information on the type of roof construction was not available. However, the tool is intended to allow LA's to refine the outputs by adding additional information in the data fields provided.
3. There were no Unique Property Reference Numbers (UPRNs)¹ available for any of the residential properties across all boroughs except Camden, and no UPRNs for any of the non-residential properties in Haringey. As a result, a manual process had to be carried out of looking up the address provided in the LA dataset against Ordnance Survey data, in order to obtain each property's coordinates. Accurate locations were successfully obtained in this way for around 80-85% of all the properties for which data was provided by each of the LAs. For the remaining sites, the property's postcode was used to obtain the location. As postcodes are not necessarily specific to a single property, this may have resulted in an approximate location, rather than an accurate one – this means that it is possible that either the wrong building or no building could have been identified. However, this is considered unlikely to be an issue for the buildings analysed here as these are the largest buildings and, as a result, the postcode is likely to be unique to the property.
4. As part of the building specific GIS analysis that was carried out to assess the solar potential for the largest buildings, a broad estimate of over shading was made, to give a

¹ A Unique Property Reference Number (UPRN) is a unique identifier for each land and property unit

banded assessment, from no apparent shading, to likely tree shadow to likely building shadow. As this stage, this level of detail is considered appropriate. However, during the detailed design stage, a more detailed assessment would clearly need to be made.

3.3 Portfolio evaluation process

The primary limitation with the assessment of overall portfolio potential is that it is high level, although it is supported by more detailed analysis for the 1,000 sites analysed in the evaluation process. The proportion analysed represents around 25% of non-residential buildings, but this is only 3% of the total number of properties owned by the LAs, and therefore a number of broad assumptions were made to assess the additional potential available from the remaining buildings. These are set out in the Work Stream 2 report.

The actual portfolio potential will not be known until each building is selected for PV installation and subsequently surveyed to determine the actual PV capacity that can be installed.

3.4 Evaluation tool

The evaluation tool has been designed to assist in prioritising sites and to take into account as much information about the site as possible, without requiring a physical survey. This should be taken into consideration when using the tool. However, as described above, ultimately a detailed review of individual sites will be required before the actual installed PV capacity is determined.

The tool has evolved to include a number of relatively advanced features, such as consideration of the optimum arrangement of panels within a given area of roof, and discounted cashflow analysis for every site. This is intended to ensure LA's are able to assess each site in as much detail as possible. This has also resulted in a complex Excel spreadsheet, the structure of which cannot easily be modified by LA's themselves if required. However, the tool has been structured so that parameters and assumptions are clearly identified on separate tabs, with colour coding to help to show users which figures can be changed and which should not. Some of these figures should also be revisited from time to time to ensure that figures are kept up-to-date, particularly capital costs.

4 Potential carbon savings

This section analyses the KPIs which are required for Carbon Trust reporting.

Work Stream 2 identified the estimated potential for overall theoretical potential for roof-mounted PV across the region at 72MWp for projects with an IRR of greater than 6%, and 35MWp for projects with an IRR of greater than 10%. As described in the Work Stream 2 report, a practical and realistic assumption may be that 10% of the theoretical potential is realised, giving a programme of up to 8MWp.

Taking 8MWp of the highest ranked sites by overall scoring from the evaluation tool – i.e. the sites which have the highest IRR, are located on a single area of roof, etc (refer to the Work Stream 1 report) - gives an estimated total output of 6,541MWh. This translates to a carbon saving potential of 3,566 tonnes CO₂, based on an emissions factor for electricity of 0.545kgCO₂/kWh. The associated capital cost, using information from the evaluation tool, is £23,958k. The annual savings associated with avoided electricity costs are estimated to be around £654k, based on an avoided electricity cost of 10p/kWh.

5 Conclusions

The purpose of this project has been to enable the participating LA's to estimate the opportunity potential for solar renewables, to enable them to progress to evaluating the business case and selecting an appropriate procurement route. Given the number of buildings contained in this portfolio of buildings (around 35,600), the methodology for estimating the opportunity potential is considered appropriate, even within the constraints of the assumptions and limitations identified in this report.



camco

www.camcoglobal.com

Camco Advisory Services Ltd

172 Tottenham Court Road, London, W1T 7NS

t +44 (0)20 7121 6100 f +44 (0)20 7121 6101

Registered office address: Overmoor, Neston, Corsham, Wiltshire, SN13 9TZ Company registration number 01974812