

## **PLANNING AND DESIGN AND ACCESS STATEMENT**

### **RETROSPECTIVE PLANNING APPLICATION FOR A SOLAR PHOTOVOLTAIC INSTALLATION**

**MENGHAM JUNIOR SCHOOL, PALMERSTON ROAD, HAYLING  
ISLAND, PO11 9ET**

PROJECT REFERENCE: Mengham Junior School

DATE: January 2013

20 Old Bailey  
4<sup>th</sup> Floor  
London  
EC4M 7AN

Lightsource Renewable Energy Limited  
Company Number 7129343



## CONTENTS

|       |                                   |   |
|-------|-----------------------------------|---|
| 1     | Introduction .....                | 1 |
| 1.1   | General .....                     | 1 |
| 1.2   | Photovoltaic Panels .....         | 1 |
| 1.3   | Eco Schools Solar Programme ..... | 1 |
| 1.4   | Policy Context .....              | 2 |
| 1.4.1 | Renewable Energy Targets .....    | 2 |
| 1.4.2 | National Policy .....             | 2 |
| 2     | Site Appraisal .....              | 4 |
| 2.1   | Site Description .....            | 4 |
| 2.2   | Local Context .....               | 4 |
| 3     | Existing Development .....        | 5 |
| 3.1   | Existing Use .....                | 5 |
| 3.1   | Scale and Amount .....            | 5 |
| 3.1.1 | Operation .....                   | 5 |
| 3.2   | Layout .....                      | 6 |
| 3.3   | Appearance .....                  | 6 |
| 4     | Conclusions .....                 | 9 |

## 1 INTRODUCTION

### 1.1 GENERAL

This planning and design and access statement has been prepared in support of a planning application for full permission for the development of a roof mounted photovoltaic (PV) solar energy generation system.

Mengham Junior School is located at Palmerston Road, Hayling Island, PO11 9ET as identified in the Site and Location Plan. The roof area is 450 square meters in size, with solar modules covering approximately 65 square metres. The as-built layout for the PV modules is shown in the Layout Plan and Block Plan.

The purpose of the development is to convert daylight into electricity to generate renewable energy for use by Mengham Junior School. This micro scale solar development has a generation capacity of 9.4 kilowatts (kW), which is similar to the energy requirements of approximately 3 houses, and will result in a saving of approximately 4,500kg in CO<sup>2</sup> emissions per annum.

### 1.2 PHOTOVOLTAIC PANELS

Photovoltaic panels are designed to absorb daylight and convert it into electricity. In comparison to other energy generation methods, there are very limited environmental effects associated with the construction and operation of small scale PV energy generation systems. The minimal maintenance and the long service lifetimes (25-30 years) mean that any effects on the local community will be limited to the short construction period.

### 1.3 ECO SCHOOLS SOLAR PROGRAMME

Eco Schools is an international programme guiding schools toward more sustainable operations and enhanced environmental education for pupils. The Eco Schools Solar Programme in the UK was established to utilise the renewable energy Feed in Tariff in order to provide free electricity for participating schools as a well as creating an opportunity for additional learning, through the use of displays showing how much clean energy the school is generating and the carbon dioxide savings.



Winch Energy has partnered with Eco Schools to develop and build PV systems on the roofs of a number of schools participating in the Eco Schools Solar Programme. Lightsource Renewable Energy Ltd is a solar energy company working with Winch to deliver these systems. Lightsource will manage, monitor and maintain each of the PV systems that are installed.

## 1.4 POLICY CONTEXT

The UK Government has implemented policies and strategies to provide support for low carbon technologies and in particular to incentivise the development of renewable energy technologies. With UK reserves declining, renewable energy generation is increasingly important for security of electricity supply as well as reducing greenhouse gas emissions.

### 1.4.1 RENEWABLE ENERGY TARGETS

In 2005 the Kyoto Protocol came into effect, under this the United Kingdom is committed to reducing greenhouse gas emissions by 5.2% from 1990 levels by the year 2012. The UK has also signed up to the EU Renewables Directive, which states that 15% of total UK energy consumption should be generated from renewables by 2020, with this target rising to 80% by 2050.

The UK's Renewable Energy Strategy (RES) sets out how the UK will increase its renewable energy generation and reduce greenhouse gas emissions. The RES is based on a scenario of 30% of electricity, 12% of heat and 10% of transport being generated from renewables by 2020. Currently the UK is producing around 7% of its electricity from renewable technologies.

### 1.4.2 NATIONAL POLICY

Renewable energy generation is a key element of the Government's approach to reducing emissions of CO<sup>2</sup>. In 2008, the UK Government passed the Energy Act 2008, driven by the twin aims of tackling climate change by reducing CO<sup>2</sup>, and the need to ensure secure, clean and affordable energy into the future. The Act implements the legislative aspects of the 2007 Energy White Paper, including establishing enabling powers for the introduction of Feed-in Tariffs (FITs) to supplement the Renewables Obligation and incentivise small-scale low-carbon electricity generation such as solar.

The National Planning Policy Framework (NPPF) was published on 27<sup>th</sup> March 2012, replacing all national level Planning Policy Statements, Planning Policy Guidance, and regional planning guidance. The central theme of the NPPF is the presumption in favour of sustainable development, as detailed in Paragraph 14.

Part 10 is of most relevance to renewable energy generation. Paragraph 97 states that in order to increase the use of renewable and low carbon energy generation, local planning authorities should "recognise the responsibility on all communities to contribute to energy generation from renewable or low carbon sources". It goes on to state that LPAs should have "a positive strategy to promote energy from renewable and low carbon sources; [and] design their policies to maximise renewable and low carbon energy development while ensuring that adverse impacts are addressed satisfactorily."

Paragraph 98 advises that when local authorities are determining planning applications, they should "not require applicants for energy development to demonstrate the overall need for renewable or low carbon energy and also recognise that even small-scale projects

provide a valuable contribution to cutting greenhouse gas emissions; and approve the application if the impacts are (or can be made) acceptable.”

## **2 SITE APPRAISAL**

### **2.1 SITE DESCRIPTION**

The small scale roof based solar energy generation system is comprised of the following:

- 39 PV modules, with a combined output capacity of 9.4kWp. A module specification is included with this application.
- The panels are mounted on the roof on A-frames at an angle of 25 degrees to the roof profile, as shown in the Layout Plan and image 2 and 3 below.

The PV panels are wholly contained within the existing roof area, as shown in the Layout.

### **2.2 LOCAL CONTEXT**

The school building is located at Palmerston Road, Hayling Island. The local area has the following characteristics:

- The school is in the village of Mengham on Hayling Island and is located within a residential area.
- The site does not lie within an area of outstanding natural beauty or any other designations. The site is approximately 200m west of the Chichester Harbour Area of Outstanding Natural Beauty, however due to existing vegetation and the orientation of the panels facing south there will be not impact upon this area.
- There are no listed buildings within the curtilage of the school building
- There are three listed buildings within 500m of the site and a scheduled ancient monument approximately 700m northeast of the site; however none of these or any other heritage assets will be impacted upon by the installation of solar panels on the school building.

### 3 EXISTING DEVELOPMENT

#### 3.1 EXISTING USE

The use of the building will still continue under the current use. The panels are installed upon the roof and will generate energy to be used by the school.

#### 3.1 SCALE AND AMOUNT

The small scale roof based solar energy generation system is comprised of the following:

- 39 PV modules, with a combined output capacity of 9.4kWp. The panels are 1.64m x 0.992m, with a depth of approximately 0.04m. A panel specification is included with the application.
- The panels will be mounted on the roof on A-frames at an angle of 25 degrees with the roof profile, as shown in the Layout Plan.

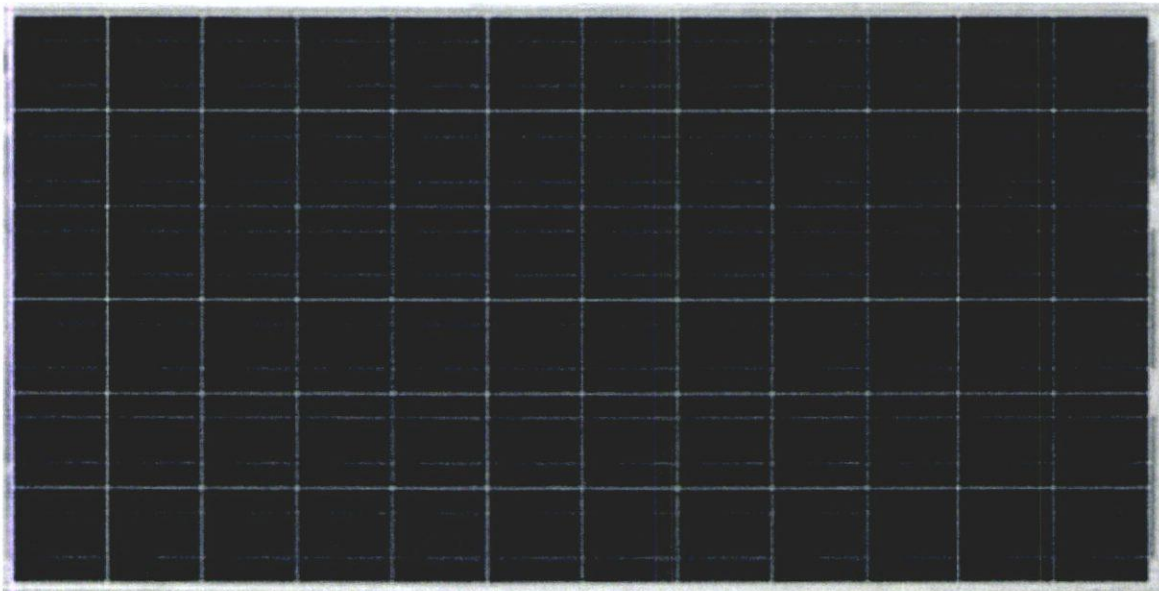


Image 1: Example of the type of PV solar panel which will be installed

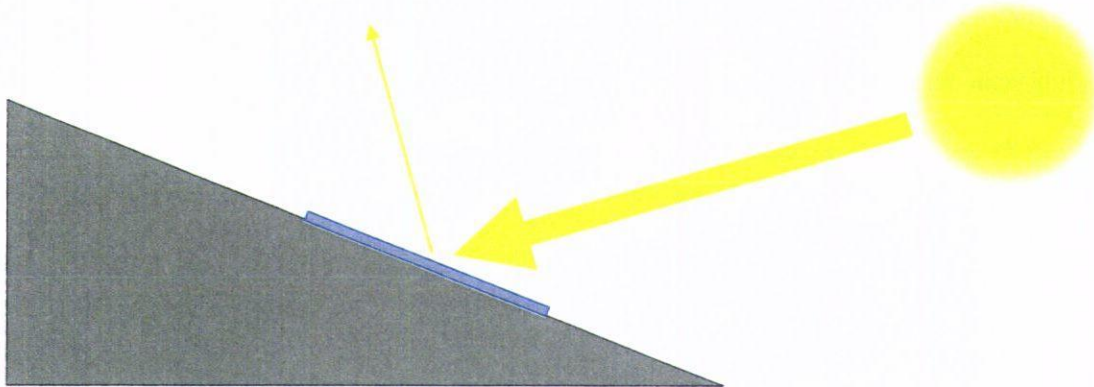
##### 3.1.1 OPERATION

Solar PV systems require little maintenance, with post-construction activity limited to occasional visits to clean, check and repair the panels, by personnel using small vehicles (4x4 or transit van type).

The PV panels do not generate a perceptible noise that would impact on the amenity values of the area.

The development will not result in any emissions or waste, to the contrary it will help to reduce the level of CO<sup>2</sup> emissions in the UK associated with electricity generation.

There is a misconception that PV panels might cause adverse glint and glare effects, with reflected sunlight creating a nuisance or even a safety risk for planes or traffic. This is not the case. The panels are designed to absorb as much daylight as possible, and therefore have a low level of reflectivity when compared to surfaces such as window glass, water or snow. Less than 9% of total incident visible light is reflected by PV panels, whereas normal glass reflects about 17%; the image below illustrates the reflection of sunlight from a solar panel.



Studies have shown that PV panels do not create a risk for aircraft or vehicle traffic<sup>1</sup>, due to the absorptive properties and low reflection levels of the panels. In Germany and the USA it is common for PV systems to be installed on airport terminal buildings, or within airport grounds. Therefore, the development will not result in adverse glint and glare effects.

The passive nature and small scale of the proposed development means there will be no significant adverse effects on the local community and it is considered that the installation of PV panels on the roof of the building will not adversely affect the visual amenity of the site or surrounding area

### 3.2 LAYOUT

The PV array will cover a total area of 65 square metres of the roof. The panels will be wholly contained within the existing roof area.

### 3.3 APPEARANCE

The photos below show the appearance of the installed PV on the roof of Mengham Junior School.

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<sup>1</sup> Lightsource commissioned Solar Praxis, a German based company, to undertake glint and glare assessments for two PV projects located within close proximity of airports.



**Image 2: Finished installation on the roof of Mengham Junior School**



**Image 3: Finished installation on the roof of Mengham Junior School**

#### 4 CONCLUSIONS

It is considered that the effects associated with developing a small-scale PV system on the roof of the subject building are minimal and will not adversely impact on the surrounding area. The effects of the PV system will be negligible in nature and contained within the site.

It is considered that the proposed development is consistent with policy objectives, and that planning permission should be granted for the 9.4kW PV system on Mengham Junior School.

## 156 Series Monocrystalline Solar Module

235W, 240W, 245W, 250W, 255W



High Module Conversion Efficiency



Easy Installation and Handling for Various Applications



Withstanding Mechanical Load up to 5400 Pa



Conform with PV Standards: IEC 61215:2005, IEC 61730:2004, UL 1703



ISO9001, OHSAS18001, ISO14001



We provide a 10 years material and workmanship guarantee for our modules. In addition, a 90%-power-output guarantee for 10 years and a 80%-power-output guarantee for 25 years of the modules life are provided.



## 156 Series Monocrystalline Solar Module

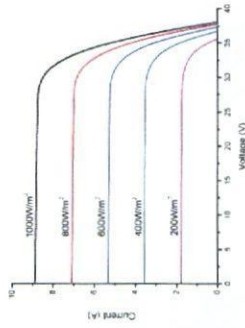
235W, 240W, 245W, 250W, 255W

### Dimension



Drawing Only for Reference

### I-V Curves



### Efficiency at Varied Irradiation

|            |                     |                     |                     |                     |                      |
|------------|---------------------|---------------------|---------------------|---------------------|----------------------|
| Irradiance | 200W/m <sup>2</sup> | 400W/m <sup>2</sup> | 600W/m <sup>2</sup> | 800W/m <sup>2</sup> | 1000W/m <sup>2</sup> |
| Efficiency | 15.7%               | 16.0%               | 15.9%               | 15.9%               | 15.7%                |

### Electrical Characteristics

|                                          | JC35S-24Db | JC40S-24Db | JC45S-24Db | JC50S-24Db | JC55S-24Db |
|------------------------------------------|------------|------------|------------|------------|------------|
| Maximum Power (P <sub>max</sub> )        | 235 W      | 240 W      | 245 W      | 250 W      | 255 W      |
| Power Tolerance                          | ±3%        | ±3%        | ±3%        | ±3%        | ±3%        |
| Module Efficiency                        | 14.46%     | 14.78%     | 15.08%     | 15.38%     | 15.70%     |
| Maximum Power Current (I <sub>mp</sub> ) | 7.98 A     | 8.16 A     | 8.17 A     | 8.26 A     | 8.36 A     |
| Maximum Power Voltage (V <sub>mp</sub> ) | 29.5 V     | 29.5 V     | 30.0 V     | 30.3 V     | 30.5 V     |
| Short Circuit Current (I <sub>sc</sub> ) | 8.56 A     | 8.71 A     | 8.72 A     | 8.78 A     | 8.89 A     |
| Open Circuit Voltage (V <sub>oc</sub> )  | 37.2 V     | 37.2 V     | 37.8 V     | 37.8 V     | 38.1 V     |

Values at Standard Test Conditions STC (Air Mass AM1.5, Irradiance 1000W/m<sup>2</sup>, Cell Temperature 25°C)

### Temperature Coefficient

|                                             |             |
|---------------------------------------------|-------------|
| Temperature Coefficient of Voc              | -0.3109%/°C |
| Temperature Coefficient of Isc              | 0.0348%/°C  |
| Temperature Coefficient of P <sub>max</sub> | -0.4310%/°C |
| Nominal Operating Cell Temperature (NOCT)   | 45°C±2°C    |

### Mechanical Characteristics

|              |                                                         |
|--------------|---------------------------------------------------------|
| Cell Type    | 156 x 156 mm Monocrystalline, 60 (6 x 10) pcs in series |
| Glass        | High Transmission, Low Iron, Tempered Glass             |
| Frame        | Anodized Aluminum Alloy                                 |
| Junction Box | IP65 rated, with bypass diodes                          |
| Dimension    | *1640 x 992 x 40 mm                                     |
| Cable Length | 1000 mm                                                 |
| Weight       | 20 Kg                                                   |

Insulation Hole Location See Drawing Above

### Maximum Ratings

|                            |                            |
|----------------------------|----------------------------|
| Operating Temperature      | -40 °C to +85 °C           |
| Maximum System Voltage     | 1000VDC (EU) / 600VDC (US) |
| Maximum Series Fuse Rating | 20A(EU) / 15A(US)          |

### Packing Information

|                       |       |       |       |
|-----------------------|-------|-------|-------|
| Container             | 20'GP | 40'GP | 40'HQ |
| Pallets per Container | 12    | 28    | 28    |
| Pieces per Container  | 300   | 700   | 770   |