

Report

Overview and Scrutiny for Development & Transport

Part 1

15 April 2009

Item No.06

Subject **Provision of Solar Photovoltaic Farms**

Purpose To inform the Overview and Scrutiny Forum on proposals for achieving revenue savings by installation of a farm of photovoltaic panels on Council property.

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Ward General

Summary This report is to discuss the opportunity to establish “solar” farms on Council owned buildings that will generate and resell electricity to the electricity supply companies. This generated electricity would be “offset” against the electricity charges for the new street lighting system. The provision of these photovoltaic panels would be through a change to the S.38 agreement, whereby a developer would supply and install a panel for every 1-3 street lights fitted on a new development, which would at least equalise the carbon footprint for energy use.

Proposal **To ask the Cabinet Member for Highways and Transport to carry out a feasibility study with Photovoltaic Solar Panel suppliers to investigate potential Council owned buildings for this type of installation.**

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Action by Head of Engineering and Construction

Timetable Immediate.

Signed

1. Background

- 1.1 The Council is endeavouring to make savings in the Corporate revenue budget, to combat the inadequate Welsh Assembly Government settlement. One of the options considered within the sustainable development portfolio is to stipulate through a S.38 that developers supply a photovoltaic solar panel for every 1-3 street lighting units, installed on every new development. These panels would generate electricity which would offset against the electricity costs of specific buildings as a means of offsetting the increased cost to the Authority of adopting a new street lighting system.
- 1.2 Research indicates that although this is a growing market, the only local company operating in this manner is "Gensol" who have carried out an installation on the new Moorland Park Community Centre (within Newport's boundaries). The photovoltaic panels are 1200 x 900 cms and produce 200 watts of electricity at the peak optimum operation. They are normally mounted on a frame supporting 5 of these units, 1000w output at a cost of £5,000-£6,000/kw, with each 1000w unit producing 3750/4000 units of electricity per annum.
- 1.3 The cost of a 200 watt photovoltaic cell is £620.00. The cost of a 1000 watt photovoltaic cell is £3,100.00. The capital cost of a 1000w generator installation is £5,000-£6,000 as a one off which includes frame support electricity inverter cabling from roof to mains input supply. An additional cost for "smart" meters are in the order of £30 per month as a standing charge, this would probably be absorbed in the building supply metering charges.

- 1.4 Payback against generated electricity would be offset by payment for electricity generated:-

Kwh generated = Kw input x hours

Taking the 200 watt panel approx 750 units/annum

Unit rate @ present is 10p/unit ∴ 750 x 10p
Giving = £75 per annum

Offset against use by a 100 watt street light (the most common unit)

Kw used x hrs burning
100 w x 4100 = 410Kwhr/ann
410 x 10p = £41 per annum

For a 400 w street light this would be 4 x £41 = £164/annum

To compare 200w of lamps against 200 watt solar panel £75.00 generated against £82.00 used.

- 1.5 These panels have a 25 year life and as prices for electricity rise, so will the generated cost increase, which will improve the pay back period. At the current income against capital cost (ie £5,500 per Kw installed) the income over 25 years would be £9,375.00 therefore a payback on capital alone of 14.66 years. This cost would be part of the developers input to the system.

2. Potential Options Considered/Available

2.1 Solar Photovoltaic Generation within Newport City

A number of Council premises have been identified as being suitable for the installation of a Farm of solar panels, the desirable criteria being buildings that have a flat or pitched roof with a clear orientation between South East and South West.

If installing on a flat roof building, it is possible to tilt the PV modules to an optimum angle, of around 30 degrees. This will restrict the number of modules that can be accommodated in a given area as the rows of modules need to be spaced sufficiently to avoid casting shadows onto

the row immediately behind, which would reduce its generating capacity. It is therefore more desirable to install solar farms on buildings that have a pitched roof with an angle of between 25 and 35 degrees.

The electricity produced by the PV array can be supplied directly into the building and can either be sold back to the electricity provider or used within the building, as direct supply.

The buildings purpose and operation will usually determine the best use of the energy produced. From those panels for example if the building has a high every day demand such as a leisure centre, then it would be more advantageous to use the direct produced electricity within the building. If the building is for example a school, then it may be more prudent to sell the electricity back to the supplier as the school will be closed for long durations outside of terms, especially during the summer months when electricity production levels are at their peak. In each case, a site survey is advisable to determine the exact layout of the buildings and provide an accurate assessment of the potential for PV modules, estimated energy savings and costs of installation.

Initial assessments indicate the following Council buildings as being suitable for the installation of PV solar farm sites.

- Civic Centre
- Newport Centre
- Wales National Velodrome
- Newport International Sports Village Swimming Pool
- Lliswerry Leisure Centre
- Pill Millennium Centre
- Museum & Art Gallery
- Tredegar House
- Schools & Educational Facilities
- Community Centres
- Solar lighting

2.2 **Civic Centre**

The Civic Centre has large areas of flat and pitched roofs that could accommodate solar PV modules, most suitable being pitched roofs that face south east and south west. There are substantial areas of flat roofs that could be utilised, including the Magistrates Court that has a fairly large area to accommodate solar PV modules. Given the continuous energy use of the Civic Centre it would be ideal to directly draw down the electricity into the building use.

2.3 **The Newport Centre**

This building has a large flat roof area on the main building, area approximately 1700m² with minimal obstructions. The segmented roof above the swimming pool would also be suitable with six of the twelve segments possible locations for mounting PV modules. Again the continuous energy use of this building would deem it suitable for direct draw down.

2.4 **Wales National Velodrome**

The Velodrome has a large flat roof with an area of over 8500m². Although the orientation of the building is not ideal, as the pitch East to West is fairly shallow, the roof could be suitable for a large PV array. More detailed calculations would be required to determine the optimum arrangement and output from such an array. This site is suitable for a direct draw down.

2.5 **Newport International Sports Village – Swimming Pool**

The Sports Village offers an ideal location for a PV array. The swimming pool roof has an almost perfect orientation and pitch for optimum output. It has an area of approximately 2400m² with few obstructions. This site is suitable for a direct draw down scheme.

2.6 **Lliswerry Leisure Centre**

The leisure centre and school buildings have a substantial area of flat roof available for solar PV modules with clear south facing orientation. This site is suitable for a direct draw down scheme.

2.7 **Pill Millennium Centre**

Substantial south west facing pitched roof with no obvious shading issues.

2.8 **Museum & Art Gallery**

Large flat roof area however it seems there are quite a number of obstructions such as sky lights on the main roof area. A site inspection would be necessary to assess the roof properly and its suitability.

2.9 **Tredegar House**

This is a listed structure and grounds and therefore PV installations would be very difficult to achieve planning permission.

2.10 **Schools & Educational Facilities**

Most schools and educational facilities within the city will have some suitable space for a PV array. Schools are an excellent location for renewable energy projects as the educational aspect can be fully exploited.

New school designs can incorporate renewable energy generation schemes.

2.11 **Community Centres**

Community Centres are also good locations for PV installations as they can help to promote renewable energy within an area and help to educate people in sustainability issues.

Moorland Park Community Centre has received confirmation of a 50% grant towards the installation of a PV system from the BERR (DTI) Low Carbon Building Programme.

2.12 **Solar Lighting**

Solar powered street lighting can also be considered on new developments both residential and commercial, within the City together with extended use of solar powered LED sign lighting.

2.13 **Planning Implications**

It is understood that a commuted sum may only be requested for non standard assets such as retaining walls or surface water storage pipes. Street lighting would be classed as standard street furniture. The Civic Centre is a listed building hence this scheme would not be permitted. Also if the developer feels the scheme is too onerous he is entitled to go to judicial review.

2.14 **In Summary**

There are many opportunities within Newport for the use of renewable energy generation, particularly through the on-going regeneration of many parts of the City.

The City's existing, and in some cases iconic, buildings, have great potential to generate renewable energy, through PV installations.

Consideration might be given to the design of new buildings which could accommodate renewable energy generators in the future where clear south facing roofs considered on all new buildings whether or not it is the intention to install solar PV modules during construction or at a later date. Having suitably orientated roofs will make future installation easier and more effective should the building owners wish to install renewable energy generation.

Under the DBERR Low Carbon Building Programme, grants of up to 50% of the cost of installation of solar PV systems can be applied for under Phase 2 of the programme (as in the case of Moorland Park).

3. Preferred Choice/Reasons

- 3.1 To explore the installation of photovoltaic generation initially utilising the flat roof areas on the Civic Centre building. An examination of the infrastructures suitability should be undertaken to calculate the proposed set up costs.

4. Proposals

- 4.1 To initiate a solar “farm” of photovoltaic panels initially on the roof of the Civic Centre.
- 4.2 To change Section 38 and Section 278 agreements to include Solar panels for every street lighting unit supplied and added to the Newport City “Solar Farm” at no capital cost to the Authority. This would contribute to the energy costs of the new street lights.

5. Equalities Impact

- 5.1 N/A.

6. Crime Prevention Impact

- 6.1 The proposal will improve reliability of lighting units as the energy costs would be minimal.

Mandatory Consultation

7. Comments of Monitoring Officer

- 7.1 The implementation of these proposals would need further consideration, in relation to any consents required for the installation of the solar panels in a listed building and also the legality if amending Section 38 and 278 agreements to require developers to install these panels before roads and street lighting can be formally adopted. If the roads are constructed to adoptable standards, then it may not be possible for the Council to impose any additional requirements as a condition of adoption, without the express agreement of the developers.

8. Comments of Chief Financial Officer

- 8.1 I have no objections to the proposal to carry out a feasibility study into the Provision of Photovoltaic Solar Panels. The financial implications of the study will need to be fully considered at the conclusion of the study.

9. Comments of Head of Planning

- 9.1 The principle of installing solar panels on Council buildings is welcomed. Such works will require planning permission and in some cases Listed Building Consent. If a Council building, Listed Building Consent applications would be dealt with by WAG, not the Local Planning Authority. Contrary to Section 2.13, the provision of solar panels on the Civic Centre may be possible. However, it is questioned whether adoption agreements can legitimately be used for works not directly related to the highways impact of a development or adoptability of the roads. Planning contributions under S106 must be directly relevant to address an impact resulting from a development: it cannot be used to fund general Council initiatives. Do similar requirements apply to S38 and S278 agreements? If so, there may be scope to require developers to install street lights with solar panels on (as per rear of Maesglas Shops) within the development itself instead of normal street lights, but not to pay for unrelated developments.