

Taunton Deane Borough Council

Executive – 12 October 2011

Project proposal for installation of a medium sized Solar PV array on a Taunton Deane corporate building or site

Report of the Climate Change Officer

(This matter is the responsibility of Executive Councillor Ken Hayward)

1. Executive Summary

An action in the Council's approved Carbon Management Plan is to "generate Taunton Deane electricity". Over the past months officers have assessed the suitability of several Council buildings and sites as locations for a medium sized solar PV installation. The result of the assessments so far is in favour of the roof of the Station Road Swimming Pool. Initial assessment from a consultant has indicated that an installation of 36kW would provide the best return on investment (11.59% pa) to the Council. Such an installation would cost around £100,000. In order to maximise on the Government's subsidy for generating electricity from Solar PV the installation would need to be completed by 31 March 2012. This presents a tight timeframe. A project plan has been produced and a project team been set up to try to achieve this target.

Corporate Scrutiny Committee on 22 September 2011 considered and supported the project in principle and the Station Road Swimming Pool as the preferred location for it.

2. Background

In April 2010, central Government introduced the Feed in Tariffs (FIT) scheme to incentivise small scale electricity generation e.g. through solar PV installations. The FIT scheme guarantees a minimum payment for all electricity generated from Solar PV over 25 years regardless whether this energy is fed back into the grid or used on-site.

The current rate for feeding electricity back into the grid is £0.031/ kWh, whilst if used on-site it is worth the commercial rate of the electricity that it replaces, i.e. the value of the amount of electricity that doesn't need to get imported from

electricity companies any longer. Government has recently significantly reduced the FIT rates for Solar PV installations above 50kW to discourage large scale installations.

Since the introduction of the FITs, central Government has urged LAs to grasp the opportunity and create income from renewable energy generation. In order to support this it has lifted the ban on the sale of surplus electricity to the grid by councils, which creates the opportunity to potentially raise £100m a year new incomes for councils in England and Wales. Interestingly, South Somerset District Council has just approved the installation of a council funded 40kW Solar PV array on their main council building in Brympton Way in Yeovil.

Tackling climate change by reducing CO2 emissions is one of four corporate priorities for TDBC for the period 2010 to 2013. The Council produces annual Carbon Management Plans to steer this process. A key action in the current CMP – that was approved by the Executive Committee on 10 August 2011 – is “to generate TDBC electricity from Solar PV”. This report is the first step for delivering this action.

3. Full details of the Report

3.1 Defining the best size of installation

An initial quote for a roof-mounted installation of solar PV panels on Station Road swimming pool was received from Rainbow Renewables Ltd. in March 2011. The company modelled different installation layouts for the roof in terms of orientation and tilting of the panels. This exercise resulted in three options. The options have a size of 32kW, 36kW and 69kW. Out of the options, the medium sized installation would deliver the highest rate of return on investment. Table.1 below shows the details for this installation as quoted by Rainbow Renewables¹.

Table.1: Return on medium sized Solar PV installation (36kW)	
Total power output	36.00kW
Total installed costs (ex. VAT)	£100,000
Estimated annual energy performance (kWh)	32,200
FIT rate – Generation	£0.329
FIT rate – Export	£0.031
Estimated annual income from FIT (Generation)	£10,594
Estimated annual income from FIT (Export)	£998
TOTAL	£11,592
Annual return on investment	11.59%
Payback Period (Years)	8.6
Total earnings over 25 years	£289,800

The total earnings from the installation could be higher than in the table above if electricity generated would be sold to a third party at a rate above £0.031.

¹ Figures from original quote have been updated to reflect Retail Price Index adjustments of FIT rates in August 2011.

The costs of the installation would roughly split into £83,000 for the kit and £17,000 for the installation works. The carbon reduction from the installation would be about 19 tonnes of CO2 per year. Full details on the two other two options can be found in 11.2 of the Appendix.

Two other sites have been considered as potentially feasible – Wellington Sports Centre and the DLO Nursery. A 36kW installation on the roof of Wellington Sports Centre is feasible and would give the same returns as in the table above. The roof is capable of carrying the additional weight. However, the roof covering of the Centre needs to be replaced before any installation. This is estimated to cost £100,000 - £150,000, for which there is currently no funding. The Centre has therefore not been considered further.

An installation at the DLO Nursery site would be ground-mounted and wired to provide electricity to the buildings on-site. Rainbow Renewables quoted that for a £100,000 investment they could deliver an installation of about 40kW. The space requirements for a slightly larger, 50kW installation are known to be about 0.2 acres depending on the type of installation.

Two other sites have also been considered – Blackbrook Sports Centre and Deane House. Blackbrook Sports Centre is considered unsuitable because of having a very thin, frail metal roof. A platform would need to be built to carry the installation. The roof of Deane House is pitched and not easy to access. Compared to a building with a flat roof, panels are more difficult to install on a pitched roof and annual maintenance would require scaffolding thus increasing installation and running costs. Both options have therefore been discounted.

3.2 Project Specification

3.2.1 Size of installation

Of the options assessed above, a 36kW installation gave the best return on investment. Any TDBC owned installation should be below 50kW because of the recent drop in FIT rates for installation beyond 50kW. More detailed modelling could be undertaken to find the optimum size of an installation in terms of best return on investment as part of the procurement process.

3.2.2 Funding arrangements

The full funding arrangements for the project will be reported verbally at the Executive meeting. The current proposal is to partly or fully fund the installation from the Climate Change budget.

It is recommended to use the income from the scheme to increase the Council's ability to deliver carbon reduction projects by transferring it into the Climate Change budget.

It is assumed that the installation that gives the Council the best return will cost around £100,000. This can be met either from the climate change budget or a combination of the climate change budget and revenue.

3.2.3 Location of the installation

The suitability of Station Road Pool and the DLO Nursery site have been assessed in order to enable a decision for one site:

3.2.3.1 Station Road Pool

Results of preparational assessments:

- A structural survey of the roof of Station Road Pool was completed in September 2011. The recommendation of the survey is to provide a framework to support the solar panels such as the extra loads are only taken directly onto the main roof trusses. The survey arrived at this recommendation as no information concerning the roof structure could be found in the technical drawings available.
- There is no proximate shading onto the roof from surrounding trees or buildings
- According to Rainbow Renewables Ltd who visited the site on 23 September 2011 it is likely that the cable from the installation can be inserted into the building's consumer board
- Western Power Distribution has confirmed that an installation of 36kW size can be connected to the National Grid with no need for additional cabling
- The TDBC Development Management Team has been consulted 'high level' about the likelihood of needing a planning permission for the installation. The principles are that if an installation is visible and changes the shape of the roof then a planning permission would be required. However, depending on how the installation is sited, it may not be visible from the street level and thus not require permission. Once the detailed design of the installation is known, formal opinion from Development Management will be sought on this. If planning permission is needed, the minimum statutory consultation period for the application will be 28 days.

Advantages of Station Road Pool site:

- A flat roof and easy access
- Roof cover will last for at least 15 – 20 years
- 100% of electricity generated could be used on-site
- Installation may be visible to public

Disadvantages of site:

- Building's future beyond 2026 is uncertain, as the Council's commitment currently doesn't go any further than to retain the site for 15 years

3.2.3.2 DLO Nursery Site

Advantages of site:

- TDBC owns and runs the site, i.e. no negotiations with other parties e.g. about the sale of electricity would be needed
- A ground-mounted installation would deliver a slightly larger installation for the same price, i.e. generate a higher rate of return.

Disadvantages of site:

- A ground-mounted installation could be more open to vandalism
- Mature trees on the edges of the site may overshadow the installation thus reducing its efficiency
- Expansion land for the nursery would be lost through the space taken up by the installation
- The electricity from the installation would exceed the electricity need of the Nursery, i.e. excessive energy would need to be fed back into the grid. As shown above this is not the most economical use of the energy generated.

On the basis of these disadvantages the DLO Nursery site is considered a less suitable location for the installation than Station Road Pool.

3.2.4 Timeframe and Tendering

The crucial date for the project is the 31 March 2012 by when the installation must have been completed and registered in order to maximise the benefits from the FIT payments. After 31 March 2012 the FIT rate paid per kWh will drop from £0.329 to £0.301.

Table.2 below shows the suggested timeframe of the project.

Table 2: Timeframe for project	
Completion dates:	
15 September 2011	Structural survey
15 September 2011	Other assessments
12 October 2011	Executive decision to proceed
End October 2011	Full building condition survey (if needed)
January 2012	Tendering process
February 2012	Planning Permission (if needed)
March 2012	Installation
March 2012	Registration

According to the SWOne Procurement Team a full OJEU isn't required for this size of project and the tendering process is likely to take three to four months. It will be led by the SWOne Procurement Team or the SWOne Property FM team.

As part of the tendering process more refined quotes need to be sought. Any quote should include the costs of maintenance and potential replacements as well as it should factor-in the loss in the efficiency of the panels over 25 years. An expensive part of the installation that is likely to need replacement within the 25 years is the inverter.

The physical process of installing the Solar PV would take about one week and must be undertaken by an MCS (Microgeneration Certification Scheme) certified installer. The DLO is currently not certified under the MCS, which means it couldn't be used for this project.

Any installation needs to be registered for receiving FITs. An installation below 50kW can be registered with MCS within one day.

3.3 Potential risks

3.3.1 Site cannot be used for 25 years

The FITs for an installation are paid for 25 years. The question is what happens if a site does get sold or demolished within this time period. In case of a sale, the installation could be added to the value of the building. In case of demolition, it would need to be assessed whether it is viable to re-install the installation at a different location. The costs for this have been quoted twice the installation costs, i.e. £34,000. There are various options for re-using parts of the installation only as well, i.e. by fitting them on council houses.

If Station Road Swimming Pool is chosen as location for the installation and the pool would shut after 15 years, the installation would already have accrued an income of £173,880 (if installed before 31 March 2012).

3.3.2 Failure of parts of installation

Parts of the installation like the inverter are likely to need replacement over the duration of the installation. Other parts like panels, cabling, etc. could potentially fail as well. An appropriate proportion of the annual income should be set aside to cover those potential costs.

The risk of the Council making a loss on the installation because of the failure of parts is highly unlikely. Even if the installation would need to be fully replaced over the 25 years, the Council should still see a return of around £80,000.

3.3.3 Delay in project delivery

If the installation is not completed and registered by 31 March 2012 the cumulative financial loss over the 25 year period because of the reduction in FIT rates from 01 April 2012 is £22,500 (see Appendices 11.1 and 11.3).

4. Finance Comments

Initial assessment has indicated that an installation of 36kW would provide the best return on investment (11.59% pa) with an annual income of £11,592 over 25 years to the Council.

The aim is to use £55k that were set aside within the Climate Change budget for a new boiler at Deane House for the installation. There is accord between officers and Members of the Carbon Management Steering Group that the existing boiler is not in need for replacement at this stage and the funding should therefore be used for the Solar PV project.

The remainder of £45k will be met from Revenue. Details of this will be confirmed verbally at the Executive meeting.

5. Legal Comments

n/a

6. Links to Corporate Aims

Tackling climate change by reducing emissions from the Council's operations is

one of TDBC's corporate aims.

7. Environmental and Community Safety Implications

The proposed project would reduce the Council's emissions by about 19 tonnes of CO2 per year. This amount is equivalent to the amount of carbon emitted by 3 average households per year.

8. Equalities Impact

No equality impacts can be foreseen from the project.

9. Risk Management

Any risks e.g. from failure of parts of the installation will be factored in from the start. An appropriate proportion of the annual income will be set aside to cover these potential costs.

10. Partnership Implications

TDBC will offer Tone Leisure to use the electricity generated on Station Road Swimming Pool at a price below the commercial rate for electricity, i.e. Tone Leisure will benefit from the project through the purchase of cheaper electricity.

11. Recommendation

The recommendation for the Executive Committee is to approve:-

1. the proposed Solar PV project in principle;
2. the main roof of Station Road Swimming Pool as the location for the installation; and
3. an installation size of about £100,000.

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Appendix

FIT tariffs including Retail Price Index adjustments and Fast Track Review amendments – Tariff rates effective from August 2011:

- 2011/12 Generation tariff for Retrofit installations below 50kW: £0.329 / kWh
- 2011/12 Generation tariff for Retrofit installations above 50kW: £0.19 / kWh
- 2012/13 Generation tariff for Retrofit installations below 50kW: £0.301 / kWh
- 2011/12 & 2012/13 Export tariff: £0.031 / kWh

Full details on the three installations modelled for Station Road Swimming Pool by Rainbow Renewables Ltd in March 2011. Figures from original quote have been updated to reflect Retail Price Index adjustments of FIT rates in August 2011:

	Option 1	Option 2	Option 3
Total power output	31.68kW	36.00kW	69.12kW
Total installed costs (ex. VAT)	£95,000	£100,000	£195,000
Estimated annual energy performance (kWh)	29,500	32,200	56,900
FIT rate – Generation	£0.329	£0.329	£0.19
FIT rate – Export	£0.031	£0.031	£0.031
Estimated annual income from FIT (Generation)	£9541	£10,594	£10,811
Estimated annual income from FIT (Export)	£899	£998	£853
TOTAL	£10,440	£11,592	£11,664
Annual return on investment	10.9%	11.59%	5.98%
Payback Period (Years)	9.1	8.6	16.7
Total earnings over 25 years	£261,000	£289,800	£291,600

Income from 36kW option if installed before 31 March 2012 and if installed between April 2012 and 31 March 2013 (using revised FIT rates):

	Income pa	Earnings over 25 years	Income in YEAR 9 (2020/21)
2011/12 rate	£11,592	£289,800	£104,328
2012/13 rate	£10,690	£267,260	£96,214
Difference	-£902	-£22,540	
Loss in % pa	7.80%		

The table above shows that if installed before 31 March 2012 the installation pays back for itself in YEAR 9 (2020/21). If installed after 31 March 2012, the

installation pays back for itself in YEAR 10 (2021/22). If the installation is delayed until after 31 March 2012 the cumulative loss over the 25 year payment period is £22,500 or 7.8%.