



Title: **Solar Photovoltaics on Public Buildings Project**

Public Agenda Item: **Yes**

Wards Affected: **All Wards in Torbay**

To: **Full Council** On: **13 July 2011**

Key Decision: **Yes – Ref. X11/2011**

Change to Budget: **Yes** Change to Policy Framework: **No**

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1. What we are trying to achieve and the impact on our customers

- 1.1 Recent legislation has opened up significant new opportunities for local authorities to generate revenue from renewable energy. Solar photovoltaic panels (PV) represent an investment opportunity for Torbay Council to generate a guaranteed index-linked income for a period of 25 years. This paper proposes a renewable energy invest-to-save programme for solar PV panels on public buildings and schools, based on the income from feed-in tariffs (FIT).
- 1.2 The main recommendation is that the Council approve a revision to the 2011/12 Capital Plan by inclusion of the project to a maximum sum of £1.8m funded from prudential borrowing. The principle and interest repayment to be financed from revenue income generated from the installation of solar PV panels on 45 schools and public buildings, over 25 years.
- 1.4 An additional revenue budget allocation in 2011/12 of £165k is required for programme development costs (professional fees etc) in order to bring the project to the procurement stage. This is being sought from the Financial Strategy & Change reserve and Local Authority Business Growth Incentive (LABGI) reserve.
- 1.3 Based on PV panels being installed on 45 buildings, the project could deliver total revenue of circa. £4.3m, over 25 years. This represents a net financial benefit to Torbay Council of approx £1.5m, after repayment of the loan and interest. This is from FIT payments alone as other savings will also accrue (e.g. avoided electricity costs). Annual cashflow is positive from year 1. The project

will also save up to 237 tonnes of carbon dioxide a year, helping to achieve carbon reduction targets within the Climate Change Strategy for Torbay 2008-2013 and Carbon Management Plan, and promote the benefits of a low carbon economy.

2. Recommendation(s) for decision

- 2.1 A revision to the 2011/12 Capital Plan by inclusion of the project to a maximum sum of £1.8m funded from prudential borrowing, be approved. The principle and interest repayment to be financed from revenue income generated from the project over 25 years.
- 2.2 An additional revenue budget allocation of £165k in 2011/12 be approved for programme development costs (professional fees etc) in order to bring the project to the procurement stage.
- 2.3 That the Commissioner of Place and Environment, in consultation with the Deputy Mayor and Executive lead for Strategic Planning, Housing & Economy be given delegated authority to approve the final business plan.
- 2.4 That surplus revenue is re-invested in projects identified through the implementation of the Climate Change Strategy for Torbay 2008-2013 and Carbon Management Plan, to be agreed through the Councils Annual Budget process.

3. Key points and reasons for recommendations

This programme aims to achieve the following:

- 3.1 Install Solar PV on a maximum of 45 Torbay Council owned and school buildings.
- 3.2 Provide ongoing revenue and carbon savings for Torbay Council (and others participating in the project) following PV installation.
- 3.3 Demonstrate Leadership within the Bay regarding support for low carbon technology.
- 3.4 Support the work of the Torbay Economic Development Company to promote the growth of a low carbon economy in the Bay.

For more detailed information on this proposal please refer to the supporting information attached.

Charles Uzzell
Commissioner of Place and Environment

Les Crump
Executive Head of Spatial Planning

Supporting information

A1. Introduction and history

- A1.1 The introduction of the Feed-in Tariff (FIT) in April 2010 has meant that investing in PV is financially attractive. Revenue is generated/saved in three different ways:
- i) **Generation Payment:** paid for generating energy, regardless of who uses it. Payments are inflation linked and continue for 25 years. It is these payments that are the basis for financing the project; they will accrue to the Council, and are the main subject of the financial analysis undertaken by Price Waterhouse Coopers LLP (PwC) (see below & Appendix 3). At 2011 prices, relevant tariff rates are 41.3p/kWh for systems up to 4kW; 36.1p/kWh for systems up to 10kW; and 31.4p/kWh for systems up to 50kW.
 - ii) **Export Payment:** paid for exporting unused energy to the grid (e.g. during weekends). This is at a rate of 3p/kWh and is inflation linked. These payments are proportionately much smaller and would accrue to the Council as they are linked to the generation payments.
 - iii) **Avoided import savings:** for every unit of energy generated and used within a building, one unit does not need to be purchased from the grid. The current price for electricity is around 10p/kWh, but this is highly likely to increase over the coming decade, for example, increases of 5% are expected this year alone. The reduced cost of importing electricity is the main benefit for schools and Council tenants participating in the project.

A1.2 Feasibility study

- A1.2.1 A feasibility study was conducted to establish suitability of installing PV on over 250 Council owned properties and Schools (following expressions of interest).
- A1.2.2 An initial appraisal was done on each roof using publicly-available aerial photography and street views. Roofs were rejected at this stage if:
- They are pitched and face north, or are pitched and orientated east-west.
 - They are curved.
 - They are moderately or heavily over-shaded by trees, other buildings or geology.
 - Their area is interrupted repeatedly (dormer windows, chimneys, etc).
 - They were flat and old enough that major refurbishment would be needed within 25 years.
 - Security was considered to be a problem.
 - The latest condition report suggested that substantial work is required.
 - The buildings are scheduled to close in the next few years.
 - Their capacity for solar energy systems has already been reached.
- A1.2.3 Next the capacity for solar PV was determined, and the buildings were listed in order of preference in terms of orientation, pitch, capacity and likely structural suitability.

- A1.2.4 Site visits were then conducted to examine the structure, the covering material, the electrical connections, and the practicality of access and installation.
- A1.2.5 At this stage, several further buildings were rejected. The reasons included:
- The buildings were scheduled to close in the next 6 months.
 - The buildings were scheduled for major refits within the next few years.
 - Over-shading that was not obvious from aerial photography.
 - The roof covering was not suitable for any economical form of fixing.
- A1.2.6 The visits provided important information on potential design details such as inverter locations, meter locations, cable runs, mounting systems, and scaffold access, which allowed estimates of actual install costs to be provided. (Full details of the methodology and site selection is available in the background report Solar PV Feasibility Study, Ecofirst Consult Ltd, June 2011).
- A1.2.7 The results, which are summarised below and in Appendix 1 & 2, were fed into a financial model developed on behalf of the Council by Price waterhouse Coopers LLP (PwC).

A1.3 SUMMARY OF RESULTS

- A1.3.1 The feasibility study identified 45 buildings as being the most suitable for solar PV installation. A large proportion of these are schools (24) with Council offices (8) and leased out buildings (13) making up the remainder.
- A1.3.2 It should be noted that the inclusion of these sites/buildings in the final installation programme is still subject to negotiation, further technical work and subject to planning permission. Therefore the financial analysis below represents the maximum benefit that is achievable.
- A1.3.3 **Generation payments**
If all 45 buildings have PV panels installed upon them by 1st April 2012, the financial analysis indicates that the Council can generate total revenue of approximately £4.3m from generation payments alone (FIT).
- A1.3.4 An investment of approximately £1.5m is required to cover installation costs, with a 20% contingency fund of approximately £300k, bring a total ceiling to borrowing of circa. £1.8m. The amount invested is repaid on an annuity basis over the 25 year life of the project, at an interest rate of 4.45% from the Public Works Loan Board.
- A1.3.5 After deducting these amounts, an excess revenue totalling £1.5m remains. The net present value of this future cash flow is approximately £760k, discounted at 3.5% per annum, representing a significant creation of wealth for the Council. These figures are summarised in table 1 and further details are available in the Appendix 3 and the background paper (Financial Analysis report, PwC, June 2011).

Table 1 – Summary of Costs and Revenue

| | |
|--------------------|--------|
| Installation Costs | -£1.5m |
|--------------------|--------|

| | |
|---|---------------|
| Cost of Borrowing & maintenance | £2.8m |
| Total Revenue | £4.3m |
| Excess Revenue (after capital & interest repaid) | £1.5m |
| Net Present Value (NPV) | £760k |
| Internal Rate of Return (IRR) | 9.12 % |

- A1.3.6 These figures are based on the full list of 45 buildings being included in the final programme. Should fewer buildings be included then both installation costs and revenue would decrease. However, the financial analysis shows that each of the individual buildings in the list generates a positive rate of return on its own merits.
- A1.3.7 It should be noted that this financial analysis does not make allowances for any reduction in the installation costs being achieved by bulk purchasing of PV panels, or any other reductions that could be achieved through a competitive procurement process.
- A1.3.8 **Export payments**
An additional, but small amount of revenue will be generated from exporting electricity back to the grid, that is not used on-site (e.g. during weekends). This has been estimated as an additional **£192,000** over the life of the programme¹.
- A1.3.9 **Avoided import savings**
Further and additional revenue savings will come from avoiding the need to import so much electricity to buildings. Avoided electricity imports have been very conservatively estimated as **£640,000** for the life of the whole programme¹. Further work is required to confirm the level of savings for each building, based on existing consumption patterns and assumptions about future electricity prices. The reduced cost of importing electricity is the main benefit for schools and Council tenants participating in the project.
- A1.3.10 **Carbon savings**
Overall emissions would be reduced by **237 tonnes of Carbon Dioxide Equivalent (CO₂e) per year**. Solar PV installed on all 45 buildings would deploy 502kW_p of new generation capacity, which would generate around 448,300 kWh per year across the whole programme.
- A1.3.11 **Economic Development**
In addition to the direct benefits of the project, there is the potential to stimulate the Torbay economy. For example, by using local installers for maintenance of PV panels. This complements current activity by Torbay Economic Development Company to stimulate growth in the environmental technology sector of Torbay economy, and the recent Regional Growth Fund award to South Devon College to become a centre of expertise in sustainable energy. See also background paper Renewable Energy Report (TDA).

A2. Risk assessment of preferred option

A2.1 Outline of significant key risks

¹ based on 50% usage/export; electricity price of 10p kWh, export tariff of 3p kWh, and; 2% inflation rate

- A2.1.1 Solar PV is intrinsically a low-risk investment based on the 25-year government guaranteed income from feed-in tariffs. The technology is reliable with very low maintenance requirements and is well proven having been in use since the 1960's. All manufacturers provide a 20-25 year guarantee on electrical output.
- A2.1.2 The solar energy resource and annual energy production from solar PV panels is well known and varies only a few percent from year to year due to variations in the weather. Torbay has one of the best solar energy resources in the UK.
- A2.1.3 A detailed risk assessment is available from the report author.

A2.2 Remaining risks

- A2.2.1 **Scale of the Programme** – 45 buildings have been identified as suitable for PV installation. The programme is scaleable, and each building can be viewed as a stand-alone project, as the financial analysis shows that each building generates a positive return on investment.

All buildings are subject to further technical work (e.g. structural surveys) and require planning permission.

Schools and leased buildings make up the majority of the programme and their inclusion is still subject to negotiation and legal agreement. Particular attention will be needed regarding legal agreements and leases due to the different and changing nature of the status of schools (e.g. Academy). The list of schools currently includes Community, Academy, Foundation, Voluntary Aided and Voluntary Controlled schools. If these schools were excluded from the programme then installation costs would be reduced to circa £1.1m, with a corresponding reduction in the revenue received from FIT payments, so that total gross revenue becomes circa £3.1m and total net revenue circa £1.1m. The Internal Rate of Return for this level of investment becomes 8.8%

The inclusion of schools (regardless of status) and leased buildings is of key importance to the programme. There has been positive initial feedback both from schools and tenants following site visit, but it should be noted that schools have only 'expressed interest' in the project at this stage. The benefits to schools/tenants of savings on future electricity costs can be significant, but needs to be quantified in detail. Strong partnerships with schools and agreement from tenants will therefore be important moving forward.

- A2.2.2 **Timescales** – due to the need to negotiate with schools and leaseholders, as well as, undertake further technical, legal and procurement work prior to contract award, there is a risk that any delay to the programme will result in contractors not being able to install before April 2012, due to a likely UK 'rush' to install in Q4 of this year. If this occurs and the project is delayed by a year (so that installation takes place in 2012/13) then there would be a 35% reduction in the revenue received from FIT payments. The Internal Rate of Return (IRR) becomes 7.9%; Net Present Value £495k; with total gross revenue becoming circa £3.9m and total net revenue circa £1.1m.
- A2.2.3 **Resources** – it is essential that adequate resource is made available to undertake the further programme work required. Therefore the revenue

budget proposed, together with the internal resources identified need to be made available for the programme in order to meet deadlines and maximise the benefits outlined in this report.

- A2.2.4 Review of Feed-In-Tariff scheme** - the Government has announced an early comprehensive review of the Feed-In-Tariff. The review will assess all aspects of the scheme including tariff levels, administration and eligibility of technologies. It is due to be completed by the end of 2011, with tariffs remaining unchanged until April 2012. The risk remains that should the installation programme be delayed beyond April 2012 that the Government may reduce the Feed-In-Tariff levels that currently apply to the buildings identified for the PV installation programme.

(Note: A full risk assessment of the proposal including risk mitigation measures is available from the report author)

A3. Other Options

- A3.1 Scaling down the project** – fewer buildings in the programme. Less borrowing required, but correspondingly fewer benefits are realised. There would be the same amount of complexity in the programme (as a range of buildings are still likely to be included e.g. schools, leased buildings and Council occupied sites). The same technical, legal, financial and procurement work would need to be undertaken (just on fewer sites) and there would be some, but not a proportional reduction in project development costs, or the timescales involved.
- A3.2 Rent-a-roofspace approach** - whereby the Council look to the private sector to put up the capital cost of installing PV on public buildings. This is primarily used for the domestic market and the installation company gets the financial benefit from the FIT, with the Council receiving a proportion of low cost electricity generated by the PV panels. This option would mean that no capital outlay would be required from the Council, but would result in a significant reduction in benefits. Similar risks, procurement processes and timetable issues would arise as pursuing the preferred option. There is an additional risk that a private sector company may wish to only install panels on a few buildings (cherry picking) and the Council would have less control and influence over the overall programme.
- A3.3 Do Nothing** – would represent a missed financial, carbon saving and educational opportunity. It would not fulfil commitments under Climate Change Strategy and Carbon Management Plan, and would not demonstrate leadership in this area, or support the development of a low carbon economy for the Bay.

A4. Summary of resource implications

- A4.1** A ceiling of £1.8m prudential borrowing is being sought to finance solar PV installations on Council owned buildings and schools.
- A4.2** An additional revenue budget to a maximum of £165,000 for 2011/12 is being sought for professional fees associates with further project development work in order to bring the project to the procurement stage. This will be required from reserves as other budgets are fully committed. As an invest-to-save programme,

the Financial & Change reserve and Local Authority Business Growth Incentive reserves have been identified as appropriate should the Council approve this budget. Any under spend from the Environment budget at year end 2011/12 will be used to replenish these reserves.

A5. What impact will there be on equalities, environmental sustainability and crime and disorder?

A5.1 The proposals help promote environmental sustainability and are integral to implementing the policy framework document 'A Climate Change Strategy for Torbay 2008-2013', as well as, Torbay Councils Carbon Management Plan.

A5.2 Since schools and leased out buildings are included in the programme, then younger people and a range of Bay businesses will be involved in, and benefit from, the programme. This further supports the Council's diversity and equality aims.

A6. Consultation and Customer Focus

A6.1 This project has not been the subject of formal consultation, however, the following have been contacted to date to discuss proposals:

- Specialist organisations - South West Energy & Environment Group, RegenSW, PV installation companies, PriceWaterhouseCoopers LLP
- Other Councils – Teignbridge, South Hams, Devon, Cornwall, Dorset, Somerset & Bristol.
- Other public sector organisations in Torbay - Schools, South Devon Healthcare Trust, Torbay Care Trust and the Police. Expressions of interest were received from schools in the Bay, who received site visits from technical consultants. Other organisations are also interested in our approach and are exploring similar schemes, although due to the timescales involved will not form part of this programme.

A6.2 Customer focus – The programme will demonstrate value for money through energy management within the Council. Participating schools will benefit from reduced electricity costs, promotion of renewable technology and educational value. Participating tenants will benefit from reduced electricity costs.

A7. Are there any implications for other Business Units?

A7.1 Other business units have been involved in the feasibility stage and will continue to be important in delivering the programme. These include, Asset & Energy Management (TDA); Childrens Services; Corporate Finance; Procurement; Legal Services; Engineering & Structures; as well as Development Management, Building Control and Urban Design teams within Spatial Planning.

Appendices

Appendix 1 – Location of feasible PV arrays

Appendix 2 - List of roofs considered suitable.

Appendix 3 – Financial Analysis (Executive Summary, PwC)

Documents available in members' rooms

A Climate Change Strategy for Torbay 2008 – 2013

Background Papers:

The following documents/files were used to compile this report:

- Project Brief– Solar PV on Public Buildings (PRINCE 2), January 2011
- Solar PV Feasibility Study, Ecofirst Consult Ltd, June 2011 (Commercial & Confidential)
- Financial Analysis report, PwC, June 2011 (Commercial & Confidential)
- Torbay Renewable Procurement Report, PwC, June 2011
- Torbay Energy Services Company Report, PwC, June 2011
- Torbay Development Agency – Renewable Energy Report