DERBY CITY COUNCIL

COUNCIL CABINET
12 April 2011

Report of the Chief Executive

ITEM 12

Photovoltaic (PV) system installation spend to save project

SUMMARY

1.1 This item concerns the approval of a 25 year 'spend to save' project designed to deliver low risk financial returns whilst also providing a reduction in council carbon emissions.

1.2 The project will install a Photovoltaic (PV) electricity generation system at Friar Gate Studios and Springwood Leisure Centre. This is a form of renewable technology that produces AC electricity from solar irradiation without any carbon emissions. The 8 June 2010 Leisure Facility Strategy update to Cabinet notes that consultants PMP Genesis highlighted that of the existing leisure facilities only Springwood Leisure Centre was not ageing or in poor repair.

1.3 The electrical capacity of the system will be 26.5kW peak at the Friar Gate Studios and 90kW peak at Springwood Leisure Centre. This can either be used on site (displacing utility supply and cost) or exported to the grid for revenue income. Electricity generated by the PV system and consumed on site has a value over 2.5 times greater than that not consumed on site and exported to the grid.

1.4 The roof mounted PV array is attached to the existing roof structure by a bespoke lightweight frame. This produces power in direct current (DC) form by converting solar energy directly into electricity. Building Structures team in Neighbourhoods Directorate have, on the basis of information provided and preliminary design checks, reported on the structural feasibility of the sites and indicated that:

- Friar Gate Studios has an existing roof capable of support to the additional loading from PV panels
- Springwood Leisure Centre may require mitigation to reduce wind uplift for one roof area. The second roof area should be reduced to avoid the area of roof that overhangs the eaves.

The project reflects the above findings and has reduced the area of PV on the second roof and includes a risk premium in the capital estimates to cover for any mitigation measures that may be required for the first roof area.

1.5 The project will receive Feed-in-Tariffs (FIT) under new legislation introduced 1 April 2010. These tariffs will provide a revenue income stream sufficient to support the necessary prudential borrowing. The total revenue stream arising directly from the FIT over the borrowing period is projected to be £982,030. The total revenue stream

arising from the combination of on site consumption and exported electricity over the same period is £209,354. (Total revenue income £1,191,384)

1.6 It is proposed that the design and management of the project will be performed by asset management functions within the Strategic Director Neighbourhoods. The fee for this is expected to be 10% of the capital funding requirement.

The design of the PV system at Springwood Leisure will take full account of any plans to develop a swimming pool to ensure that the PV installation is not adversely impacted by swimming pool development. This will include, but not be limited to, i) confirming that the PV system will not require subsequent movement from original installed location, ii) ensuring that entitlement to FITs remain during and after any pool development work.

1.7 The capital unsupported borrowing requirement is £514,800. The interest charge on a straight annuity basis for this borrowing is £540,302. The project is projected to provide an 8.5% Internal Rate of Return (IRR) and provide a positive £12,825 Net Present Value over the 25 years.

1.8 A secondary purpose of the project is to demonstrate that it can be applied to other suitable sites for similar levels of return and risk.

RECOMMENDATION

2.1 To approve the outline project funding estimate required to enable the issue of the Invitation to Tender (ITT) for the installation of PV at Friar Gate Studios and Springwood Leisure Centre.

2.2 To approve the inclusion of the project in the capital programme for 2011/12 and commencement of the scheme.

2.3 To approve the virement of site revenue savings made against displaced utility supply in order to support the borrowing together with the FIT and export revenues.

REASONS FOR RECOMMENDATION

3.1 The Council will benefit by exploiting energy efficient renewable technologies, using carbon neutral technology and provide a strong community lead in demonstrating the potential of renewable technology.

3.2 The Council will benefit from the receipt of generation tariff of £982,030 over the period of prudential borrowing. The level of IRR expected is underpinned by a low risk investment in reliable, proven technology within a simple system installation.

3.3 The FIT legislation allows for the recovery by energy suppliers of the cost of the tariffs paid. This is expected to lead to a 1.5% increase in fuel bills above normal. The installation of PV avoids this cost for the proportion of grid electricity displaced. This in effect leads to the negative NPV of -£162.4k for the Do Nothing option.

SUPPORTING INFORMATION

4.1 The FIT legislation underpinning this business case is the Feed-in-Tariffs (Specified Maximum Capacity and Functions) Order 2010. This order provides the basis of a nationally run scheme to enable the switch to a low carbon economy by providing a support mechanism for electricity generation using renewable sources.

4.2 The £982,030 receipts from the PV generation are modelled on the average level of solar irradiation falling on to the area of PV at each site location. The risk of this falling below predicted levels is considered low. The model have used the site specific orientations, inclinations and installed areas of PV to model the generation outputs.

4.3 The modelling was undertaken using the European Commission (EC) Joint Research Centre (JRC) Photovoltaic Geographical Information System (PVGIS) to provide the predicted generation outputs. The supporting papers business case is based on these predications.

4.4 The JRC also provides a more recent GIS system called SAF PVGIS that they consider more robust. The SAF PVGIS predicts 9% greater generation than the more prudent PVGIS model. Thus the risk that generation will fall below predicted levels is considered low.

4.5 The PV systems will require connection to regional electricity distribution network. The District Network Operator (DNO) must be satisfied that the levels of electrical power we export to the regional distribution network is within the capability of the network. Initial enquires with the DNO indicate that the levels of generation at these sites is acceptable.

4.6 Consideration has been made of the potential conflict between the long life expected from PV systems and the uncertain life of the buildings to which they are installed. Specifically in the case of Springwood Leisure it is unclear if the ultimate take up of any of the potential sites for the indoor and/or outdoor leisure hubs will result in the early disposal of Springwood Leisure Centre.

This uncertainty creates a risk that the investment in any PV installation at Springwood would not have sufficient time to repay and make the expected IRR.

In the event that Springwood Leisure Centre was disposed of before the PV had sufficient time to repay there are three possible financial outcomes:

a) No value is afforded to the PV installations as part of any sale

b) Limited value is afforded to the PV installation as part of any sale

c) Significant or full value is afforded to the PV installation as part of any sale

Bullet a) is not an unusual outcome for many minor non-PV capital works.

Bullet b) is not an unusual outcome for many major non-PV capital works e.g. boiler upgrades, glazing improvements.

Bullet c) is unusual for non-PV capital works especially where there is uncertainty regarding the future monetary and non-monetary benefits derived from the works.

4.7 The installation of PV at Springwood Leisure Centre is likely to fall into the c) category as discussed in 4.6

PV installations differ from other capital works in that the future benefits arising from the installations is clearly identifiable in monetary terms due to the legislation supporting the FIT and the relative predictability of annual solar radiation levels at specific locations.

Thus, a PV installation can be viewed broadly in terms of a financial asset such as a 'treasury bond' whereby the capital cost of the PV is equivalent to the purchase value of the bond and the FIT equivalent to the bond coupon. Similar to a bond a PV system has a clearly identifiable value based on standard financial valuation techniques of the future FIT stream.

Therefore a PV installation is likely to fall in to category c) and is likely to recover significant or full value such that the outstanding borrowing can be significantly or fully repaid on sale.

The modelling assumption for the onsite annual consumption at two sites is set at less than ¼ of that experienced by Springwood. This is considered prudent.

Electricity generated by the PV system and consumed on site has a value over 2.5 times greater than that not consumed on site and exported to the grid. Thus if greater on-site use of consumption is made the modelled returns will be higher.

For example, if 75% of consumption were used on site the project would provide a IRR of 12.3% and provide a positive £35,186 NPV over the 25 years.

The precise levels of onsite consumption possible will be determined before ITT.

4.8 Over the borrowing term the FIT will provide 82% of the project revenue,14% of the revenue will come from the on-site usage of PV generated electricity, and the remaining 4% revenue coming from the export sale of un-used PV generation.

The financial model assumes that only 50% of the PV generation will be consumed on site with the remaining 50% exported. The on-site consumption will displace the site normal energy supply costs with the savings being used as a virement to support the PV borrowing. The sites will not benefit from any budgetary gain nor suffer any budgetary loss – the risks and rewards going directly to the corporate centre.

OTHER OPTIONS CONSIDERED

5.1 A Do Nothing Option has been considered. This returns a negative NPV of -£162,442. In effect the benefit accruing to those who install renewable technology and receive FIT's will be paid for by those who don't claim FIT's. The cost of grid electricity rising by a predicted 1.5% to enable this transfer.

This report has been approved by the following officers:

Legal officer	Stuart Leslie
Financial officer	Ciaran Guilfoyle, Nicola Goodacre, Michael Kirk
Human Resources officer	Rod Wood
Service Director(s)	Steve Meynell
Other(s)	None

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Background papers:	Outline business Case – PV System Installations project at: Frairgate Studios and Springwood Leisure
List of appendices:	Appendix 1 – Implications

Appendix 1

IMPLICATIONS

Financial and Value for Money

1.1 The investment appraisal demonstrates the levels of IRR achieved from a low risk investment underpinned by legislation providing a guaranteed revenue stream.

1.2 The project will payback (discounted terms) the unsupported borrowing of £514,800 in year 22. The IRR is 8.5% with a Project Loan Cover Ratio of 1.13. The interest charge on a straight annuity basis for this borrowing is £540,302.

1.3 The economic life of the assets is in excess of 25 years.

1.4 The fee attributable to Asset Management for delivery of this project is modelled in the investment appraisal at 10% of capital.

1.5 The unsupported borrowing cost of the project is fully funded from the income / power value it generates and hence will not have no direct cost to Council budgets, in addition at the end of the borrowing period, the PV system may continue generating and gaining additional revenue.

Legal

2.1 None directly arising

Personnel

3.1 None directly arising

Equalities Impact

4.1 None directly arising

Health and Safety

5.1 None directly arising

Environmental Sustainability

6.1 This project is enabled by Government renewable electricity generation incentive under FIT and will save some 1,197 tonnes CO2 from being emitted by fossil fuelled power stations over the course of the 25 year project.

The Carbon Reduction Commitment (CRC) scheme is complimentary to FIT scheme

but does not add further incentive to renewable generation beyond the financial tariff available under FIT. Subject to certain eligibility criteria a CRC participant can be issued with Electricity Generating Credits (EGC) that can be used to offset against participants total allowance purchase under CRC. However, if FIT's are claimed the eligibility criteria is not satisfied and no EGC will be issued and thus no reduction in CRC allowance purchase is possible.

This PV project receives FIT's and thus will not reduce the requirement for CRC allowances.

6.2 The project will continue to deliver carbon savings for its whole economic life which can be well in excess of 25 years.

Asset Management

7.1 The installations of PV will be subject to structural survey advice and will require minimal annual maintenance.

7.2 The equipment installed will remain as fixed equipment to the buildings and will in the event of change in ownership transfer with title to new owners. The value of the installation is expected to enhance the sale value of the property in proportion to the anticipated future FIT revenue flows accruing to new owners. The realisation of this future value is expected to provide settlement of prudential borrowing.

Risk Management

8.1 The key risks to the predicted modelled investment appraisal returns are that:

- The site roofs are not structurally capable of support to PV (low risk) A feasibility study (see 1.4) has indicated that one of the Springwood roofs may require measures to reduce wind uplift – a risk premium is incorporated into the capital estimates. If during detailed design it is found that the measures required are not-cost effective the affected roof area can be dropped from the project to maintain the levels of return expected from the remaining roof areas.
- FIT support is withdrawn (low risk)
- FIT fund depletes (medium risk)
- Annual kWh generation falls below predicted (low risk)
- The mix of on-site electricity consumption and exported consumption materially over estimates on site consumption (low risk)
- Maintenance costs are materially higher than estimated. (low risk)
- Springwood Leisure Centre is disposed of before returns are made (low risk of material impact – risk mitigated by nature of FIT revenue stream)

8.2 These risks will be kept under review.

Corporate objectives and priorities for change

9.1 The project relates to Derby City Councils corporate plan and vision: city Growth CG5 Reducing CO2 emissions.