

APPENDIX C

CAPITAL INVESTMENT FOR STREET LIGHTING, SOLAR PV AND BOILER REPLACEMENT



CABINET MINUTES 142 AND 142a OF 12 FEBRUARY 2013

CAPITAL INVESTMENT FOR STREET LIGHTING, SOLAR PV AND BOILER REPLACEMENT

The Directors for Place and Corporate Services submitted a written report seeking approval for a £13.25 million capital investment as part of an energy and carbon saving programme, to -

- replace the authority's high pressure sodium street lamps with light emitting diode (LED) street lamps;
- install solar photovoltaic (PV) panels on 14 council owned buildings (see Annex 1 for buildings)
- replace boilers that are past their usable life in 16 council properties (see Annex 2 for properties).

Councillor Lowry (Cabinet Member for Finance) presented the report.

Councillor Coker (Cabinet Member for Transport) thanked the officers for their work on the proposals which would make the council greener and guarantee the provision of street lights to make the city safer.

Alternative options considered and reasons for the decision –

As set out in the report.

Cabinet noted the inclusion of the revenue and capital implications within the 2013/14 Revenue and Capital Budget.

Agreed that subject to the City Council's approval of the capital investment, the proposals for street lighting, solar pv panels and boiler replacements are approved.

(See also minute 142a below)

142a **Capital Investment for Street Lighting, Solar PV and Street Lighting: Recommendation to the City Council**

Further to minute 142 above,

The City Council is Recommended to approve a £13.25 million capital investment to –

- (1) replace the authority's high pressure sodium street lamps with light emitting diode (LED) street lamps;

- (2) install solar photovoltaic (PV) panels on 14 council owned buildings (see Annex 1 for buildings);
- (3) replace boilers that are past their usable life in 16 council properties (see Annex 2 for properties).

Note:

The full report in connection with this minute is available on the website

www.plymouth.gov.uk/democracy

or by contacting Democratic Support on 01752 304867

PLYMOUTH CITY COUNCIL

Subject:	Capital Investment for Street lighting, Solar PV and Boiler Replacement
Committee:	Cabinet
Date:	12 February 2013
Cabinet Member:	Councillors Lowry and Coker
CMT Member:	Anthony Payne (Director for Place), Adam Broome (Director for Corporate Services)
Author:	Alex Hurth
Contact details:	T. 01752 30775 E. alex.hurth@plymouth.gov.uk
Ref:	
Key Decision:	Y
Part:	Part I

Purpose of the report:

To seek approval for a £13.25 million capital investment to:

- (1) Replace the authority's high pressure sodium street lamps with Light Emitting Diode (LED) street lamps
- (2) Install Solar Photovoltaic (PV) panels on 14 Council owned buildings (see Annex 1 for buildings)
- (3) Replace boilers that are past their usable life in 16 Council properties (see Annex 2 for properties)

This is part of an energy and carbon saving programme, the objectives of which are to reduce the Authority's dependence on fossil fuels, realise cost savings and generate income. In addition, to create a positive impact on the reputation of Plymouth City Council as an organisation continually searching for sustainable solutions to provide for its needs.

Corporate Plan 2012 – 2015:

The projects support the following Corporate Plan long-term and medium-term outcome measures:

Raise aspirations

- Overall / general satisfaction with local area
- Rate of anti-social behaviour incidents per 1000 population

Provide value for communities

- Increase customer satisfaction with all public services offering VFM
- Per Capita CO₂ emissions in the LA area
- CO₂ reduction from public sector operations

Reduce inequality

- Narrow the gap in overall crime between the city average and most deprived neighbourhoods
- Reduce harm from interpersonal violence domestic violence and sexual violence

Implications for Medium Term Financial Plan and Resource Implications: Including finance, human, IT and land:

The cost of the £13.25m capital investment will be met through prudential borrowing, with repayments over the estimated 20 year life of the projects. The annual borrowing repayments of £0.988m per annum will be met from the existing service budgets, utilising the savings noted. After repayment of the original loan and interest, these projects will have an estimated net revenue benefit including cost avoidance of £29.4 million over the measures' life (20 years).

Other Implications: e.g. Child Poverty, Community Safety, Health and Safety and Risk Management:

LED Street lighting is known to reduce the fear of crime and to improve road safety

Equality and Diversity:

Has an Equality Impact Assessment been undertaken? Yes

Recommendations and Reasons for recommended action:

That Cabinet –

(1) seeks approval for a £13.25 million capital investment to:

- replace the authority's high pressure sodium street lamps with Light Emitting Diode (LED) street lamps;
- install Solar Photovoltaic (PV) panels on 14 Council owned buildings (see Annex 1 for buildings);
- replace boilers that are past their usable life in 16 Council properties (see Annex 2 for properties);

(2) notes the inclusion of the revenue and capital implications within the 2013/14 Revenue and Capital Budget.

The measures outlined overall provide positive revenue benefit/cost avoidance whilst also providing real, measurable benefits for Plymouth Residents and the Authority. In addition the measures proposed also enhance the Council's reputation as a sustainable organisation supporting a low carbon city. The Carbon reduction programme will help the Council reduce costs by an average of £1.5 million per year over the next 20 years which would equate to around £13 cost avoided per annual council tax bill¹. It would reduce CO₂ by 3,200 tonnes per year, providing a substantial contribution towards the Council's ambitions of becoming carbon neutral.

Alternative options considered and rejected:

- Partial energy reduction measures have been considered for streetlighting, but rejected because the benefits achieved through such measures do not compare favourably with the proposed measures.
- Solar thermal (hot water) panels have been considered instead of solar PV but rejected due their limited applicability and reduced pay back

Published work / information:

Background papers:

Title	Part I	Part II	Exemption Paragraph Number							
			1	2	3	4	5	6	7	
Equality Impact Assessment	x									

Sign off:

Fin	AF/ CorpsF FC1213 001.29.01.1 3	Leg	TH0 079	Mon Off	TH0 079	HR		Assets	CJT /115 /280 113	IT		Strat Proc	JK/SP U/CP/ 313/0 113
Originating SMT Member: Malcolm Coe													
Has the Cabinet Member(s) agreed the content of the report? Yes													

1. Background

As evidenced by a recent report published by the UK Committee on Climate Change (May 2012), local authorities play a crucial role in meeting national carbon reduction targets (<http://www.theccc.org.uk/reports/local-authorities>).

In recognition of this role Plymouth City Council is committed to cutting emissions from its own buildings and operations. Substantial progress has already been made through the Carbon Management Programme led by the Corporate Services directorate. The Authority's CO₂ emissions have reduced by over 9% since 2009/10 and we rank among the top 20% in the 2011 UK wide Carbon Reduction Commitment Energy Efficiency Scheme Performance League (<http://crc.environment-agency.gov.uk/pplt/web/plt/public/2010-11/CRCPerformanceLeagueTable20102011>). This has been achieved through projects such as installing energy efficient lamps in office buildings, schools boiler replacement programmes, the accommodation strategy, improved utility management through the corporate landlord initiative, reducing our fleet and using more efficient vehicles.

This paper proposes a programme of works, which will enable the Authority to meet its carbon reduction target of 20% by 2014/15 from 2009/10 levels, whilst generating significant revenue benefits in light of increasing energy prices. Moreover, the programme will also provide real, measurable benefits for Plymouth Residents.

This work also directly relates to the Council's Greener Plymouth commitment pledges to set a 'target of cutting carbon emissions with the medium-term aim of making Plymouth a carbon-neutral Council'.

2. Proposed Measures

The measures proposed are:

- (1) Replace the Authority's sodium pressure street lamps to Light Emitting Diode (LED) street lamps
- (2) Install Solar PV on 14 Council buildings
- (3) Replace boilers that are past their usable life in 16 Council properties

2.1 Street lighting Replacement Programme

Assessment of Needs

Plymouth City Council has seen energy prices increase by over 20% since August 2010. At the same time the Authority is under pressure to reduce costs and increase revenue streams in the wake of the Comprehensive Spending Review. Installing LED street lighting will mitigate the risk of increasing energy prices as it will realise savings in energy and maintenance when the Local Authority is experiencing substantial financial pressures. This project is also directly addressing concerns about crime and road safety as the 2012/13 Household Survey has highlighted. Moreover, Plymouth City Council will be giving a positive environmental message to the rest of the City by reducing its energy consumption and therefore its carbon footprint.

Key Benefits

The majority of Plymouth's street lights use high pressure sodium (SON/T) lamps. Such lamps have been the first choice in street lighting for many years as they provide high levels of light in relation to the energy used.

SON/T lamps have a low colour rendering which accounts for the distinctive yellow glow they produce. Colour rendering is a measure of the ability of a light source to reproduce the colours of various objects faithfully in comparison with an ideal or natural light source.

The colour rendering of lamps is measured by a colour rendering index, Ra, the lower the number, the poorer the colour rendering. SON/T lamps have a typical Ra of 25, however, LED lamps produce a white light which has a significantly higher Ra value providing colour rendering similar to that of daylight.

White light has been shown to improve visibility for drivers, who are better able to detect roadside movement faster and at a greater distance. Additionally, it has been found to be easier to distinguish objects, colour and people (particularly facial recognition) thus helping to reduce anxiety levels at night. As a result, it is anticipated that many people will feel safer where white light is used.

Until recently, the trade-off for improved colour rendering has been increased energy consumption. However, advances in technology have made white light products more efficient and accessible in terms of cost.

LED lighting is not only the most energy efficient of the white light products, it is also significantly more energy efficient than traditional lighting. Consequently, replacing existing street lighting with LED lighting will significantly reduce both energy bills and carbon emissions. LED costs, whilst still relatively high when compared to other types of lamp, have been steadily decreasing as technology has improved and take up by local authorities has increased. It is anticipated that LED street lights will be the prevalent technology in the United Kingdom particularly as they offer the potential for savings in revenue maintenance in addition to reduced energy costs.

Plymouth City Council has installed approximately 150 LED luminaires in the past 3-4 years for general maintenance purposes. Because of the nature of the installation, i.e. on an ad-hoc basis as old equipment has failed, it is not possible to gauge the overall effectiveness of the lighting, or the level of customer satisfaction. However, it is encouraging that there have been no failures or any negative feedback.

White light sources have also been used on a larger scale as part of the city's Devonport Regeneration Project. Whilst not LED technology, the luminaires used provide a white light similar to that provided by LEDs. Again, there has been no negative feedback from residents.

Nationally, some local authorities have already undertaken to replace, or are considering replacing, their existing street lighting stocks with LED lighting.

For instance, Birmingham City Council has started to upgrade its existing street lighting stock of 95,000 street lights, of which 41,500 will be replaced by LED lighting by 2015. In a recent customer survey undertaken on behalf of Birmingham City Council in relation to LEDs:

- 86% thought the brightness level was about right
- 90% liked the new lights
- 84% thought that houses are now safer
- 89% thought that roads are now safer

Gateshead Council has recently embarked on the procurement of 22,400 LED luminaires, whilst Sheffield Council will shortly be undertaking a similar replacement programme.

Other Authorities considering LED replacement projects include Gloucestershire County Council (50,000 street lights), Wiltshire County Council (40,000 street lights) and Somerset County Council (30,000 street lights). Consultants at Gloucestershire have produced an initial business case which shows a payback period of less than 10 years with an estimated return of investment of as much as

15%. With energy costs set to rise and with background pressures of climate change initiatives and carbon reduction targets, as well as the forecast for continued pressures on revenue budgets and government funding for the medium term, Gloucestershire is seeing LED lighting as a common sense solution to making efficiencies.

The 'Lighting The Clean Revolution' report supported by the HSBC Climate Group references 15 LED street lighting trials across 12 cities internationally.

In the four cities where public surveys were conducted (London, Sydney, Toronto and Kolkata) residents, drivers, pedestrians and shopkeepers all expressed a strong preference for LED lighting compared with the conventional high pressure sodium lighting in their neighbourhoods. In three cities, 70% to 80% of respondents said they felt safer with LED lighting. Majorities ranging from 68% to 90% showed support for LED rollout across their cities, with very few negative responses.

Energy savings in the trials varied from 18% to 85%, with 20 out of 27 products trialled achieving savings of 50% or more, and ten showing savings of 70% or more. A key reason for the LED luminaires' superior energy performance is the inherent directionality of LED devices, resulting in more of the light emitted reaching the surface of the road.

Out of 533 LED luminaires tested, only six units failed (due to defects unrelated to the LED units) over 4,000 to 6,000 hours of use (just over 1%).

Success Factors

The most obvious, and most easily measured, factors of success will be the achievement of reduced energy costs, emissions and maintenance. This is in addition to the mitigation of energy price increases forecast. These factors can be easily monitored and reported through asset system data reporting and financial reporting respectively, and are wholly objective. Clearly, the Council's carbon footprint, which is linked to energy use, will also serve as an indicator.

Public perception, whilst less objective, will provide an indication of the success of the project. This will require carefully prepared surveys to gauge the effectiveness of the project in providing customer satisfaction. It is important to note that this project is directly addressing concerns about crime and road safety as the 2012/13 Household Survey has highlighted.

Over the longer term, it will be possible to understand the effect that the LED lighting has had in reducing road traffic collisions. This will be achieved by reviewing the difference between the baseline statistics, i.e. those at the time of the lighting installation, and those three years after, taking into account causal factors.

The economic and social benefits of LED technology are already well understood, i.e. reducing energy use (and thereby reducing costs), reducing the fear of crime and improving road safety, and LED lighting has been used in Plymouth in isolated areas of the city for the past four years. The Authority is undertaking a LED street lighting trial during the months of January and February to gauge the public's perception of the new lighting over a wider area. The response from the trial will help to guide the wider roll out of the technology by addressing specific concerns, informing the future specification of the technology and assisting with specific siting issues should the project be approved.

2.2 Solar PV Installation Programme

Electricity generated by solar PV panels qualifies for a financial incentive called Feed in Tariff (FIT). The FIT is a 20 year inflation adjusted income for electricity generated by renewables from the date they are installed. In addition to the FIT, solar PV also reduces the need for electricity from the national grid for the buildings on which it is installed. It is widely accepted that the price for electricity and energy as a whole will continue to increase in the future.

Assessment of Needs

Installing PV on Council buildings will mitigate the risk of increasing energy prices. At the same time such installations will realise savings and generate income at a time when the Local Authority is experiencing substantial financial pressures. Moreover, Plymouth City Council will be giving a positive environmental message to the rest of the City by installing solar PV on its roofs.

Constraints and Dependencies

The installation of Solar PV supports the Council's carbon reduction initiatives. It has no negative bearing on other current energy projects such as the Energy Co-operative or the ESCO. It even provides a ready platform for a potential future Council facilitated Energy Co-operative to issue solar PV shares from installations on Council buildings to its members. The impact on corporate energy procurement through hedging has been considered and sufficient allowance made for a variation in corporate demand in line with prospective energy generation through PV panels.

The corporate buildings identified are likely to be in the estate in the longer term and there are no known disposal or regeneration plans. Continuing on-going strategic fit with our planned initiatives will be ensured.

2.3 Boiler Replacement Programme

The objective of the project is to replace outdated gas boilers and electric heating in Council properties with condensing gas boilers. This is in order to reduce the Council's dependence on fossil fuels, realise cost savings and have a positive impact on the reputation of Plymouth City Council as an organisation continually searching for sustainable solutions to reduce its carbon footprint. A secondary objective is also to reduce the financial, business continuity, legal and reputational risks associated with using heating equipment that are inefficient and beyond its recommended useful life.

The chosen properties are heated with life expired heating systems which are uneconomical to run. Due to their age and condition they constitute a maintenance liability, a reliability and safety risk in turn creating a business continuity risk. The current maintenance budget does not allow for replacement of the equipment.

Assessment of Needs

This project addresses the Authority's need to mitigate increasing energy costs. At the same time the project mitigates sudden boiler failure, which could have grave business continuity, reputational, financial and legal repercussions, e.g. failure of Windsor House or City Business Park boilers in winter 2013/14. At the same time such installations will realise savings from maintenance and repair costs at a time when the Local Authority is experiencing substantial financial pressures. . Moreover, Plymouth City Council will be giving a positive environmental message to the rest of the City by installing efficient heating systems.

Constraints and Dependencies

The installation of energy efficient heating systems supports the council's carbon reduction initiatives. The project will ensure compatibility with a potential future district energy network, by ensuring that boiler installations are future proofed for district energy connection. The impact on corporate energy procurement through hedging has been considered and sufficient allowance made for a variation in corporate demand. The corporate buildings identified are likely to be in the estate in the longer term and there are no known disposal or regeneration plans.

3. Options Appraisal

3.1 Street lighting Replacement Programme

Option one – do nothing, i.e. continued reliance on existing lighting technology

By continuing to rely on existing street lighting technology, the Authority will forego net revenue savings including cost avoidance totalling £28 Million over 20 years. In addition there will be no reputational benefit, no carbon reduction and less protection against ever increasing energy costs.

Option two – replace all street lights with LED luminaires

It is estimated that that this option will provide a net revenue saving/cost avoidance of £ 28 million over 20 years. The Council will also gain the reputational and financial benefits outlined in this business case at minimal risk.

Option three – take other energy savings measures on the street lighting

This option allows for the installation of energy saving equipment in to the existing street lighting luminaires. This includes dimming equipment and photoelectric cells with rationalised switching ratios (see 'Additional Information', below). Whilst this option provides for reasonable energy savings with a pay back over 8-9 years, the savings available are significantly lower than those provided for with LED equipment. Furthermore, as existing luminaires will be used, this option will not have the benefits that the Authority would otherwise expect to gain from white light.

Preferred Option

Option Two is the Preferred option. The scheme is self-financing, and it is anticipated that the total net savings and cost avoidance generated will be 28 Million. Savings will cover capital and interest repayments (over 20 years).

The scheme may also provide less quantifiable indirect cost savings for the Authority's partner organisations (Police, NHS etc.) through reductions in accidents and crime, a prime concern raised by households in the latest Household Survey.

Additional Information

Consideration has been given to incorporating technology from Option 3 in to the preferred option to maximise the energy savings. This includes photo electric cells (PECs) and dimming equipment.

PECs are light operated switches. They switch street lights 'on' when the light level falls beneath a given value (usually at dusk), and switches them 'off' when it rises above another level (usually at dawn). The ratio between the two light levels is known as the switching ratio.

In Plymouth the switching ratio is typically set to 70:35. Guidance from the Institution of Lighting Engineers (ILE) estimates that if the switching levels were reduced to 35:18 a saving of 50 hours per lamp per annum could be achieved (approximately 1-2% energy saving). This reduction in operational hours of the lamp would also reduce the chances of premature failure towards the end of its life.

PEC's are relatively low value items, and Option 2 (preferred option) assumes that the new LED luminaires will be equipped with new cells.

Technology is available to reduce light output at different times of the night offering additional energy savings. The installation of dimming equipment in the new LED luminaires would enable lighting levels to be gradually reduced to a pre-defined minimum at the dead of night and to increase towards dawn as streets become busier.

Dimming equipment has not been incorporated in the business case. However, it is proposed that the procurement will require this element to be priced as an optional extra for main road lighting (where the greatest benefit may be achieved). Consideration will be given to including this equipment in the final procurement subject to affordability and to it having sufficient potential for energy saving over and above that already achieved through the installation of LEDs.

3.2 Solar PV Installation Programme

Option One – do nothing – continued reliance on fossil fuels

By continuing to rely on electricity through the grid for the above buildings the council will forego substantial income and revenue benefits over 20 years. In addition there will be no reputational benefit, no carbon reduction and less protection against the ever increasing cost of fossil fuels.

Option Two – install PV panels – recommended option

By installing PV panels to the recommended properties, the Council will gain the reputational and financial benefits outlined in this business case at minimal risk.

Option Three – install other renewables measures

With the exception of solar thermal panels, the installation of PV does not prohibit the installation of additional renewable measures to suitable properties. Solar Thermal panels have been discounted as they only address the building hot water requirements, which is minimal compared to the requirements for electricity.

Wind turbines, as an alternative electricity generator, have also been considered, but discarded on account of their poor performance in an urban environment, as well as their potential for public controversy and planning restrictions.

3.3 Boiler Replacement Programme

Option One – do nothing – continued reliance on outdated boilers

Status quo does not offer mitigation of the risk of rising energy prices and maintenance costs. Moreover, by continuing to rely on boilers which are past their expected usable life, the Council risks a sudden high not-budgeted-for financial pressure as well as business continuity and reputational repercussions.

Option Two – install new gas boilers in selected council properties – recommended option

By installing gas boilers in selected properties, the Council will mitigate the risk of rising energy and maintenance costs. In addition it will make a contribution to carbon reduction in Plymouth through reducing energy use. Replacing redundant boilers will also mitigate sudden not-budgeted-for financial pressures as well as ensure business continuity.

Option Three – install other boilers (e.g. renewables such as biomass)

Installing gas boilers offers the greatest financial benefit to the authority. The heating requirements, locations and cost benefits are not suited to the installation of biomass boilers. Other heating sources, such as ground or air source heat pumps have also been discounted as the least financially viable heating options.

4. Finance

Prudential borrowing was selected as the most suitable financing option to maximise the Authority's revenue benefits. Repayments will be met from within the budgets (Street Lighting, Energy, and Maintenance) where compensatory savings in energy use and maintenance are expected.

Please refer to the table below for estimated costs/savings. It is important to note that whole life cost savings that are expected to be generated by this project represent a combination of both "cashable" reductions against existing budgets and avoidance of future cost pressures. There is a significant difference between the two.

In relation to the major street lighting intuitive analysis shows:

- The annual cost of meeting borrowing repayments for streetlighting over a 20 year period will be £ 866,000
- Total savings (in Energy, Maintenance and Carbon Reduction) are estimated to be approx. £2.2 million (average p.a. over a 20 year period)
- Total "cashable" budget reductions are estimated to be approx. £ 919,000 p.a. (at 2014/15 prices)
- Due to recent increases in energy prices there is currently a significant budget shortfall associated with street lighting energy use.
- Existing budgets do not provide for the Carbon Taxation associated with street lighting (as this will not be levied until the 14/15 financial year), therefore savings related to this are not "cashable"
- Therefore, despite the high cost avoidance/total saving identified in the table the net "cashable" saving per annum (after payment of loan and interest) is approx. £ 53,000.

Project	Objectives	Project Value	Net Revenue Benefits including Cost Avoidance over Life (20 years)	Loan Duration	Notes
4.1 Street lighting Replacement Programme (Start March 13, End March 16)	To replace the Authority's 28,000 pressure sodium streetlamps with Light Emitting Diode (LED) lamps in order to reduce the Authority's CO ₂ emissions and energy costs. Additional benefits to the lamps are a reduction in the fear of crime and increased road safety.	£11.580 million	£28 million	20 years	Approval of this project subject to (a) successful trial and (b) assessment made on joint procurement with Gloucestershire LA
4.2 Solar PV Installation Programme (Start March 13, End April 14)	To install Solar PV arrays on 14 Council properties in order to reduce the Authority's CO ₂ emissions and energy costs, and to show leadership in adopting renewable technologies.	£0.884 million	£1.7 million	20 years	
4.3 Boiler Replacement Programme (Start March 13, End October 13)	To replace boilers in Council properties which are past their usable life in order to reduce the Authority's CO ₂ emissions and energy costs. An additional objective is to mitigate financial, legal and reputational risks associated with sudden boiler failure.	£0.785 million	-£0.280 million	20 years	The £280K shortfall will be met from the Corporate Maintenance budget
		£13.249 million	£29.42 million		

5. Risks

	Risks	Mitigation
5.1 Street lighting Replacement Programme	<ol style="list-style-type: none"> 1. Public perception that the Authority is wasting money 2. Problems with supply and demand of the LED equipment affects delivery programme. 3. Maintenance savings may not be fully realised as these will be subject to tendered prices. 4. Premature failure of LED equipment reduces confidence in the project. 5. Programme Delays 6. Actual prices received exceed budgeted costs 7. Energy price inflation does not behave in the predicted manner (5% increase p.a.). 	<ol style="list-style-type: none"> 1. Develop a well-considered Communications Plan to communicate the reasons for, and benefits of, the project 2. Provide a clear delivery/installation programme to manufacturer/installer following agreement with both parties in respect of their capabilities. Close project management by Client. 3. Engage with other Local Authorities using LED technology to inform maintenance specification, i.e. determine most cost effective maintenance regime. 4. Early engagement with manufacturers and other Local Authorities to inform specification. 5. Close project and contract management. Incentivisation of installation contract. 6. Close liaison with suppliers, review of costs 7. Unable to mitigate, however, the assumption of 5% price increase is cautious in view of recent price increases experienced by the Authority.
5.2 Solar PV Installation Programme	<ol style="list-style-type: none"> 1. Unable to secure building approval , planning and/or listed building consent on selected properties 2. Roofs/buildings selected are unsuitable following a structural survey 3. Actual quotations exceed budget cost 4. FIT change results in lower income not covering loan repayments 5. Energy price inflation does not behave in the predicted manner - unexpected technological developments reduce energy costs (e.g. Shale Gas) 	<ol style="list-style-type: none"> 1. Consider installation of PV on a different council building or scale down the installation size 2. Close liaison with property team to determine suitable roofs. Selection of alternative roofs 3. Close liaison with suppliers, market testing and review of costs 4. Assess new FIT level in May 2013 and apply to loan model. If this makes project not viable abandon/change/ scale down project. 5. Unable to mitigate, however the assumption of a 5% price increase is cautious in view of recent price increases experienced by the authority. It does however not mitigate against major technological shifts which may affect market prices fundamentally (e.g. Shale Gas). Conversely, cost avoidance for price increases above 5% need to be monitored and reported on during the projects life.
5.3 Boiler Replacement Programme	<ol style="list-style-type: none"> 1. Buildings selected unsuitable due to changing strategic fit with accommodation strategy 2. Boiler replacement reveals or causes other building defects 3. Actual quotations exceed budget cost 4. Energy price inflation does not behave in the predicted manner - unexpected technological developments reduce energy costs (e.g. Shale Gas) 5. Boilers require burner replacement half way through their usable life.. 	<ol style="list-style-type: none"> 1. Property removed from the project 2. Allow for contingency following tender pricing returns - remove buildings which have serious defects preventing boiler replacement from the programme 3. Close liaison with suppliers, market testing and review of costs 4. Unable to mitigate, however the assumption of a 5% price increase is cautious in view of recent price increases experienced by the authority. It does however not mitigate against major technological shifts which may affect market prices fundamentally (e.g. Shale Gas). Conversely, cost avoidance for price increases above 5% need to be monitored and reported on during the projects life. 5. This risk has been quantified at £ 51,000 and will be met from the maintenance budget

6. Procurement

There are a number of possible procurement options to achieve the main drivers of economic and carbon savings. Engagement with the market (subject to capital delivery board business case approval) via a prior information notice (PIN) and market engagement will allow for a more in depth appraisal of which option is most beneficial to the Council. The procurement route will seek solutions that can look at a range of benefits such as low carbon and, in respect of street lighting, future opportunities for wireless broadband connectivity. The options considered for the various capital initiatives are outlined below:

6.1 Street lighting Replacement Programme

Three procurement options have been identified. The final decision on which option is being chosen is subject to further market engagement. Discussions with other Local Authorities will inform whether a joint procurement is feasible and/or beneficial.

Option One – Supply Only

The Authority would tender for the supply of the LED luminaires, indicating the volume required and providing a proposed delivery plan. Installation and ongoing maintenance will be the responsibility of the street lighting contractor through a new street lighting maintenance contract tendered in tandem with the LED procurement. Rates for the installation would be included in the new maintenance contract. This approach would ensure the best price for the LED equipment as it would be purchased at source without any additional overhead cost added on.

In terms of the ongoing maintenance of the LED luminaires, as the maintenance contractor will be installing the equipment, he will be available to correct any defects arising from the installation. This incentivises higher quality installation.

There is the potential for the Authority to be caught between the supplier and the installation contractor should any defects arise i.e. if there is a disagreement in respect of whether a defect is due to the quality of the product or the quality of the installation.

The Authority will need to be clear about its expectations in terms of delivery and installation and this will need to be carefully managed by Council officers. The Authority would want to ensure that manufacture and delivery of the LED equipment was properly optimised around the installer's capabilities and vice versa.

Procurement will be undertaken in two or three phases (or lots) in order to take advantage of falling prices associated with what is still relatively new technology. Furthermore, given that there is a difference in the design of LED street lighting technology for residential and main roads, it would be desirable to procure the two types separately to ensure that the manufacturer best placed to provide the lighting is chosen.

Option Two – Supply and Installation

The Authority tenders for both the supply and installation of the LED luminaires. The supplier may or may not have an in-house capability for installing. If it does not, it is likely that the supplier would sub-contract the work to a third party installation contractor. Alternatively, bids might be received from installation contractors with a manufacturer in its supply chain. In this instance, the bidder may apply an additional percentage increase to the base price of the LED equipment. There would be less transparency of cost with this scenario.

A supply and installation contract would place the responsibility for any defects solely with the contractor, as he would be responsible for the quality of the both product and the workmanship of the installation.

The ongoing maintenance of the equipment would be the responsibility of the street lighting contractor through a new street lighting maintenance contract tendered in tandem with the LED procurement.

It should be noted that there may be an additional cost for the maintenance contractor to undertake a site acceptance for the new equipment before he is comfortable with maintaining the equipment. Site acceptance would be important as it would limit the risk of conflict between the installation contractor and the maintenance contractor should any defects arise. As with supply only, it would be necessary to procure in a number of lots.

Option Three – Supply, Install and Maintain

In this scenario a supply, installation and maintenance contract would be tendered in a single procurement exercise. An LED supplier would not be in a position to undertake the whole scope of services, and therefore a maintenance provider would be the lead with a manufacturer(s) in its supply chain. As with the Supply and Installation approach, it is likely that the contractor will apply an additional percentage increase to the base price of the LED equipment, and there would be less transparency of cost with this scenario. This approach would place the responsibility for any defects solely with the contractor, as he would be responsible for the quality of the both product and the workmanship of the installation. The ongoing maintenance of the equipment would be the responsibility of the street lighting contractor.

Trial

The economic and social benefits of LED technology are already well understood, i.e. reducing energy use (and thereby reducing costs), reducing the fear of crime and improving road safety, and LED lighting has been used in Plymouth in isolated areas of the city for the past four years. The Authority is undertaking a LED street lighting trial during the months of January and February to gauge the public's perception of the new lighting over a wider area. The response from the trial will help to guide the wider roll out of the technology by addressing specific concerns, informing the future specification of the technology and assisting with specific siting issues should the project be approved.

6.2 Boiler Replacement Programme

The major procurement drivers for this project are generation of saving (economies of scale), therefore an approach that aggregates demand for financial benefits whilst including social obligations is recommended.

All options can either be carried out in collaboration with other authorities (e.g. Cornwall PV Framework) or independently by PCC.

Option One - Equipment supply only

Under this option most of the supply risk is borne by the authority, however it removes the potential for installation contractors to add overhead to the equipment cost. PCC would have to source a separate installation contractor and manage conflicts between installation and equipment manufacturers in case of equipment breakdown or stock loss (if equipment is free issued). This may also affect product warranty, as well as require additional contract management - therefore this option is not recommended.

Option Two - Equipment supply and install - recommended option - using the Hard FM framework currently being tendered by PCC

Equipment prices may increase slightly in this approach as suppliers have the opportunity to add a margin, however the contract value can also exert negative pressure on installation costs. It also means that the problems with equipment free issue are addressed and that product warranty is not affected. This appears to be the predominant market model, providing PCC with limited risks, less contract management requirements at a good value for money and is therefore recommended. By front loading the maintenance framework with a large capital value, installation and maintenance costs over the framework duration may also be reduced thus benefitting the Council in general. The Hard FM maintenance framework has been advertised in the Official Journal of the European Union with a value of £ 10 Million over a four year period to include a capital element. The framework also includes social obligations addressing the localism agenda.

Option 3 - Energy Performance Contracting

This option has been discounted as the scheme does not provide the financial return pre-requisites required by the commercial sector to make EPC work. I

6.3 Solar PV Installation Program

Key drivers for this project are savings in energy consumption (spend) and carbon. To maximise the benefits of the project the following procurement approaches have been considered, all of which can either be carried out in collaboration with other authorities (e.g. Cornwall PV Framework) to leverage economies of scale or independently by PCC. There is also a potential to collaborate across other city institutions e.g. Tamar Science Park, University.

Option 1 - Equipment supply only

This option allows for PCC to benefit from the changes in the PV market. A previous procurement revealed 40% difference in equipment and installation costs due to technological advances. The PV market - although established - is not mature and the recent developments point to a further period of pricing instability. However this option means that equipment would be stored and free issued to an installation company with all the risk (e.g. pilferage/ breakages etc.) associated with a free issue scenario. PCC would also have to source a separate installation contractor and manage conflicts between installation and equipment manufacturers in case of equipment breakdown. This may also affect product warranty, as well as require additional contract management. The predominant market model - from our experience - is a supply and installation model, therefore this option is not recommended.

Option 2 - Equipment supply and install - recommended option

Equipment prices may increase in this approach, however previous procurements have shown that due to the competitive nature of the market the overall value for money achievable is still good. It also means that the problems with equipment free issue are addressed and that product warranty is not affected. This appears to be the predominant market model, providing PCC with limited risks, less contract management requirements at a good value for money and is therefore recommended. The equipment supply and install contract could be advertised as a single large procurement (to leverage economies of scale), however containing local employment and other social obligations to address the localism agenda. It is not recommended to make use of a specific framework due to the price diversity in the market experienced in the most recent PV procurement; however this does not mean that the authority would not consider collaboration and pooling of demand with other councils/ organisations across the city.

Option 3 - Energy Performance Contracting (Lease)

Leasing whether operational (including maintenance) or financial is an option offered by a number of private companies. This option has on previous projects been discounted because, should PCC wish to redevelop any of the properties with leased PV equipment then the liability would not only be for the lease costs up to redevelopment but also for future profits and Feed In Tariffs, payable to the leasing company. Previous investigation of suitable break clauses by our property legal team and a previous procurement for a concession (based on roof leases) all revealed unacceptable risks. In addition under lease PCC would only benefit from the utility saving not the Feed in Tariff.

Conclusion

Whilst supply only is likely to provide the most economical route to procuring the street lighting equipment it is not without its risks. In the case of the boiler replacement and PV procurement, supply and install is the predominant market model and likely to provide the most economical route to market. However, a final determination should therefore be made following market engagement which will help to verify assumptions and evaluate current supply routes, prices and arrangements on offer prior to engaging in a formal tender process.

7. Assumptions

This report is based on the following main assumptions:

1. Table shows savings based over the measure's life
2. Loan duration has been adjusted to the measure's life
3. Resource requirements for project management and procurement have been factored into the capital costs
4. No savings in year 1 (installation year) of a measure are included
5. No loan repayment in year 1 (installation year) of any measure are included as loan repayments are due one year in arrears
6. Savings in energy are based on an annual energy price inflation of 5%
7. RPI is expected to rise by 3% p.a. (Feed in Tariff and Renewable Heat Incentive is increased in line with RPI)
8. Street lighting maintenance cost inflation is expected to be 5% p.a.
9. 20 year life expectancy of LED lights
10. 20 year life expectancy for solar PVs (with micro inverters)
11. No PV maintenance cost
12. CRC cost is not assumed to be increasing
13. Energy usage is assumed to be static
14. Demand base 2011/12
15. Electricity cost in 2011/12 – 10p/kWh (increased by 5% in every subsequent year)
16. Gas cost in 2011/12 – 4.5p kWh (increased by 5% in every subsequent year)
17. LED prices are expected to decrease over time (technological innovation) cancelling out any installation / equipment inflation
18. LED forecasts have been based on three broad categories of lights and will require full technical assessment prior to procurement, the project will then again be revised in view of technical specification

Annex I- Proposed locations for Solar PV installations

1. Central Library
2. Plympton Library
3. Central Museum
4. East End Business Park
5. Weston Mill Crematorium
6. Pounds House
7. Derriford Business Park
8. Harewood House
9. Efford Crematorium
10. Computer Complex (City Business park building)
11. Chelson Meadow MRF
12. Prince Rock Depot
13. Windsor House
14. Western Approach Car Park

Annex 2 - Proposed locations for Boiler Replacements

1. Elliott Terrace,
2. City Business Park,
3. Harewood House
4. Lanyon Almshouses
5. Pounds House
6. Prince Rock Depot Office
7. Windsor House,
8. Crownhill library
9. ACE Ford Centre
10. Efford YC
11. Frederick St YC
12. Honicknowle YC
13. Morley/Annexe YC
14. Rees YC
15. Southway YC
16. Tothill CC