

Eden District Council

Council
17 July 2014

Renewable Energy Feasibility Study and Business Case

Report of the Communities Director

Responsible Portfolio: Environment

1 Purpose of Report

- 1.1 The report sets out feasibility studies that have been carried out and a business case for taking forward a number of renewable energy projects.

2 Recommendation:

- 1) The Business Case containing proposed projects in Appendices A and B are approved.
- 2) The identified renewable energy projects at Penrith Leisure Centre, Appleby Leisure Centre and any relocated depot site if appropriate, be approved for implementation subject to negotiations with the relevant contractor and occupier and necessary planning permissions.
- 3) A supplementary capital estimate of £346,500 is approved in 2014-15 to fund the schemes set out at paragraph 6.2.2. This is to be funded by a revenue contribution to capital outlay which will require a supplementary revenue estimate of £346,500.
- 4) If the above recommendations are agreed then a post implementation review is undertaken within a year and reported to a meeting of the Environment Portfolio.

3 Report Details

Background

- 3.1 On the 27 March 2014, Council considered a report titled 'Delivering Corporate Projects and Priorities and Management of Succession'. As part of that report a number of priorities were agreed upon to be taken forward. Renewable Energy was highlighted as a key priority to be explored as Members were supportive of the environmental benefits and the potential for savings and income generation were of interest.
- 3.2 Since the Council decision to support the exploration in this area, a number of Council owned facilities and renewable energy technologies have been explored for their feasibility to be deployed in Council owned assets. Table A below, sets out the facilities that have been assessed and which technologies have been considered feasible to introduce.

3.3 It should be noted that both the Town Hall and Mansion House have not been assessed at present due to the Council’s aspirations to operate from a single site. When the Council has made clear plans for this project to go forwards a range of renewable energy options will be considered in more detail for the single site.

Table A - Facilities and Technologies Considered

Facility	Renewable Technology
Penrith Leisure Centre	Photovoltaic Panels Biomass Boiler
Appleby Leisure Centre	Photovoltaic Panels Biomass Boiler
Frenchfields Sports Pavilion	Photovoltaic Panels Biomass Boiler
Relocated Depot Site	Photovoltaic Panels Biomass Boiler

4 Penrith Leisure Centre Photovoltaic Panels Feasibility

- 4.1 Penrith Leisure Centre has been assessed for both the installation of Photovoltaic Panels (PV) and for the installation of a Biomass Boiler.
- 4.2 Penrith Leisure Centre has substantial roof spans covering the Sports Hall, Bowls Hall and the Swimming Pool. An initial assessment of the roofs has ruled out the Swimming Pool roof as being unsuitable for the installation of PV Panels due to its construction. The Sports Hall roof has for some time experienced a degree of water ingress and a decision has been taken to remedy the defects with the roof. It is proposed that after the repair has taken place that the roof is monitored for water ingress for a full year before any further activity takes place on the roof span. The roof has been structurally assessed for its ability to take the extra load of PV Panels and can accommodate them. A new calculation will be required once the repair work has been completed.
- 4.3 Waiting for a year after the repairs have been carried out enables the Council to consider whether it wishes to go ahead and expand on the PV installation at the Leisure Centre. After a year has elapsed, the Council will be in a position to understand how the PV Panels have performed on the Bowls Hall roof. The drawback to this approach is that there is a possibility that the Government Grants known as the Feed in Tariff may have reduced making a further scheme less economically viable.
- 4.4 The Bowls Hall roof has been assessed and it would be suitable for the installation of PV Panels, as part of the business case in Appendix A, this would involve the installation of upto a 50 kWp system with an estimated cost of £57,500. It is estimated that this investment would bring a return in the region of £124,000 over a twenty year period. Further detail and considerations associated with this installation can be found in Appendix A.

Penrith Leisure Centre Biomass Boiler Feasibility

- 4.5 A Biomass Boiler is a wood-fuelled boiler, also called a biomass system, it burns wood pellets, chips or logs to provide warmth in a single room or to power central heating and hot water boilers.
- 4.6 Biomass is considered a low-carbon option as the carbon dioxide emitted when wood is burned is the same amount that was absorbed over the months and years that the plant was growing. The process is sustainable as long as new plants continue to grow in place of those used for fuel. There are some carbon emissions caused by the cultivation, manufacture and transportation of the fuel, but as long as the fuel is sourced locally, these are much lower than the emissions from fossil fuels.
- 4.7 A site visit took place to look at the options and suitability of installing a biomass boiler to augment the existing Penrith Leisure Centre heating system. From the site visit, it would appear feasible to install a biomass boiler outside the building which would feed into the existing heating system.
- 4.8 Given the size of the heat load, it was felt that the most appropriate biomass boiler size would be 199kW - a size at the upper end of the highest Renewable Heat Incentive (RHI) tariff band. The Renewable Heat Incentive (RHI) is a long-term financial support programme for renewable heat. The RHI pays participants of the scheme that generate and use renewable energy to heat their buildings. By increasing the generation of heat from renewable energy sources (instead of fossil fuels), the RHI helps the UK reduce greenhouse gas emissions and meet targets for reducing the effects of climate change.
- 4.9 A 199kW Biomass Boiler System would have an estimated cost of around £100,000. It is estimated that this investment would bring a return in the region of £444,000 over a twenty year period. Further detail and considerations associated with this installation can be found in Appendix B.

Appleby Leisure Centre Photovoltaic Panels Feasibility

- 4.10 Appleby Leisure Centre was considered for its appropriateness for the installation of PV panels on its roof. Due to large trees close by to the facility it was considered not suitable for PV panels due to the shading effect the trees would have. The shading effect the trees would have would mean any system installed would be substantially hampered in its ability to produce electricity.

Appleby Leisure Centre Biomass Boiler Feasibility

- 4.11 A site visit took place to look at the options and suitability of installing a biomass boiler to augment the existing Appleby Leisure Centre heating system. From the site visit, it would appear feasible to install a biomass boiler outside the building which would feed into the existing heating system.
- 4.12 Given the size of the heat load, it was felt that the most appropriate biomass boiler size would be 199kW - a size at the upper end of the highest Renewable Heat Incentive (RHI) tariff band.
- 4.13 A 199kW Biomass Boiler System would have an estimated cost of around £100,000. It is estimated that this investment would bring a return in the

region of £444,000 over a twenty year period. Further detail and considerations associated with this installation can be found in Appendix B.

Frenchfields Sports Pavilion Photovoltaic Panels Feasibility

- 4.14 Frenchfields Sports Pavilion was considered for its appropriateness for the installation of PV panels on its roof. A limited system could be installed on the facility but there are a number of significant implications that make the installation problematic.
- 4.15 When the building was designed, it was envisaged that there may be a future possibility of developing both wings of the first floor into further office accommodation and as such 'future proof' its ongoing use should the need/demand arise. Installing the PV panels would hamper any future conversion or would mean removing the panels completely.
- 4.16 Due to its location, the roof is often exposed to footballs being accidentally kicked onto the roof and in the past a number of tiles have been damaged due to this occurring. Although PV panels are made to withstand considerable force, there is a possibility of the system being damaged and not operating successfully.
- 4.17 For the reasons set out above it is not considered appropriate to place PV panels on the roof of Frenchfields Sports Pavilion.

Frenchfields Sports Centre Biomass Boiler Feasibility

- 4.18 Frenchfields Sports Pavilion was considered for its appropriateness for the installation of a Biomass Boiler. Due to the fairly limited heating demand of the building it was not considered appropriate to install a Biomass Boiler due to the expensive nature of the upfront capital costs.

Relocated Depot Site Photovoltaic Panels Feasibility

- 4.19 The Council is currently in the process of acquiring a facility to relocate Amey and to improve its storage needs. The site has been considered and it would be suitable for the installation of PV panels, as part of the business case in Appendix A, this would involve the installation of upto a 50 kWp system with an estimated cost of £57,500. It is estimated that this investment would bring a return in the region of £124,474 over a twenty year period. Further detail and considerations associated with this installation can be found in Appendix A. It should be noted that at the time of writing this report, the site is currently not owned by the Council and if the acquisition was not to go ahead no further work would be carried out on the facility.

Contingency Funding

- 4.20 A request for contingency funding has been made as part of this project as there are likely to be a number of other costs associated with the installations of the renewable energy technologies.
- 4.21 For the PV Panels, each site will require a Distribution Network Operator (DNO) permission to connect to the network. A price for this permission will not be known until it has been applied for but it could be upto £3,000 for each permission granted. In addition, both buildings concerned are relatively high and may require substantial scaffolding and safety measures to be in place to

mount the PV panels. The roof on the depot site will require a structural survey to ensure it can cope with the increased load from the PV array.

- 4.22 With regard to the Biomass boiler, there may be additional costs with cladding the housing of the boiler, the pipework, the flue and the fuel storage area so that it fits in appropriately with its surroundings. In addition, the way in which the new boiler interfaces with the existing system may require more funds than the initial feasibility study suggests.
- 4.23 The Council may require additional technical assistance to plan and deliver the schemes set out in this report. There are a number of elements that require reasonably technical input such as developing the tenders for work, overseeing the necessary permissions that need to be in place and overseeing the installation of the schemes. It is expected that the additional assistance be funded from the contingency funding as it is a legitimate part of the capital project cost. It should be noted that much of the Corporate Project budget has already been assigned to gaining expert advice on setting up a separate company that will be concerned with housing.

Delivering the Schemes

- 4.24 Behind each of the proposed schemes is a considerable amount of work to be undertaken in planning for the installations, gaining necessary permissions, the tendering process and overseeing the work on site. A realistic target would be to have the PV installations in place by March 2015 and the Biomass boilers in place by September 2015 although every effort will be made to have the projects completed before these timescales.

5 Policy Framework

- 5.1 The Council has four corporate priorities which are:

Housing
Quality Environment
Economic Vitality
Quality Council

- 5.2 This report supports the Corporate Priorities of Quality Environment, Economic Vitality and Quality Council.

6 Implications

6.1 Legal

- 6.1.1 Two of the facilities are currently occupied by the Council's Leisure contractor, North Country Leisure. There are contained within the contract set responsibilities for the contractor to perform regarding energy usage and energy efficiency measures.
- 6.1.2 The proposals contained within this report will require negotiations and discussions in the context of the current Leisure Contract with North Country Leisure. Early discussions with the contractor have demonstrated a willingness for the schemes to become operational but greater consideration will need to be given as to how the contractor will benefit from the schemes and what additional duties they may be required to undertake in order for the systems (particularly the Biomass boilers) to work effectively.

6.2 Financial

6.2.1 Any decision to reduce or increase resources must be made within the context of the Council's stated priorities as set out in its refreshed Corporate Plan.

6.2.2 The provision of the photovoltaic panels and biomass boilers are proposed to be funded from revenue balances by revenue contribution to capital outlay as follows:

	£
Photovoltaic Panels	
Penrith Leisure Centre	57,500
Relocated Depot Site	57,500
Biomass Boilers	
Penrith Leisure Centre	100,000
Appleby Leisure Centre	100,000
Contingency 10%	31,500
Total Capital Spending	346,500

6.2.3 The council is relatively cash-rich with reserves, as at 1 April 2014, standing at £6.1m. It is considered that funding such a medium sized capital project from reserves would be appropriate. As the project is proposed to be funded from revenue, there is no effect on the Council's capital financing requirement meaning no minimum revenue provision is required.

6.2.4 There is no evidence of installation of such equipment increasing rateable value of properties. Significant revenue expenditure would be required in year 10 of £13,000 to the photovoltaic panels to replace the inverters: this is built in to the cash flow projections in Appendix A.

6.2.5 In summary the return on investment is as follows;

Scheme	Investment	Total income/saving over 20 years	Surplus income/saving (20 years) over investment	Annual return
	A	B	C= B-A	$(C/20)*100\%/A$
	£	£	£	
PV panels	115,000	366,000	251,000	10.9%
Biomass boilers	200,000	1,089,000	889,000	22.2%
Contingency	31,500	0	-31,500	
Total	346,500	1,455,000	1,108,500	16.0%

As a comparison, if the council were to put cash in to a 20 year government bond it would get a 3.29% return. Therefore, because of the government incentives, investment in the proposed renewal schemes provides a very good return.

6.2.6 There is a risk that whilst the project is developed and delivered that Central Government may alter the Feed in Tariff rates and or the Renewable Heat Incentive payment which may, depending on the amount altered, leave the project or parts of the project no longer viable. The projects are projected to give a high return: the Feed in Tariff rates and or the Renewable Heat Incentive payment would have to reduce substantially to make the schemes not viable. This is considered unlikely. It should also be noted that once power generation commences the tariff and payment are guaranteed at the rates at that point for 20 years.

6.3 Equality and Diversity

6.3.1 The Council has to have regard to the elimination of unlawful discrimination and harassment and the promotion of equality under the Equality Act 2010 and related statutes. There are no implications arising from this report.

6.3.2 There are no equality and diversity implications arising from this report.

6.4 Environmental

6.4.1 The Council has to have due regard to conserving bio-diversity under the Natural Environment and Rural Communities Act 2006.

6.4.2 Penrith Leisure Centre is situated on the edge of an Air Quality Management Area and consideration must be given to any likely emissions emanating from the Biomass boiler and an increase in vehicle movements in the area. A number of mitigating actions can be made to reduce the emissions depending on the type of boiler, flue and feed stock. Vehicle movements can be reduced by using wood pellets and having a reasonable sized pellet store. However, biomass boilers are considered more polluting than gas-fired boilers, which mean the issue will have to be addressed through the use of appropriate modelling prior to the submission of any planning application. In general it will not be acceptable in planning terms to install combustion plant that leads to an increase in pollutant concentrations where the background concentration already exceeds the air quality objective (as in an Air Quality Management Area).

6.4.3 In addition, a chimney height calculation may also be required from the air quality consultants for submission with the planning application and noise is another issue and cost which will need to be assessed and addressed prior to a planning application being made.

6.4.4 The project is in alignment with the Council's Environmental Policy which seeks to reduce carbon emissions in Council activities. Over the twenty year Feed in Tariff eligible period it is expected that the PV arrays will reduce carbon emissions by around 1,000 tonnes.

6.5 Crime and Disorder

6.5.1 Under the Crime and Disorder Act 1998 the Council has to have regard to the need to reduce crime and disorder in exercising any of its functions.

6.5.2 There are no crime and disorder implications arising from this report.

6.6 Children

6.6.1 Under the Children Act 2004 the Council has to have regard to the need to safeguard and promote the welfare of children in the exercise of any of its functions.

6.6.2 There are no child protection implications arising from this report.

6.7 Risk Management

6.7.1 Risk Management is a process whereby attempts are made to identify, actively control and reduce risk to protect the council. This covers not only the traditional areas of insurable risk but also the organisational risk that the council faces in undertaking all its activities.

6.7.2 There are a number of risks associated with this project in both developing the schemes and their operation. At an early stage the way in which the Biomass boilers interacted with the current heating systems would have to be examined to ensure they were compatible and complementary to one another.

6.7.3 Although Planning Permission is not required for the boiler, it may be required for the boiler house, fuel silo and flue. As part of the Planning Permission it is likely that the emissions will also be queried. The Biomass boiler element of this project would obviously not be allowed to go ahead if Planning Permission was refused. In addition, both Biomass boiler schemes would require a building warrant.

6.7.4 Paragraph 6.2.7 notes the risk around changes to the Feed in Tariff rates and/ or the Renewable Heat Incentive payment. The conclusion is that this is not a major risk to the viability of either PV panel project or the biomass project.

6.7.5 A local company has been commissioned to undertake the feasibility studies for each site that this report has considered. The company were chosen as they have staff that are highly knowledgeable in the field of renewables and also provide guidance on a national level about the use of renewables. Taking this approach has ensured that the estimated prices can be used as a fairly accurate picture of the final costs of the scheme and reduces the risk that when the schemes go out to tender that prices will come in far higher than anticipated.

7 Reasons for decision/recommendation

7.1 To seek agreement for the business case and release of capital monies to progress the schemes.

Ruth Atkinson
Communities Director

Governance Checks:

Checked by or on behalf of the Chief Finance Officer	✓
Checked by or on behalf of the Monitoring Officer	✓

Background Papers:

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Appendix A: Business Case

Penrith Leisure Centre Photovoltaic Panels and the Relocated Depot Site Photovoltaic Panels

Upto 50 kWp System on Bowls Hall Roof and the Relocated Depot Site

The table below sets out the economic case for investing in PV Panels for the Penrith Leisure Centre and the relocated depot site. Both sites have been assessed and the same PV array was recommended, therefore each of the figures should be doubled.

Estimated Capital Cost	£57,500 (Excluding VAT)
Estimated return, year 1	£6,350
Estimated payback year	Year 8
Estimated return on Investment	£124,474

Within the graph and table below, there is a projection of the cash flow which assumes the capital investment would be repaid in the first years of the scheme, however, given the Council's need to generate increased levels of income in the short term, this repayment period could be spread over a much longer time period.

A number of assumptions have been made about the scheme and are set out below:

Income Assumptions

- Initial FIT Rate - £0.1213
- Export Price - £0.0477
- Daytime Electricity Price - £0.0700
- Assumed Own Usage - 90%
- Export for FIT export payments - 10%

NB The initial FIT rate is reviewed quarterly and may be reduced on 1 January; 1 April; 1 July and 1 October each year depending on the technology take up. Once signed up the FIT rate is linked to RPI for the 20 year term of the contract. There is therefore an inherent risk that the longer the project takes to be delivered that the chance of the Feed in Tariff going down will increase.

General Assumptions

- Rate of general inflation - 4%
- Rate of electricity inflation - 6%
- Rate of export price inflation - 4%
- Annual performance degradation - 0.7%

Running Costs

- Year 10 Inverter replacement cost - £6,200
- Export metering (Est £50 per year)
- Maintenance costs are expected to be very minimal, indeed, rather than programming maintenance it may be more use to attend to the system if there are dips in the system's performance.

Carbon Emissions

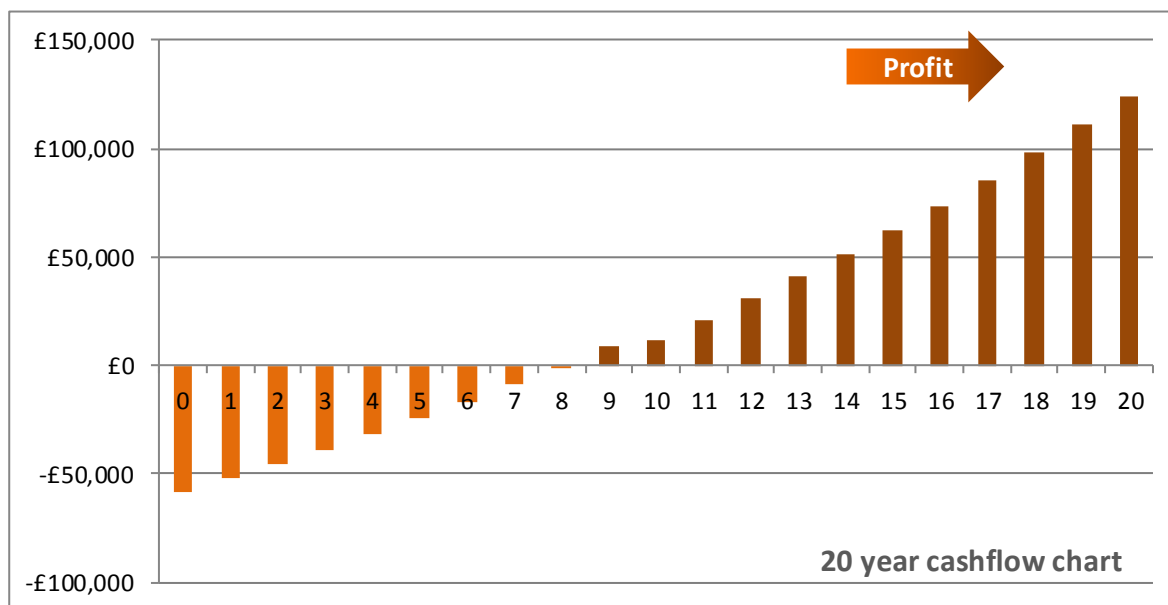
- The two systems will reduce carbon emissions by around fifty tons a year.

Life Expectancy of PV Panels

- Although the Feed in Tariff is only guaranteed for a period of 20 years, the life expectancy of Panels is generally given to be around forty years dependent upon the quality although warranties for the panels tend to be for twenty to twenty five years.

20 Year Cash Flow Chart and Table

Project IRR **12.18%**



Year	Estimated system generation (kWh)	Index linked income for the year			Expenditure	Cash flow
		FIT	Export	Electricity savings		
0					£58,650	-£58,650
1	33,930	£4,116	£162	£2,138	£50	-£52,285
2	33,692	£4,250	£167	£2,250	£52	-£45,669
3	33,457	£4,389	£173	£2,368	£54	-£38,793
4	33,222	£4,533	£178	£2,493	£56	-£31,645
5	32,990	£4,681	£184	£2,624	£58	-£24,214
6	32,759	£4,835	£190	£2,762	£61	-£16,489
7	32,530	£4,993	£196	£2,907	£63	-£8,456
8	32,302	£5,156	£203	£3,060	£66	-£103
9	32,076	£5,325	£209	£3,221	£68	£8,584
10	31,851	£5,499	£216	£3,390	£6,271	£11,418
11	31,628	£5,679	£223	£3,568	£74	£20,815
12	31,407	£5,865	£231	£3,756	£77	£30,589
13	31,187	£6,057	£238	£3,954	£80	£40,758
14	30,969	£6,255	£246	£4,161	£83	£51,337
15	30,752	£6,460	£254	£4,380	£87	£62,344
16	30,537	£6,671	£262	£4,611	£90	£73,798
17	30,323	£6,889	£271	£4,853	£94	£85,717
18	30,111	£7,115	£280	£5,108	£97	£98,122
19	29,900	£7,347	£289	£5,377	£101	£111,034
20	29,691	£7,588	£298	£5,659	£105	£124,474

See overleaf for assumptions

NB The capital cost in the table is higher than that quoted in the body of the report as it includes the cost of a structural survey and EPC survey. Both of these have already been undertaken as part of investigating if the scheme was feasible.

Typical commercial solar PV project considerations

A commercial solar PV project typically has four key elements to consider before it can proceed.

1. Distribution Network Operator (DNO) permission to connect to the network

Systems that will feed more than 16 amps per phase into the National Grid require authorisation from the DNO before they can be connected. This requires a formal application to be made to the DNO. There is no charge from the DNO for the application for connection. The cost for accepting a grid connection offer varies from DNO to DNO and from individual site to site. If the local network can stand the connection without any upgrades, either zero charge or an administration charge may apply to gain permission. If the local network requires upgrades then the cost for connection may run into thousands of pounds and render the project financially unviable. As the Penrith Leisure Centre and relocated depot site have a high power use, it is probable that the costs for connection of solar PV generation will not have a bearing on the viability of this project.

This connection approval process can take up to 45 working days for the DNO to complete.

2. Planning permission

In most cases, arrays of total capacity of 50kWp or under fall under permitted development if there is a border of at least a metre between any roof mounted array and the roof edge. If an array enters this 1m border, or is of total capacity of greater than 50kWp, planning permission is required. Under this proposal it may be useful to seek planning permission for an additional system to be installed on the Sports Hall roof as the planning permission would last for five years. This will give time to ensure the repairs done to the Sports Hall roof are effective and allow time to consider the performance of the array on the Bowls Hall roof and whether it is useful to consider expanding on the scheme.

3. Energy Performance Certificate

In order to receive the full Feed in Tariff rate it is a requirement to have an Energy Performance Certificate band D or better for a 'building' fed by the MPAN that the solar system feeds. If no 'building' connected to the MPAN that the solar system feeds can be assessed for the purposes of an EPC then an exemption is possible, so that the full Feed-in Tariff can be accessed.

The Penrith Leisure Centre has been assessed as falling in the band D category. The relocated depot site has been assessed as falling within the band C category.

4. Structural capability of the roof to take the loads imposed by a solar PV array.

It is essential that the opinion of a structural engineer is sought to confirm that the roof structure is suitable to take the additional load of a PV system. A structural engineer has assessed both the Bowls Hall roof and the Sports Hall roof and confirmed they are capable of taking the additional weight of a PV system.

The relocated depot site has yet to be assessed for its structural integrity to have a PV array mounted on its roof.

Appendix B

Appleby and Penrith Leisure Centre Biomass Boilers

The table below sets out the economic case for investing in Biomass Boilers for the Penrith and Appleby Leisure Centres.

The table below sets out the cost and returns for a single Biomass Boiler. Both sites have been assessed and the same Biomass Boiler size was recommended, therefore each of the figures should be doubled.

Estimated Capital Cost	£100,000
Estimated return, year 1	£ £20,242
Estimated payback year	5
Estimated return on Investment	£ 444,407

Below is the system data for the particular size of Biomass Boiler considered feasible for both sites. It should be noted that wood pellets are currently more expensive than gas so the difference in pricing has been built into the return on investment calculations.

Boiler size	199	kW
Annual heat load of building for space heating and hot water	261486	kWh
Proportion of heat load to be supplied by Biomass boiler	100%	
Wood fuel - annual cost (assumes 100% by biomass and pellet cost of £210/tonne)	£13,536	
Existing annual fuel bill	£10,767	
Residual fuel cost for old system (assuming 100% by biomass)	£0	
Estimated fuel cost saving from switching to biomass boiler	-£2,769	
Biomass boiler - estimated running hours (full load equivalent)	1314	
Estimated annual Tier1 RHI income	£23,011	
Estimated annual Tier2 RHI income	£0	
Fuel savings + RHI income - Additional servicing costs (if applicable)	£20,242	
Estimated payback time [(system cost)/(fuel savings + RHI income)]	4.94	
Total estimated RHI income over 20 years (assumes 2.7% rate of inflation)	£599,781	
Total estimated RHI and fuel savings over 20 years (assumes 2.7% rate of inflation)	£544,407	
Total profit after 20 years	£444,407	

Within the graph and table below, there is a projection of the cash flow which assumes the capital investment would be repaid in the first years of the scheme, however, given the Council's need to generate increased levels of income in the short term, this repayment period could be spread over a much longer time period.

In summary, there are obvious financial benefits to be made, but there are also some risks that should be considered and mitigated against.

Risks and Mitigating Activity

Issue/Risk	Impact L-M-H	Proposed actions
Air Quality is adversely affected by the installation of the Biomass Boiler <ul style="list-style-type: none"> • Cost implication 	H	Modelling will be undertaken on the likely emissions at an early opportunity to clarify what the likely emissions will be.
Connection and integration into existing system <ul style="list-style-type: none"> • Cost implication 	M	Consult existing heating system engineers to determine design and evaluate cost
Uncertainty over boiler house and silo design/cladding <ul style="list-style-type: none"> • Planning/visual implications • Cost implications 	L	Client to specify requirements in tender
Uncertainty over flue length and cowl type <ul style="list-style-type: none"> • Planning/visual implications • Minor cost implications 	L	Confirm exact biomass location and boiler type, then consult flue manufacturer
Objection by residents to perceived risk of smoke/noise	L	Provide examples of other installations

Maintenance Regime and Costs

Biomass boilers require more attention than a single annual maintenance visit that would be needed for conventional boilers. Weekly inspection are required to carry out a visual inspection of the boiler and fuel feed system, to check the lubrication of bearings and to empty the ash bin. It is assumed there will be an annual cost for a full service which will not be dissimilar to that of the existing gas boiler. For the weekly inspections, it is proposed that the current leisure contractors are trained to be able to perform this task. At present, the leisure contractors are responsible for the maintenance and servicing requirements of plant at the leisure facilities. As part of the negotiations with NCL due to this additional activity it may be necessary to remunerate them for this task at each site. It is considered that this undertaking would require staff time totalling a cost of no more than £1,000 for each site per year.