BRIDGEND COUNTY BOROUGH COUNCIL

REPORT TO CABINET

24 APRIL 2018

REPORT OF THE CORPORATE DIRECTOR COMMUNITIES

BRIDGEND TOWN HEAT NETWORK (CIVIC CENTRE) PROJECT

1. Purpose of Report.

1.1 The purpose of this report is to:-

- seek approval in principle of the financial case of the Outline Business Case (OBC) for the Bridgend Town Heat Network (Civic Centre) Project (Appendix 1),

- to recommend to Council the inclusion of £794,000 of borrowing in the Capital Programme, outlining the revenue implications of borrowing and confirming they will be covered by the scheme once all funding sources have been approved, and

- give permission for the Corporate Director – Communities to submit a grant funding bid to the HNIP capital fund in Autumn 2018 and subject to the approval of the Section 151 Officer accept the funding if successful.

2. Connection to Corporate Improvement Objectives/Other Corporate Priorities

2.2 The Bridgend Town Heat Network Project positively contributes to two of Bridgend County Borough Council's (BCBC) Corporate Priorities, namely:

- Supporting a successful economy
- Smarter use of resources

3. Background.

3.1 BCBC first began investigating heat network opportunities in 2012 and commissioned AECOM to undertake high level heat mapping and master planning activities for Bridgend. The report identified several opportunities within Bridgend Town one of which was centred upon the civic centre buildings. AECOM were commissioned to carry-out a detailed feasibility study of the various options within Bridgend Town in 2015.

3.2 During the development of the feasibility study for the Bridgend Town project, BCBC was selected as a demonstrator for the Smart System and Heat Programme (SSH) Programme in October 2014. Cabinet previously received a report (3rd February 2015) regarding the programme to authorise BCBC's participation in the programme. The SSH Programme is an ambitious, highly prestigious project, which will catapult BCBC into the role of one of the leading low carbon local authorities in the UK. The programme offers significant benefits and opportunities to BCBC such as:

- Enhanced profile;
- Income generation and financial savings potential;

- Significant investment creating job and training opportunities,
- Address fuel poverty and health inequalities among residents;
- Enhanced energy security and resilience to residents and businesses;
- Supply chain development opportunities for local businesses.
- Link to energy prospectus opportunities within the proposed Cardiff City Deal

3.3 The Bridgend Town Heat Network Project is one of the deployment projects within the SSH Programme.

4. Current situation / proposal.

4.1 The feasibility study undertaken by AECOM in 2014 was completed in June 2016 and recommended three options for a Phase 1 development of a heat network project within Bridgend Town. The options are shown in Table 1.

Table 1 Bridgend Town Heat Network Options

Option	Description
A – Two Hospitals	1.6MW_e Gas engine CHP and back-up boilers at Princess of Wales (PoW) hospital with the heat network supplying both the PoW and Glanrhyd.
B – Town Centre	0.4MW_e Gas engine CHP and back-up boilers at the Bridgend Life Centre with the heat network supplying the two recreation centre buildings and Civic Centre Offices (CCO), as well as the Sunnyside New Development. There would also be a private wire from the Life Centre to CCO.
C – PoW Hospital and Town Centre	1.6MW_e Gas CHP and back-up boilers at the PoW hospital with the heat network supplying both the PoW and the buildings in the town centre.

4.2 Each of the three options were assessed against the project's objectives and critical success factors. The town centre project (Option B) received the highest overall score. Although the town centre project scored slightly lower than the other options in terms of meeting the project objectives of reduced energy costs and reduced carbon emissions due to its smaller scale, it is however deliverable and contributes strongly to driving economic development whilst offering opportunities for expansion and will provide the first step in the process of decarbonising Bridgend Town.

4.3 An Operations Group was created to provide a governance structure and to drive the project forward chaired by the Corporate Director - Communities and attended by the Head of Finance and representatives from Welsh Government and Halo Leisure. The Operations Group meets on a monthly basis.

4.4 Following the completion of the feasibility study the next step was the creation of an Outline Business Case (OBC), which can be found at Appendix 1 to this report, for the project based upon the UK Treasury Five Case Model. Specialist advisors were procured for the development of the Commercial, Financial and Economic Cases and support was provided by Welsh Government via the Carbon Trust for the development of the Strategic and Management Cases.

4.5 The OBC was completed in December 2017 and is based upon a gas combined heat and power unit being installed within Bridgend Life Centre and serving that building as well as the Bridgend Bowls Hall, the Civic Offices and the new Sunnyside Development being built by Linc Cymru.

4.6 The project could be delivered through a Special Purpose Vehicle (SPV) created by BCBC. The SPV would operate as an Energy Service Company (ESCO) and this is presented within the OBC as the preferred option for the delivery of the scheme. The creation of the ESCO to deliver the project will be subject to a future Cabinet report where all options are considered and appropriate recommendations made to Cabinet. Given the limited in-house resource within BCBC or within a newly established ESCO to effectively manage a multi-contracts strategy and BCBC's preference for a higher level of risk transfer to the private sector, a turnkey Engineering, Procurement and Construction (EPC) contract, encompassing the Design, Build, Operation and Maintenance (DBOM) tasks is therefore proposed. This option offers full guarantee of efficiency in the implementation of the project with minimal intervention on the investor's side. From a risk perspective, bringing the O&M contractor into the single contract also provides additional benefit. The benefits of this approach are:

- Single point of contact means no interface for the ESCO to manage;
- Cost certainty is provided subject to standard exceptions;
- Time certainty with penalties for late delivery;
- Performance testing to ensure the energy centre and network will deliver to the specification; and
- Allowing operational performance and failures to be linked to contracts to protect the ESCO.

4.7 Cabinet will be asked for approval for the creation of the SPV as part of a future Cabinet report once the detailed costings, revenue funding and all the issues regarding the creation of a SPV such as tax and banking implications have been resolved. Cabinet will also be asked to approve the remaining four business cases of the OBC as part of a future Cabinet report.

4.8 Subject to successful Cabinet approvals the timeline for the project is proposed in Table 2:

Table 2 Bridgend Town Heat Network Project Timeline

Assurance/Approval Milestone	Completion / Planned Date
Final Outline Business Case	January 2018
Inclusion of project within the WG Targeted Regeneration Investment Programme	March 2018
Cabinet Report Decision to Proceed Based on the Financial cases of OBC	April 2018
Begin drafting of DBOM ITT	May 2018
Apply for HNIP grant funding	October 2018
Cabinet Report Creation of SPV Decision to Proceed on commercial and management cases of OBC	October 2018
Decision on HNIP Funding	March 2019
Set Up Special Purpose Vehicle	July 2019
Award DBOM Contract	July 2019
Preparation of Full Business Case	September 2019
Heat Network Operational	October 2020

5. Effect upon Policy Framework& Procedure Rules.

5.1 The award of the DBOM contract will be subject to an open procurement process and will adhere to the Council's Contract Procedure Rules.

6. Equality Impact Assessment

6.1 The BCBC Equalities Impact Assessment Toolkit has been utilised, which indicates that the scheme will have no impact on specific equality groups and disability duties through Phase 1 project development but will require further investigation through a future Phase 2 Delivery stage.

The project is a positive step in regard to the Council's role in complying with the Well-being of Future Generations (Wales) Act 2015.

7. Financial Implications.

7.1 The financial model built for the project based upon an AECOM report prepared by a cost consultant estimates the capital expenditure required to construct the initial phase of the Bridgend Town Heat Network project to be £1,959,000 (indexed linked).

7.2 In addition to the £1.959 million, the financial model, which is over the fifty years (the lifetime of the scheme), includes additional capital spend of £3,537,000. This is because the Combined Heat and Power engine only has a useful economic life of 15 years. It is anticipated that future revenue streams will be generated to cover the majority of this capital expenditure but there is an assumption that the Council would need to finance an amount of £57,000 in 2048-49. The first capital refresh is in 2033-34 and this would require £453,000 of capital from the revenues

generated and built up. There is a financial risk to the Council (albeit a low risk) if sufficient revenues aren't generated.

7.3 The capital outlay required to construct the Bridgend Town Heat Network Project has been modelled over the 50 years is £5.496 million as detailed in the below table and subsequent paragraphs:-

Table 3 Project Funding Sources

Funding Source	Secured £'000	Unsecured £'000	Year 1 Capital Outlay Total £'000	Unsecured Future Years Capital Outlay Total £'000	Capital Outlay Over 50 Years Total £'000
HNIP Grant Programme	-	665	665	-	665
BCBC Capital Programme	250		250	-	250
WG Targeted Regeneration Investment Programme		250	250	-	250
BCBC Borrowing/WG Loan	-	794	794	57	851
ESCO Cash Reserves				3,480	3,480
Total	**250**	**1,709**	**1,959**	**3,537**	**5,496**

7.4 The £665,000 Capital Grant Contribution will be sought through the UK Government HNIP Grant Programme. HNIP is a £320 million capital grant funding programme setup to develop heat networks across the UK which will form part of the UK decarbonisation process. The grant is a competitive fund open to all local authorities across England and Wales with the next bidding round opening in October 2018 with successful bidding authorities being notified in March 2019.

7.5 The £250,000 BCBC Capital was confirmed by Council as part of the approval of the Medium Term Financial Strategy 2016-17 to 2019-20 subject to "a clear direction being agreed on the funding mechanism for the whole scheme".

7.6 In order to make the Financial Model viable and to ensure it is compliant with State Aid rules, the assumption is that as well as the £250,000 confirmed by Council, there is an additional £250,000 which is intended to be met through the Welsh Government Targeted Regeneration Investment Programme (TRIP). If the allocation required from TRIP is unsuccessful then an additional contribution of £250,000 will be required from the BCBC Capital Programme. This will need to form part of a future bidding process for capital and will require Council approval. Unfortunately, the Model does not prove cost effective if the extra contribution was required to be met from additional borrowing as there would not be sufficient

revenue generated to cover the annual Prudential Borrowing costs. The project could not be developed under these circumstances.

7.7 The final element of the funding package is a borrowing component. The Model includes £794,000 borrowing in 2018-19 and an additional £57,000 in 2048-49. Borrowing has to be included within the project finance package in order to ensure state aid compliance. The SPV would be required to make the borrowing repayments from its revenue income that it receives from providing heat and electricity to customers. The Council is one of the main customers in Phase 1 of this scheme along with HALO and Linc Housing.

7.8 Talks are ongoing with Welsh Government regarding the provision of an interest free loan for the project from Welsh Government to cover the £794,000 borrowing for the initial phase. Regardless of the borrowing source, the annual borrowing costs need to be paid by the SPV. The decision to proceed with the borrowing element of the project would be subject to a further Council report seeking a separate approval for this element of the scheme and for this to be included within the Capital Programme.

7.9 The Financial Model shows that the project generates sufficient revenues to cover ongoing operational costs and service the borrowing debt. This is shown in Table 4 below. The table also shows that if the TRIP funding is not secured then it could also cover the borrowing costs of the extra £250,000 though this would be the worse case scenario

Table 4 Example Year of Operating Revenues and Costs

Income	**Assumption: All External Funding Confirmed £'000 (a)**	**Assumption: Only HNIP Funding Confirmed £'000 (b)**
Heat Revenue	109	109
Electricity Revenue	217	217
Total Income	**326**	**326**
Expenditure	**£'000**	**£'000**
Gas Charge	133	133
Maintenance & Fixed Costs	42	42
*SPV Running Costs	17	17
**Other ESCO Operating Costs	43	43
Total Expenditure	**235**	**235**
Net Income before Borrowing Costs	**91**	**91**
Annual Costs of Borrowing (£794,000 (a) and £1,044,000 (b))	41	50
***Surplus at Year end to build up the Capital Reserve**	**50**	**41**

* SPV Running Costs – the assumption is that only 50% of the SPV running costs are attributable to this scheme

** ESCO Operating Costs includes payment of Business Rates of £38,500 per annum. Discussions have been held with the Wales Co-Operative Centre around the type of structure that the SPV should be setup as, with the intial advice being that a Community Benefits Society model would be appropriate. If this option is followed business rates would not be payable and therefore the ESCO Operating Costs would reduce by £38,500 per annum.

*** The £50,000 listed as surplus is a non-indexed figure as Table 4 only shows a typical year (Year 3) of revenues and operating costs for the project.

7.10 The annual surplus will need to be used to build up a sufficient reserve to finance future capital expenditure as outlined in Table 3. It would also be needed to cover any extra running costs of the SPV over and above the £17,000.

7.11 The Bridgend Town Heat Network project carries financial risks which can be described as:

- If the project does not generate its anticipated revenues it will be unable to meet its borrowing commitments;
- Failure to secure grant funding from UK Government will prevent the project from proceeding to construction;
- The project requires that BCBC run a procurement exercise to appoint the DBOM contractor. This process will be run at risk at a cost of £60,000 to BCBC (total cost of procurement will be £120,000 of which a £60,000 contribution will be requested from Welsh Government) if the project does not secure the appropriate funding and any abortive costs can not be capitalised and would put a pressure on the Communities Revenue budget.

7.12 The management of exposure to financial risk is a key consideration of BCBC in the development and delivery of the project. As such the commitment of BCBC to the project is subject to:

- All the funding being secured from the various sources needed for delivery;
- The capital cost of the scheme not exceeding £2 million;
- Mutually acceptable contractual terms being agreed with the owners of the connected buildings;
- A suitable contractor being procured to deliver the scheme within the cost profile identified through the OBC.

8. Recommendations.

8.1 It is recommended that Cabinet:

(i) Approve in principle the financial case of the OBC for the delivery of the Bridgend Town Heat Network Project recognising that the approval of the delivery of the project is subject to:

a. A successful HNIP grant application;
b. A full business case that demonstrates the market can deliver the project for the costings contained within the OBC.

c. Approval from Council for any additional capital funding required in the event that the TRIP grant bid is not successful.
d. Comfirmation that borrowing costs and the full cost of the SPV will be covered from revenues generated from the scheme.

(ii) Recommend to Council the inclusion of £794,000 of prudential borrowing in the Capital Programme, either provided by Welsh Government or an application for such borrowing will be made by BCBC, outlining the revenue implications of borrowing and confirming they will be covered by the scheme and for the scheme to be included within the capital programme for delivery once all funding sources have been approved.

(iii) Give permission for the Corporate Director – Communities to submit a grant funding bid to the HNIP capital fund in Autumn 2018 and subject to the approval of the Section 151 Officer accept the funding if successful.

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April 2018

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Background Documents; None

Appendix 1

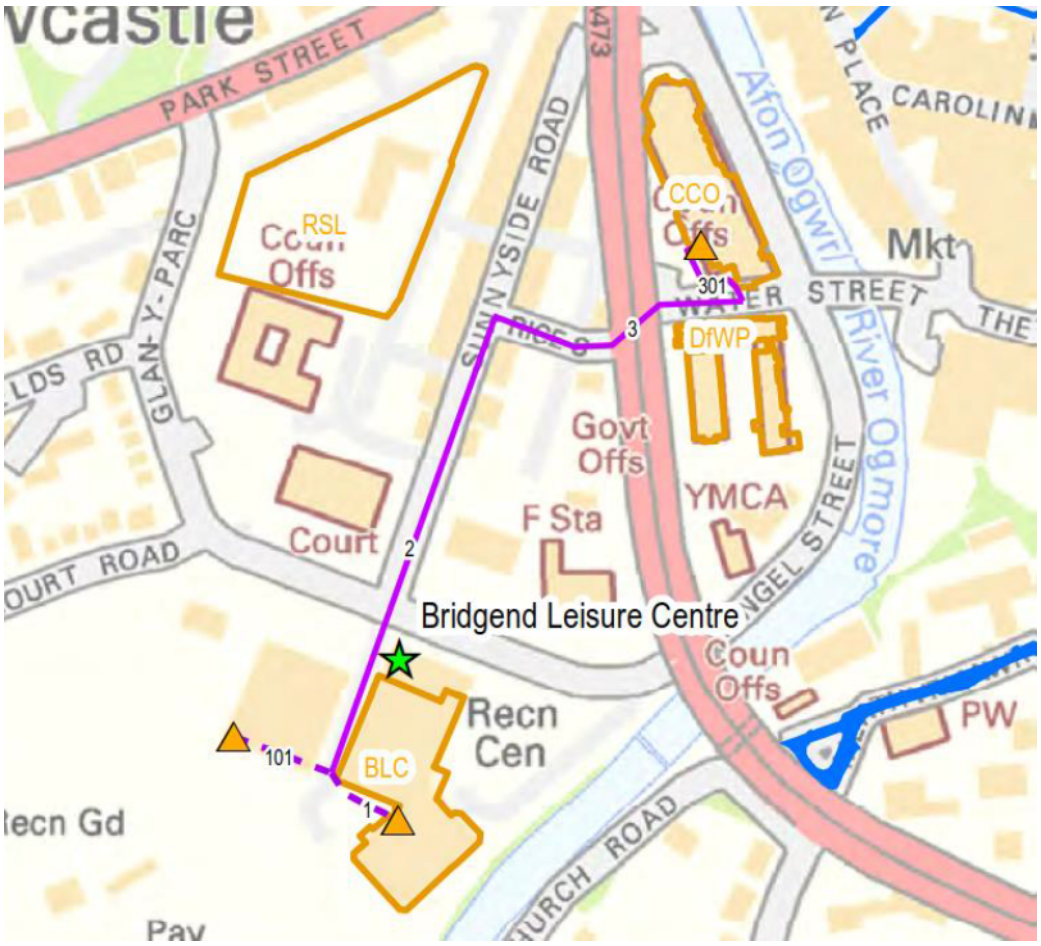
Bridgend Town Heat Network Business Case

Bridgend County Borough Council

Bridgend Town Heat Network

Business Case

Date:	Version:	Author:	Document Status:
4 Dec 2017	1.0	Michael Jenkins and Jonathan Williams	Draft



0.0 Document Control

0.1 Version Control

Version	Status	Date	Author	Amendment Details
1.0	Draft	4 Dec 2017	MJ/JW	First draft

1.0 Executive Summary

Approval sought

Approval is sought from BCBC Cabinet to proceed with the Bridgend Town Heat Network (see description below) subject to:

- A successful capital application to government for 35% of the capital costs of the network;
- Approval for borrowing of £1.3M made up of £500,000 from the Capital Programme (BCBC would not expect a return on this finance and £794,000 (40.5% of the capital costs) from Prudential Borrowing or a Welsh Government source which would require separate approval from full Council.

Subject to the above, delegated powers would also be granted to the Director of Communities to:

- Procure a suitably qualified contractor to Design, Build, Operate and Maintain (DBOM) the network;
- Agree with GLL/Halo the terms of a variation to the existing Leisure Contract to establish the network's energy centre at the Bridgend Life Centre; and
- Establish a Special Purpose Vehicle (SPV) company owned by BCBC.

Introduction

The proposed Bridgend Town Heat Network will initially be established to serve public sector buildings at the heart of the Town including Bridgend Life Centre, Bowls Hall, Civic Centre Offices and the new Sunnyside development. The network will be capable of future expansion to supply other buildings in the immediate vicinity of the network, as well as buildings to the east of the river in commercial heart of the Town Centre. The energy centre for the network will be based at the Bridgend Life Centre (BLC) and initially use gas fired combined heat and power (CHP) and back-up gas boilers.

Aims and Objectives

The council's aim is that a network will be developed which not only provides key benefits for the initial building connections but which continues to grow to extend these benefits across the public sector, businesses and, over time, the domestic sector.

As such BCBC's long term, strategic expansion objectives could be summarised as ensuring the network infrastructure that is established will:

- Continue to provide reduced energy costs for customers compared to individual building based boilers.

- Provide clear carbon emission savings compared to conventional alternatives and, over time, achieve decarbonisation of the heat supplies.

- Drive local economic development and build a local skills base.

In the future, it will also achieve social benefits through addressing fuel poverty and health improvements amongst local residents.

Options Assessed

As shown in the table below, initially three key heat network options were identified for consideration following a feasibility study conducted by a consulting engineering company. These were then assessed against the project's objectives and critical success factors. The Town Centre project received the highest overall score. This option is the most deliverable as it is not reliant on the willingness of the Health Board to commit its primary hospital in Bridgend as the main anchor load. Although the Town Centre Network scored slightly lower than the other options in terms of meeting the project objectives of reduced energy costs and reduced carbon emissions due to its smaller scale, it is deliverable and contributes strongly to driving economic development which offering opportunities for expansion.

Table S1 Short list of heat network options

Option	**Description**
A – Two Hospitals	1.6MW_e Gas engine CHP and back-up boilers at Princess of Wales (PoW) hospital with the heat network supplying both the PoW and Glanrhyd.
B – Town Centre	0.4MW_e Gas engine CHP and back-up boilers at the Bridgend Life Centre with the heat network supplying the two recreation centre buildings and Civic Centre Offices (CCO), as well as the Sunnyside New Development. There would also be a private wire from the Life Centre to CCO.
C – PoW Hospital and Town Centre	1.6MW_e Gas CHP and back-up boilers at the PoW hospital with the heat network supplying both the PoW and the buildings in the town centre.

Preferred option

Following the analysis performed during the Feasibility Study, the financial returns, the deliverability and the wider strategic benefits of creating a heat network, the Town Centre Network was identified as the Base Case Preferred Option. From the analysis against Business as Usual, it was clear that developing a heat network offered a greater financial benefit than continuing with a business as usual approach. Lifetime savings from the heat network project are estimated at £690k compared to business as usual. Furthermore, this option provides savings of 600 tonnes of CO2 per annum compared to continued use of individual, building based boilers.

Commercial Issues

A wholly private sector delivery model was discounted early in discussions given that Greenwich Leisure Limited/Halo (the current operators of the Bridgend Life Centre) indicated

that they did not want to be involved in delivering the project in its entirety and no other private sector parties have been identified who would be willing to sponsor and take forward this project. In addition, for wider strategic reasons outlined in the strategic case, the Council's preference was to have some level of direct participation in the project.

Taking into account the above factors and based on early discussions of both stakeholder and project objectives the three possible delivery structures outlined in the table below were identified.

Table S2 Short list of delivery body options

Option	**Description**
Option 1	Halo retain and upgrade energy centre assets at the Bridgend Life Centre becoming bulk heat supplier to a Council led network.
Option 2	Halo and Council enter into a joint venture for the project – the energy centre assets are transferred to the JV vehicle which also owns the heat network. The Council and Halo are customers of the network.
Option 3	Council take over and upgrade energy centre assets as part of a Council owned project. Halo is a customer of the network only.

The delivery options were discussed with all key stakeholders and within the Council both individually and at a stakeholder workshop for the project. Discussions took place in light of the project objectives, key constraints and wider potential low carbon energy strategy within the Council. The relative benefits of different options were considered. Following this process, the option of the Council taking over and upgrading the BLC energy centre (Option 3) assets as part of a Council owned project with the use of an Energy Services Company (ESCO) emerged as the preferred option and it is this option that forms the basis of the commercial case.

A separate delivery vehicle is rarely a requirement except in very specific cases. It is generally a matter of choice taking into account funding, project risk, management and governance considerations. In this case, the wider strategic objectives of the Council as set out in the strategic case are of particular relevance. The strategic case sets out the Council's ambitions for future energy and low carbon initiatives to deliver Council and Welsh Government objectives and requirements such as the Well-being of Future Generations (Wales) Act 2015, the improvement of well-being and alleviation of fuel poverty. **Establishing an ESCO will enable project benefits to be retained in the ESCO vehicle for furthering these wider strategic objectives.**

The Council considered a range of contracting options but it is recognised that there is limited in-house resource within the Council or within a newly established ESCO to effectively manage a multi-contracts strategy and the Council's preference is to achieve a higher level of risk transfer to the private sector contractors. **A turnkey EPC contract, encompassing the design, build, operation and maintenance (DBOM) tasks, is therefore proposed.** From a risk perspective, bringing the O&M contractor into the single contract would also provide additional benefit. Metering and billing could be contracted for separately or retained in-house given the number of customers. The benefits and risks of this approach:

- Single point of contact means no interface for the ESCO to manage;
- Cost certainty is provided subject to standard exceptions;
- Time certainty with penalties for late delivery;
- Performance testing to ensure the energy centre and network will deliver to the specification; and
- Allowing operational performance and failures to be linked to contracts to protect the ESCO.

Financial Issues

The capital cost of the network is estimated at £1.959m. It is intended that the project be funded from a mixture of:

- BCBC Capital Programme: £500k
- Capital grant: £665k
- Prudential Borrowing: £794k

The table below shows the results of the Base Case financial model for the proposed funding route. The outputs of the Base Case model show that the project is viable as it can repay its loans by the end of the 50 year project timeline. The Project shows a low but positive Project IRR of 2.71%. As a result of the cash demands of the business, dividends to BCBC are not available until the Project end, after capital funding requirements and debt obligations have been met. This is reflected in the Investor IRR which is slightly higher (at 5.24%) than the loan rate (4.65%), which represents the return generated via the dividend.

Table S3 Base Case financial modelling results

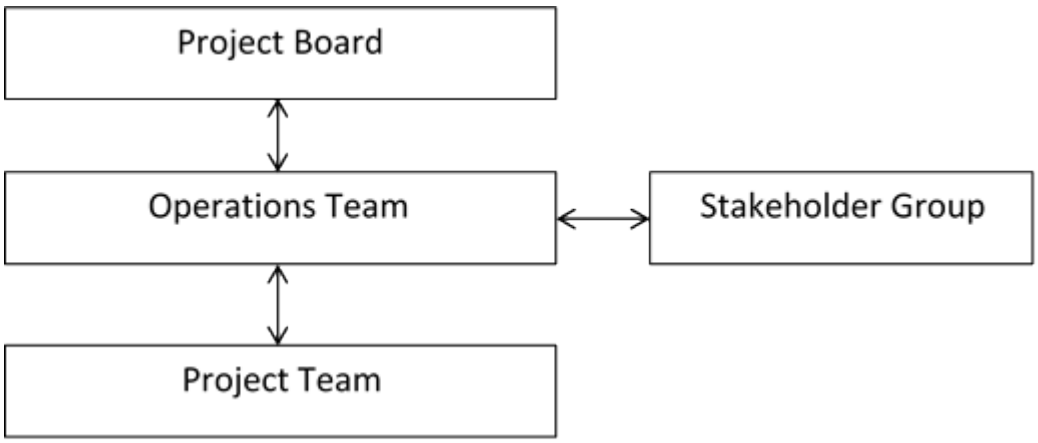
Returns				Funding Structure of Initial Drawdown			Results		
Project IRR	Investor IRR	Investor NPV £'s	Investor Payback Period	Loan at State Aid compliant rate	HNIP Grant £'s	BCBC Capital Injection	Dividends £'s	Cash at Project End	Project Viable
2.71%	5.24%	(109,810)	21	793,764	664,930	500,000	(961,958)	0	Yes

Management Issues

The development of the OBC, including all supporting technical, financial and commercial advice, has been overseen by the Bridgend Town Heat Network Operations Team. This was formulated in 2017 and has met on a regular basis. The planned Governance arrangements for the commercialisation phase of the network are shown in the figure below and build on those adopted for the development of the project OBC.

The implementation of the Bridgend Town Heat Network will be overseen by a Project Board which will provide the strategic leadership for the project. Beneath this, during the implementation phase, the key responsibility of the Operations Team will be to agree the details of the contract variation required for the BCBC and GLL/Halo Leisure contract. These bodies will be supported by a Project Team, led by a dedicated project manager. Wider stakeholders will be invited to join a Stakeholder group. It is envisaged that these arrangements will evolve further once the SPV is established and the single DBOM contract achieves financial closure.

Figure S1 Governance arrangements



Prior to the award of a DBOM contract a procurement exercise needs to be completed that will require specialist technical, legal and financial support. The cost for providing this support is estimated at £120,000. It is anticipated that a funding bid will be made to the UK Government Heat Networks Delivery Unit to secure part funding (67%) for this piece of work. The remaining 33% match will be provided by BCBC.

The project requires that a SPV is created to deliver the project. Specialist legal support will be required to do this. The cost of this has been estimated as £35,000. Attempts will be made to secure support for this again from the HNDU support funding with the remainder of the funding being provided by BCBC.

Key Milestones

The table below sets out the steps required for implementation of the project, together with the associated timeline. The timelines for implementation of the project are to a large extent influenced by the timing of the capital grant funding round, although significant preparatory work is proposed in advance of an application.

Table S4 Timetable for assurance and approval milestone

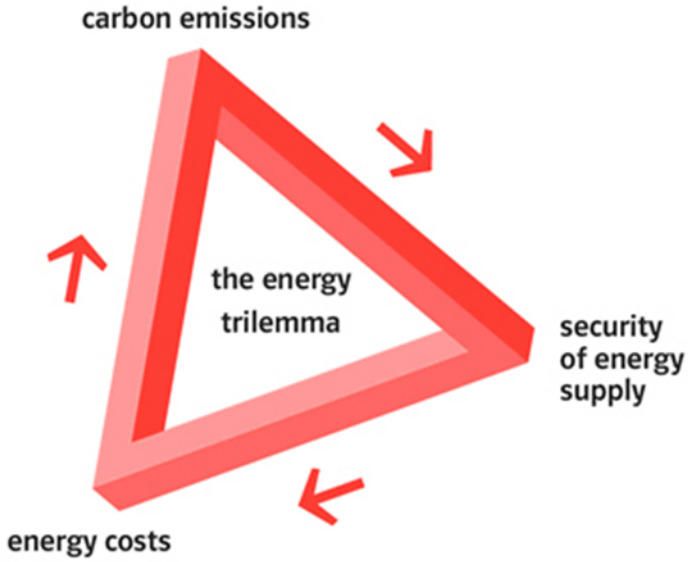
Assurance/Approval Milestone (e.g.)	**Completion / Planned Date**
Final Outline Business Case	December 2017
Cabinet Report issued with OBC attached	December 2017
Cabinet Further Investment Decision to Proceed	January 2018
Apply for Capital Grant Funding	October 2018
Set Up Special Purpose Vehicle	September 2018
Apply for HNIP grant funding	November 2018
Award DBMO Contract	May 2019

2.0 Strategic Case

2.1 Purpose

The Problem
Heat accounts for over 40% of the UK energy demand contributing nearly 20% of the UK's total carbon emissions. Action needs to be taken within the heat sector if the UK is to meet its 80% carbon reduction target by 2050. The lowering of CO^2 emissions can be achieved but it requires long term significant investment at a time when the need to address fuel poverty and provide secure energy supplies is especially prevalent. The problems of lowering carbon emissions, addressing fuel poverty and providing secure energy supplies are often termed as the energy trilemma (See Figure 1).

Figure 1 Energy Trilemma



Dealing with the energy trilemma means building a low carbon economy that will reduce carbon emissions, be technology agnostic so that opportunities to exploit new and/or local sources of heat are possible and that consumers are offered a genuine competitively priced energy supply.

Heat networks offer a potential solution to solving the energy trilemma. In this regard they are able to:

- provide access to local sources of heat;
- decarbonise large numbers of buildings; and
- offer opportunities for local control of the schemes which allow pricing to be controlled.

BCBC began investigating heat network opportunities across the County Borough in 2012. The conclusion of this scoping work was that Bridgend Town offered several opportunities for the development of a heat network and through further analysis it was considered that a scheme based around the Civic Centre within Bridgend Town offered a good opportunity to develop a heat network within Bridgend.

How will the Project Benefit BCBC?

Meeting Corporate Plan Objectives

The primary driver behind the project is to address the problem of the energy trilemma. However, BCBC screens projects against the criteria of how they meet its objectives within the Corporate Plan.

The Bridgend Civic Centre Heat Network Project meets two of the three corporate objectives namely:

Smarter Use of Resources:
One the key objectives set out in the BCBC Corporate Plan is to make smarter use of resources. It is essential that the Council's services continually deliver value for money and that this underpins everything that the Council does. As stewards of public money the Council are determined to get the most out of our resources and that means continually striving to improve efficiency and productivity in all the Council's activities.

The development of the Bridgend Town Centre Heat Network will reduce the cost of energy for the connected buildings. As the Council owns the buildings being initially connected, this will mean the services provided within these buildings can be provided at lower cost. In the leisure buildings this will mean the users will continue to have access to the same activities they currently enjoy but the cost to the Council of providing users with access to these facilities will reduce. Likewise, in offices users will continue to have access to a comfortable working environment but the costs of providing this working accommodation will fall.

Furthermore, the future of energy supplies is uncertain with fossil fuels becoming increasingly expensive amid concerns about their long term availability and their damaging environmental impact. Development of the network will reduce the exposure of connected buildings to energy price volatility and facilitate reduced reliance on fossil fuels in the future.

The scheme forms a first phase of wider development plans which will significantly contribute to BCBC meeting its future carbon budgets which could have financial penalties attached to them for failure to manage emissions in line with the allocated budget for the area.

Supporting a Successful Economy:
In 2014 BCBC was successfully selected to be one of the demonstration areas for the Smart System and Heat Programme. The SSH Programme has the potential to make Bridgend an innovation centre for the low carbon economy. The "low carbon economy" is loosely defined as all the economic activities that deliver goods and services which generate significantly lower emissions of GHGs (predominantly CO2). It is constantly evolving as new activities are conceived or brought to market. Each of these activities involve a number of companies, each employing a number of people that work to produce a quantity of goods and services that are consumed both domestically and internationally.

The low carbon economy generated £70.8bn in turnover in 2013 for those businesses operating directly in the sector. This figure grows to £121.7bn when the supply chain is included. The Low Carbon Economy is comprised of several elements which can be categorised as:

1. Low Carbon Electricity
2. Low Carbon Heat
3. Energy from Waste and Biomass
4. Energy Efficiency Products
5. Low Carbon Services
6. Low Emission Vehicles

The Bridgend Town Centre Heat Network scheme is one of several projects that BCBC is developing with an aim to develop the area as a centre of the low carbon economy within South Wales and where skills can be developed by an SME base that are able to exploit economic opportunities across the region as well as the wider UK market.

Meeting Statutory Requirements
The heat network project will help BCBC to demonstrate compliance with a range of different pieces of legislation.

Wellbeing of Well-being of Future Generations (Wales) Act 2015: The Act puts in place seven well-being goals. Development of the Bridgend Town Heat Network will contribute to these goals, including helping to achieve: a resilient Wales; a globally responsible Wales; and a prosperous Wales. Table 1 sets out how this project relates to all seven well-being goals.

Table 1 Meeting the Wellbeing Goals

Wellbeing Goal	**How Operation Meets the Goal**
A Prosperous Wales	The project will form part of the wider Smart System and Heat Programme within Bridgend which will create new market opportunities generating new employment and a skilled work force to meet these opportunities.
A Resilient Wales	The heat network being developed around the Bridgend civic centre is the foundation of wider plans to expand into other parts of the town. As the network develops low carbon sources of heating will be sourced such as heat pumps etc. which will enhance the energy security of the area.
A Healthier Wales	The ultimate aim of the scheme is to expand beyond the initial civic centre area and connect housing onto the scheme and BCBC is in discussion with the local health board to realise the benefits to the health agenda of better management of energy within domestic properties to the physical, mental and respiratory health of individuals.
A More Equal Wales	Part of the wider aims of the project are to establish Bridgend as an area of low carbon innovation where private sector investment will create employment and training opportunities for residents that would previously be unavailable.
A Wales of Cohesive Communities	The heat network project can be both a catalyst and a contributor to regeneration within Bridgend Town. The project will drive low carbon technology and with the smart elements of the SSH Programme integrated there is potential to provide Bridgend with greater connectivity.
A Wales of Vibrant Culture and Thriving Welsh Language	Wales was once at the centre of the global energy system and through the new market opportunities created within low carbon innovation Wales can reclaim its cultural identity through the energy field.
A Globally Responsible Wales	The project is part of the wider plans to de-carbonise the UK energy system which will contribute to the global challenge to control climate change.

BCBC has signed the Welsh Government's Sustainable Development Charter and has committed to making sustainable development the central organising principle in how it makes decisions and carry-out its work.

Carbon Budgets:
Climate change is one of the greatest threats of the 21st Century. Globally, 14 of the 15 hottest years on record have occurred since 2000. The impacts of climate change are already being felt in the UK. Changes to the UK climate are likely to include periods of too much or too little water, increasing average and extreme temperatures, and sea level rise. The Committee on Climate Change (CCC) concludes that the most urgent risks for the UK resulting from these changes include:

- Flooding and coastal change risks to communities, businesses and infrastructure.
- Risks to health, wellbeing and productivity from high temperatures
- Risk of shortages in the public water supply, and water for agriculture, energy generation and industry, with impacts on freshwater ecology.

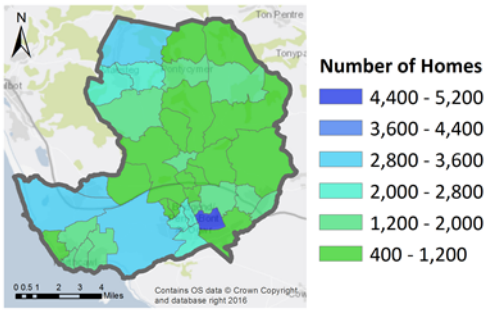
As part of international efforts to mitigate climate change a range of policy initiatives have been introduced at a UK wide, national and local level.

The UK Parliament approved the Climate Change Act in 2008. This makes it a duty of the Secretary of State to ensure that the net UK carbon account for all six Kyoto greenhouse gases for the year 2050 is at least 80% lower than the 1990 baseline. Carbon budgets have been set to reflect the Climate Change Committee's estimate of the most 'cost-effective' path to the 2050 target. Their cost-effective path is designed to represent the lowest cost way of meeting the 2050 target, taking into account the full range of criteria set out in the Climate Change Act (including impacts on energy security, competitiveness, fuel poverty and the fiscal balance).

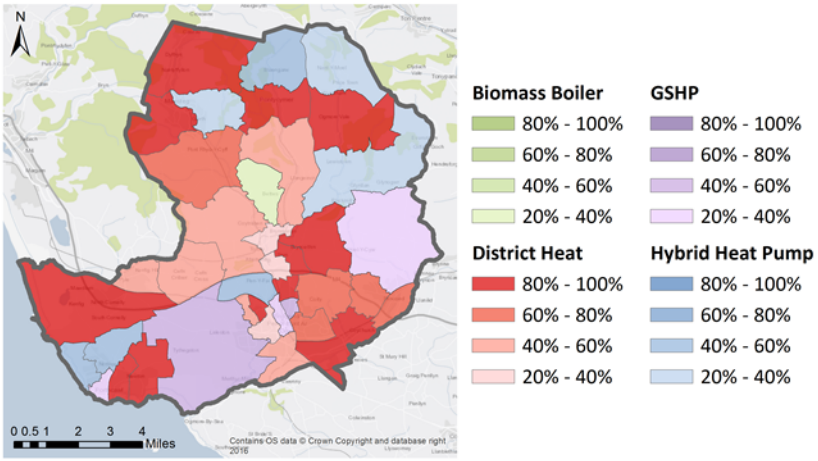
In Wales, the Welsh Government has committed to introducing a carbon budgeting framework for Wales. The legislative vehicle for this, the Environment (Wales) Act, received Royal Assent in March 2016 and requires that before the end of 2018 the Welsh Government under Part 2 of the Act must set in regulation interim emissions targets to 2040, as well as carbon budgets to 2025. The Bridgend Town Centre Heat Network is aligned with the Environment Act for decarbonisation and will contribute to carbon budgeting targets and the approach being taken will conform to the goals and principles of the Well-being of Future Generations (Wales) Act 2015.

BCBC in conjunction with Energy Systems Catapult (ESC) as part of the Smart System and Heat Programme is establishing a decarbonisation pathway for Bridgend out to 2050. Through the use of the EnergyPath Networks tool BCBC is developing a Low Carbon Transition Strategy which will set out a pathway to the decarbonisation of Bridgend County Borough through the use of heat networks, ground and air source heat pumps and biomass boilers.

Figure 2 Decarbonised Bridgend in 2050



Transition Two



The Bridgend Civic Centre Heat Network represents one of the important initial steps within the plan which will enable BCBC to meet its statutory obligations under the Environment (Wales) Act. Figure 2 shows that the decarbonisation plan for Bridgend Town is heavily focused upon the deployment of heat networks within the area.

What is the Counter-factual?

If BCBC is to meet its carbon reduction obligations under the Wales Environment Act but does not actively pursue the de-carbonisation plan it is developing with the ESC under the SSH Programme then it would need to maintain the current system of individual boilers within buildings.

The current system whilst being able to deliver heat to building users does, in no way, meet the wider objectives of the heat network project. Heat networks are traditionally developed along purely commercial lines, in that the project is evaluated around its ability to provide a positive return on an investment. The Bridgend Civic Centre project is being developed as a tool to deliver environmental, social and economic benefits that the counter factual option will be unable to address.

The individual boiler option will not be able to address the problem of how we de-carbonise Bridgend Town. The heat network will enable a low carbon technology (e.g. heat pump) to be deployed as the energy source for the scheme which will enable large numbers of buildings to be de-carbonised quickly and which will ultimately cost less than de-carbonising individual buildings.

The heat network will also enable local sources of heat that currently exist or may exist in the future to be accessed and exploited in a way that the counter factual option cannot do.

The heat network aligns more closely with the aims of the Well-being of Future Generations (Wales) Act 2015 than the counter factual since BCBC is considering the future needs of the area in terms of decarbonising and meeting social and economic improvement goals.

2.2 Aims and outcomes

2.2.1 Background

Current situation

The current situation is built on the precept that individual buildings within Bridgend Town are predominantly heated with fossil fuel fired boilers. This is a highly carbon intensive approach and provides maximum exposure to fossil fuel price volatility. The higher density of buildings in the civic centre area of Bridgend presents an opportunity for a heat network to be built comprised of pre-insulated hot water pipes and a centralised gas CHP energy centre.

Benefits of a Heat Network

There are clear benefits to the development of the Bridgend Civic Centre heat network scheme. The benefits can be articulated under the following broad headlines:

Financial Savings/Income Generation:

A heat network scheme within Bridgend offers an opportunity to generate financial savings and potentially generate an income stream in future years as the scheme expands.

The savings will increase annually as grid based energy prices increase and buildings connected to the scheme no longer have to maintain and replace individual boiler plant. There is an opportunity to generate revenue from the heat sales as the network expands to properties not in the ownership of BCBC.

Currently the scheme is modelled that non-BCBC customers of the heat will receive a 5% reduction on their current bill and customers of the electricity (BCBC and Halo) will receive a 10% reduction on their bill.

Decarbonisation of Bridgend:

The Welsh Government introduced the Environment Act in 2016 with the aim of Part 2 of the Act being to reduce greenhouse gas emissions by at least 80% by 2050. Reducing emissions and transitioning to a low carbon society and economy is vital for our future generations as it will improve the social, economic and environmental well-being of Wales.

The Bridgend Town Heat Network Scheme will be the cornerstone of decarbonising the heat sector of the town out to 2050. The connection of buildings and houses to a central energy plant will enable large numbers of properties to decarbonise very quickly as the transition is made away from natural gas heat solutions.

The Civic Centre based scheme is the first phase in the development of a town wide heat network which aligns with the SSH Programme EnergyPath tool which considers that a heat network is the optimum technology for the decarbonisation of heat within Bridgend Town.

Part 2 of the Wales Environment Act is likely to place duties on local authorities to manage local carbon budgets which may have financial penalties for failure to stay within the budget. Therefore being able to manage carbon emissions proactively (which the heat network enables us to do) will be a considerable asset in the future.

Well-being of Future Generations (Wales) Act 2015:

The creation of a heat network scheme within Bridgend Town is a long term project designed to have real environmental, social and economic benefits for the area. The project aligns perfectly with the Well-being of Future Generations (Wales) Act 2015 requirements since the project is about making decisions that will yield long term benefits rather than taking the short term option (individual boilers) which costs less but does not achieve any of the environmental, social or economic benefits that the heat network project does.

Addressing Fuel Poverty:

The most recently published official fuel poverty statistics for the UK indicate that in 2011, 29% of households (0.27 million) in Wales were spending more than 10% of their income on fuel use to heat their home to an adequate standard of warmth. This proportion is significantly greater than the UK average of 17%. Recent figures on the exact number of households in fuel poverty are unavailable; however estimates based on modelling assumptions suggest in the region of half a million, roughly 41% of households in Wales fell into this category in 2013.

With the impacts of welfare reform compounded by rising energy prices, fuel poverty is likely to continue to rise on the agenda both in Wales and the UK as a whole.

Successfully tackling fuel poverty not only has social, health and wellbeing benefits but also economic in terms of householder savings and employment opportunities, and environmental benefits linked to carbon emissions reductions. Addressing fuel poverty requires an examination of the multiple factors which drive it, including:

- energy efficiency of the home;
- poor energy efficiency behaviour;
- energy costs; and
- household income.

Although providing financial assistance to those in, or at risk of, fuel poverty may help provide a quick fix the unstable nature of fuel prices and incomes provides further reason to support innovative solutions which allow direct intervention upon energy supply and pricing which currently is beyond the scope of BCBC to influence. In the longer term, the Bridgend Town Heat Network project has the ability to stabilise energy prices for customers and as part of the wider SSH Programme deliver real changes for residents with the creation of business models designed to specifically address fuel poverty and although there will be limited numbers of residential connections in Phase 1 this will grow as a key benefit as the scheme expands in the residential areas of Bridgend Town.

Health Improvements from Fuel Poverty Alleviation:

There are a variety of health risks associated with living in fuel poverty and can broadly be summarised as:

General Health: A range of health impacts have been demonstrated to be associated with inadequate heating, e.g. gastric ulcers, colds, sore throats, frequent headaches and eczema.

Cardiovascular Health: The research identifies an association between coronary events and cold weather; those living in cold homes also have an increased risk of high blood pressure.

Respiratory Health: Studies show a 30-50% increase in a variety of respiratory illnesses and an increase in hospitalisations due to respiratory illness for people living in damp/and/or cold homes.

Physical Health: The symptoms of physical diseases such as arthritis are known to be worsened for sufferers who live in cold, damp homes.

Mental Health: For those individuals suffering from mental health illness research shows that symptoms are worsened when living in cold, damp, dark properties.

Research carried out by the Administrative Data Research Centre for the Welsh Government Warm Homes Nest scheme has shown the impact that energy efficiency measures have had upon the health and hospital admissions of recipients of the measures.

The research looked at two groups with the first group having received energy efficient measures and the second group having received no measures. Groups were representative of different demographic groups e.g. less than 5 years old, over 75 years old etc. The research found that:

1. A 3.9% decrease was recorded for visits to a GP for a respiratory event for the group that received the energy efficiency works as opposed to a 9.8% increase in the group that did not receive any works.
2. A 6.5% decrease was recorded for asthma events for the group that received energy efficiency measures compared to a 12.5% increase in the group that did not receive any measures.
3. The data showed a positive impact upon hospital admission rates for those people that had received measures although the impact was not considered to be statistically significant.

Additional Service Benefit

BCBC has lodged an expression of interest for the WG Local Fibre Networks Programme. It is our intention to develop a private fibre network within Bridgend Town at the same time as the heat network is developed to reduce infrastructure costs. The fibre network would serve a number of purposes such as providing free WiFi in the town centre but also acting as an enabler to the work that Hitachi are currently doing around the creation of a smart master plan for Bridgend.

Relationship with Strategic Objectives

Feasibility work has identified the potential for a heat network supplying public sector buildings to the west of the River Ogmore close to Bridgend Town Centre. The study considered various combinations of options with the recommended start-up scheme set out in the scope section of this business case. The most economical start-up network involves several BCBC owned buildings and a new development located on the site of the former Bridgend Magistrates Court and BCBC Sunnyside Offices. The new development is comprised of a primary health care/wellbeing centre and 60 flats. The project is being delivered by Linc Cymru Housing Association Ltd. Linc Cymru Housing Association Ltd is a Registered Society under the Co-operative and Community Benefit Societies Act 2014 and a Registered Social Landlord regulated by the Welsh Government.

The buildings can act as the long term anchor loads required to financially underpin the construction and subsequent operation of the network. The network will be sized with the ability for significant numbers of private sector buildings to connect to the scheme with the intention being to offer low cost, secure heat supplies with reduced environmental impact.

2.2.2 Scope

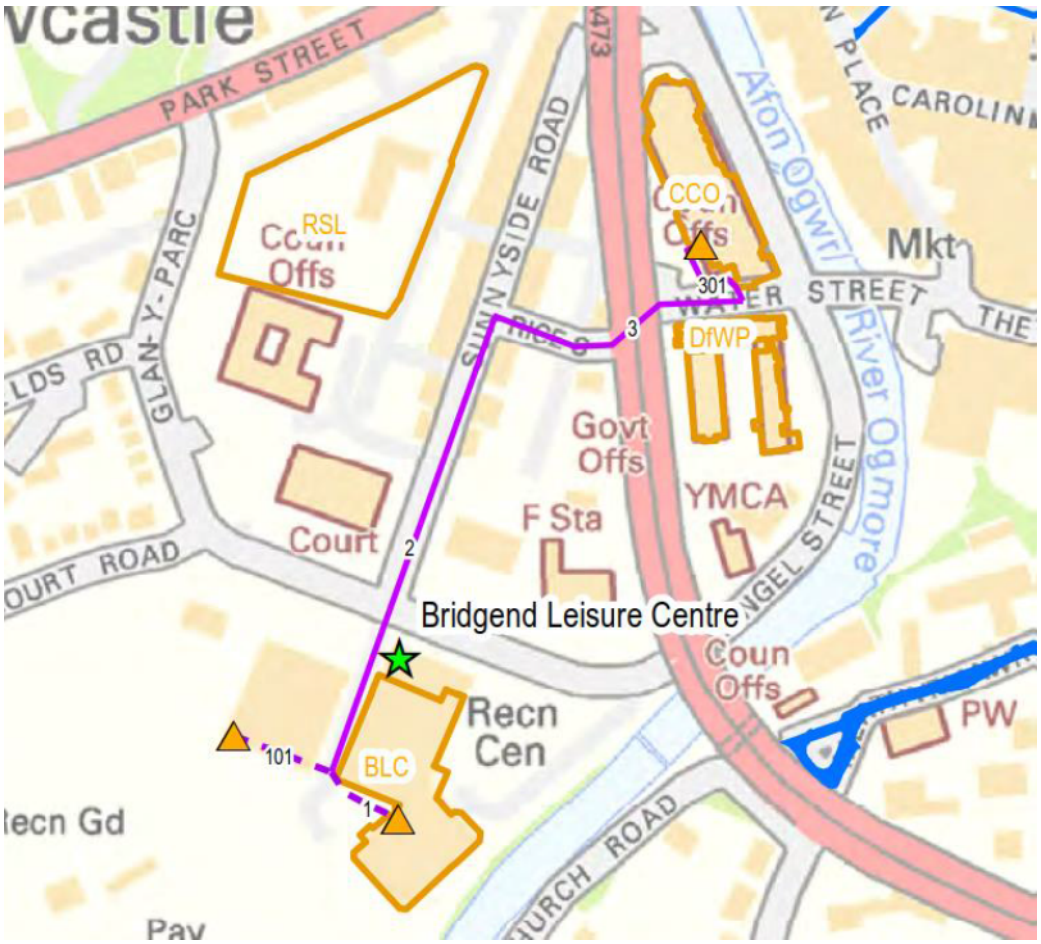
BCBC has a number of key drivers for the project relating to decarbonisation, the minimisation of costs of heating for public and privately owned buildings within the civic centre, enhanced resilience and achievement of social benefits. Within the town centre it is intended that these aspirations are in part achieved through the development of a heat network. The sub-sections below provide further details of the envisaged geographic spread of the network, together with providing details of the buildings to be connected and partners involved in the project.

Geographic Scope

BCBC has aspirations for heat networks to be constructed in several parts of the borough with potential for interlinking certain networks over time. This start-up heat network represents the Council's first step into implementation within the heat network market. It is a deliverable network which addresses a number of the Council's corporate drivers, while also being compatible with their long term vision for providing secure, affordable and low carbon heat for Bridgend.

To begin with the start-up network will serve public sector buildings in a civic cluster close to the town centre and the new Sunnyside development, which is a mixed use development comprised of housing and a health care facility. The initial network will be bound by the River Ogmore to the east and south, Park Street to the north and Glan-y-Parc to the west (see Figure 3).

Figure 3 Bridgend Civic Centre Heat Network



The connection of the public sector, anchor heat loads within this core area will provide the long term assurance to enable construction of the network, which will in time expand to supply other buildings.

Buildings Connected

The most economical network identified in the initial geographic area supplied the Bridgend Civic Centre Offices, the Bridgend Life Centre, the Bowls Centre and Sunnyside Development (located on the map where the BCBC Sunnyside Offices and Bridgend Magistrates Court were formally located) with gas fired combined heat and power (CHP) and top-up boilers.

The start-up network will, therefore, be established based on the following core of public sector buildings:

- Civic Centre Offices;
- The Indoor Bowls Centre;
- Bridgend Life Centre;
- Sunnyside Development (primary care facility and 60 flats).

Although the start-up network would only supply these buildings, the network would be capable of supplying other buildings in the area e.g. the Department for Work and Pensions (DWP) and Raven's Court, as well as expansion to supply buildings further afield.

The network would be supplied from an energy centre at the Bridgend Life Centre (which has an existing gas fired CHP unit).

The sub-sections below summarise the current arrangements for heating in the buildings that it is proposed should connect, when the heating plant is installed and what would happen in the absence of a heat network being installed. The information in these sections has been derived from the AECOM May 2014 Final Report on the Business Case for Town Centre

District Heating Network and the AECOM March 2017 Opportunities identification and Economic Viability Assessment.

Council Civic Offices

Bridgend Civic Centre Offices are the main headquarters building for Bridgend County Borough Council. The building was built in 1985 and is spread over 4 floors. The building underwent a partial refurbishment in 2017 to repair the roof, replace the windows and install photovoltaic panels.

The building is mixed-mode ventilated. The heat for space heating is provided via two gas fired 218kW Strebel E300 10 boilers that were installed during 2007/8. These feed radiator circuits and constant temperature low temperature hot water (LTHW) heating coils for air handling units. DHW is supplied via a solar hot water heater, with a 94kW heat output, and hot water cylinder. The current plant room of the Civic Centre Offices is towards the southern end of the building on the 5th floor. There is a vertical service duct by the lift shaft which runs from the basement car park up to the 5th floor that could be used as a route for heat mains.

Indoor Bowls Centre

The Indoor Bowls Centre facilities are used by Ogwr Indoor Bowls Club during the winter months. The Centre is heated via the radiators and LTHW heating coils temper fresh air in the air handling unit. The heat for the space heating and mechanical ventilation is provided via six gas boilers (see adjacent photo) which are in need of replacement. The six (Stelred) Ideal boilers were installed in 1993 and each have a nominal output of 97kW, giving a combined installed capacity of 582kW. Domestic Hot Water (DHW) is also provided from these gas boilers, via a calorifier. The existing boiler room is located on the ground floor with direct access from outside.

In the absence of the building connecting to a heat network, the existing boilers would need to be replaced to ensure the security of the heat supply to the building.

Bridgend Life Centre

The Bridgend Life Centre consists of a remodelled Sports Hall building and Leisure Pool Building. The Sports Hall building has been sub-divided to provide a reduced size hall, library, climbing wall and a play area, with a new main entrance on the ground floor. The space heating and DHW for the Leisure Pool Building and Sports Hall Building are provided from a boiler plant room located in the Leisure Pool Building (see adjacent photo). The Life Centre benefits from an onsite combined heat and power (CHP) plant (see adjacent photo). This was installed in 2012, having previously been installed at a separate location.

Operation of the indoor Bowls Centre and Life Centre

Halo is a registered charity and social enterprise running 20 sport and leisure facilities in Wales and England on behalf of local authorities. Being a social enterprise means Halo trades for social purposes. They are a not for profit organisation with no shareholders. The money Halo make is reinvested back into the facilities, allowing costs to be kept low and value for money to be achieved. Halo, sub-contracted by Greenwich Leisure Limited, operate several

leisure facilities in Bridgend, including the Bridgend Life Centre and Bowls Hall. It will be necessary to agree mutually acceptable terms between BCBC and Halo to allow both buildings to be connected and the Life Centre to become the heat supplier for the heat network.

Bridgend Life Centre

The new Sunnyside development conceptual masterplan is for a 700m² multi-use health and social care centre with at least 60 residential units on the 1.9ha development site on Sunnyside Road. It is envisaged that the development's uses will be served by a site heat network, allowing connection into the wider district heating network.

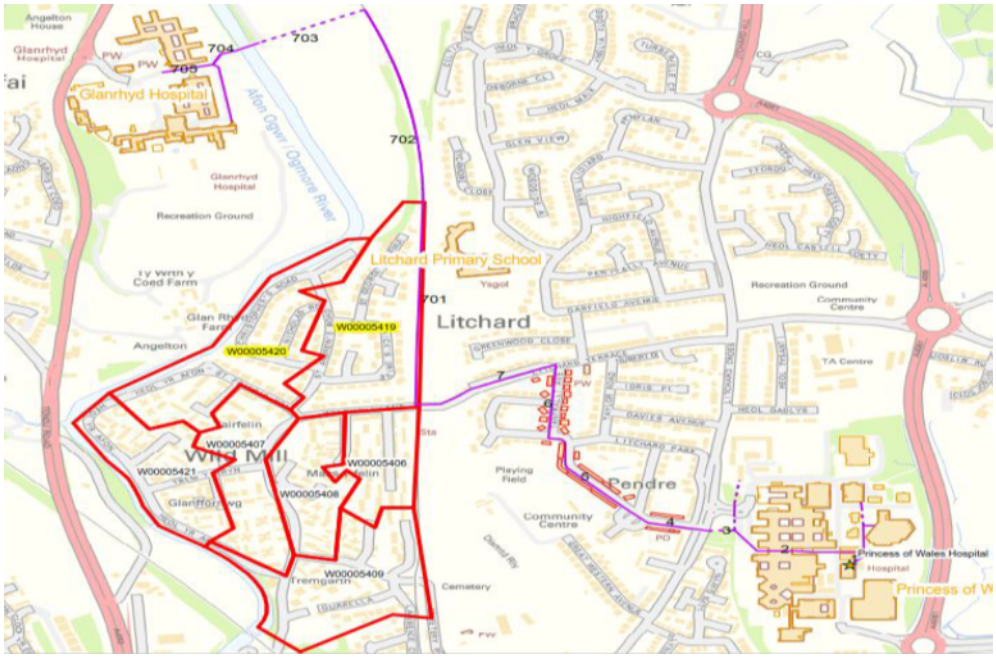
Future Scope

The ambition for the heat network scheme is that it expands beyond its original core Civic Centre buildings in line with the Low Carbon Transition Strategy developed within the SSH Programme and becomes the key tool to assist in the de-carbonisation of Bridgend Town. It is envisaged that the network will expand through several phases over a short, medium and long term timescale. The future plans for expansion are considered to be:

Phase 2 Hospital/Housing Connections

As Phase 1 of the Bridgend Heat Network scheme is being developed based around the Civic Centre area of the town a second scheme is being investigated centred upon the Princess of Wales Hospital, Glanrhyd Hospital and the Wildmill Estate. The scheme is shown in Figure 4.

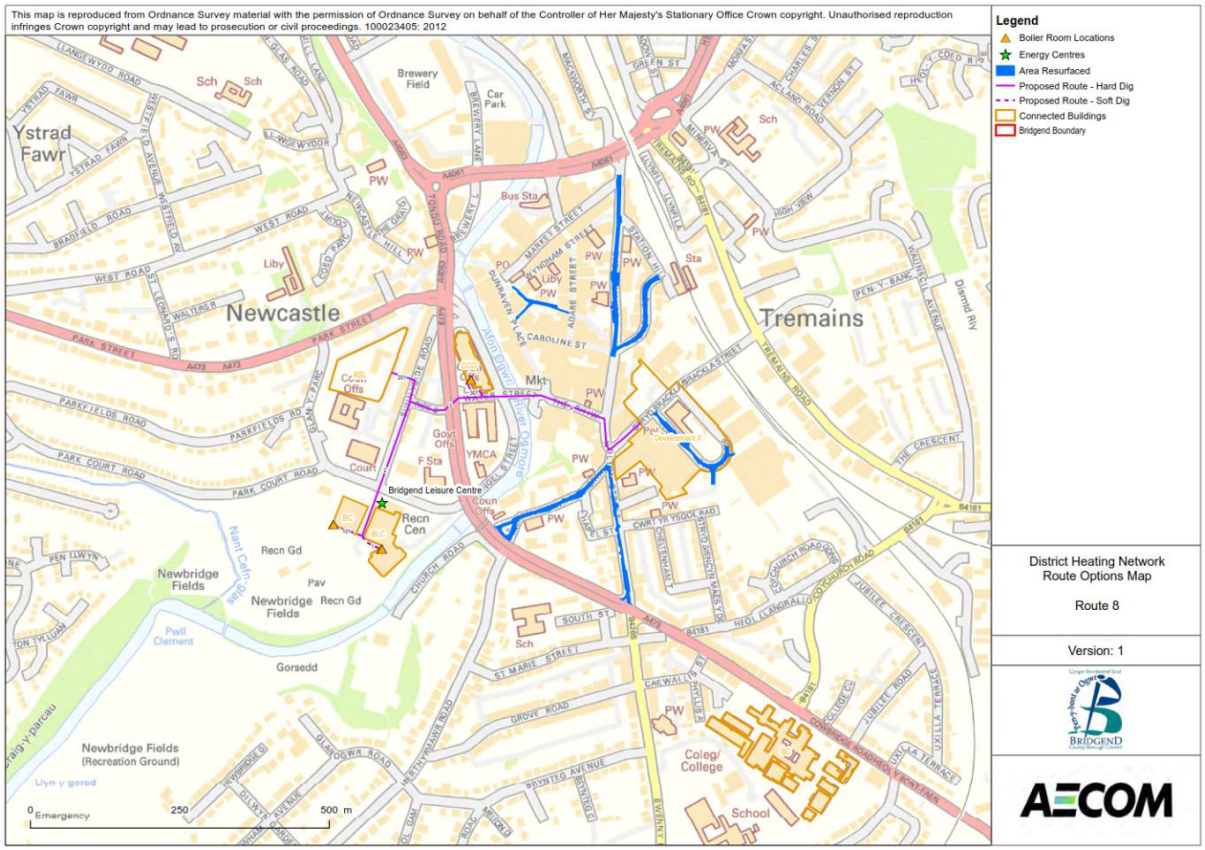
Figure 4 Hospital/Housing Phase 2 Development



Phase 3 Expansion of Civic Centre Scheme

Phase 3 of the scheme (see Figure 5 below) aims to connect buildings around the Civic Centre scheme such as the Department of Works and Pensions buildings as well as expanding across the river and connecting to new developments within Bridgend Town Centre. Key to this expansion will be integrating the scheme into the BCBC regeneration plans for the town centre.

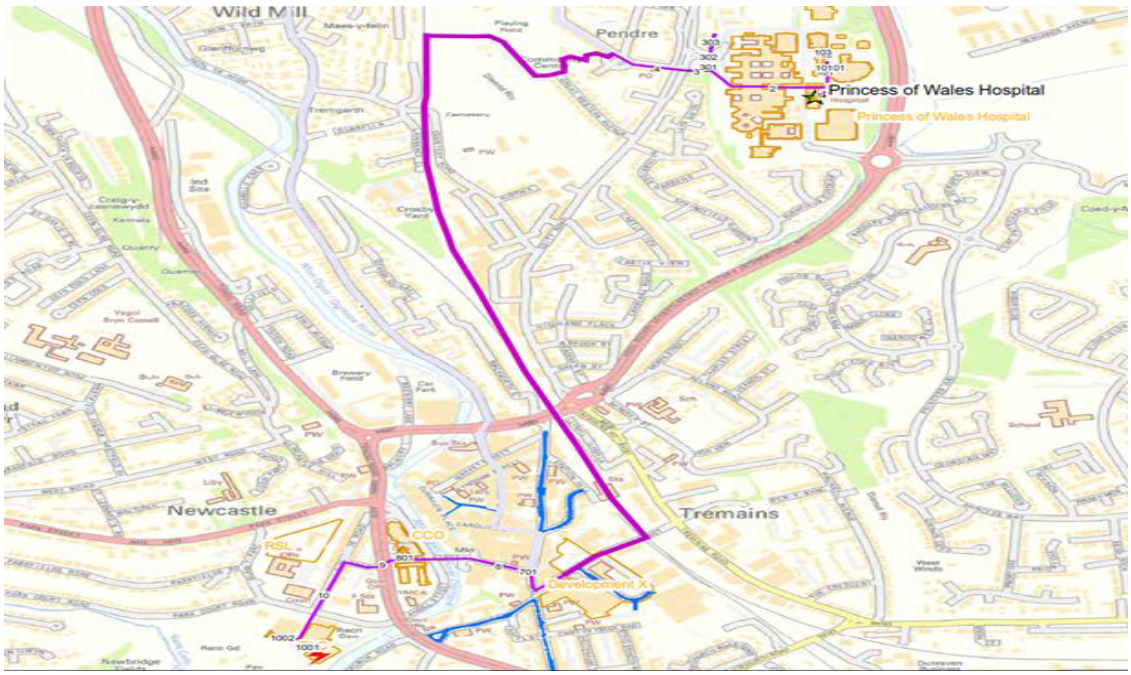
Figure 5 Expansion of the Civic Centre Scheme



Phase 4 Connect Heat Networks Together

Phase 4 of the scheme aims to connect the expanded Civic Centre network with the hospital/housing scheme located to the north-east of the town centre (see Figure 6 below).

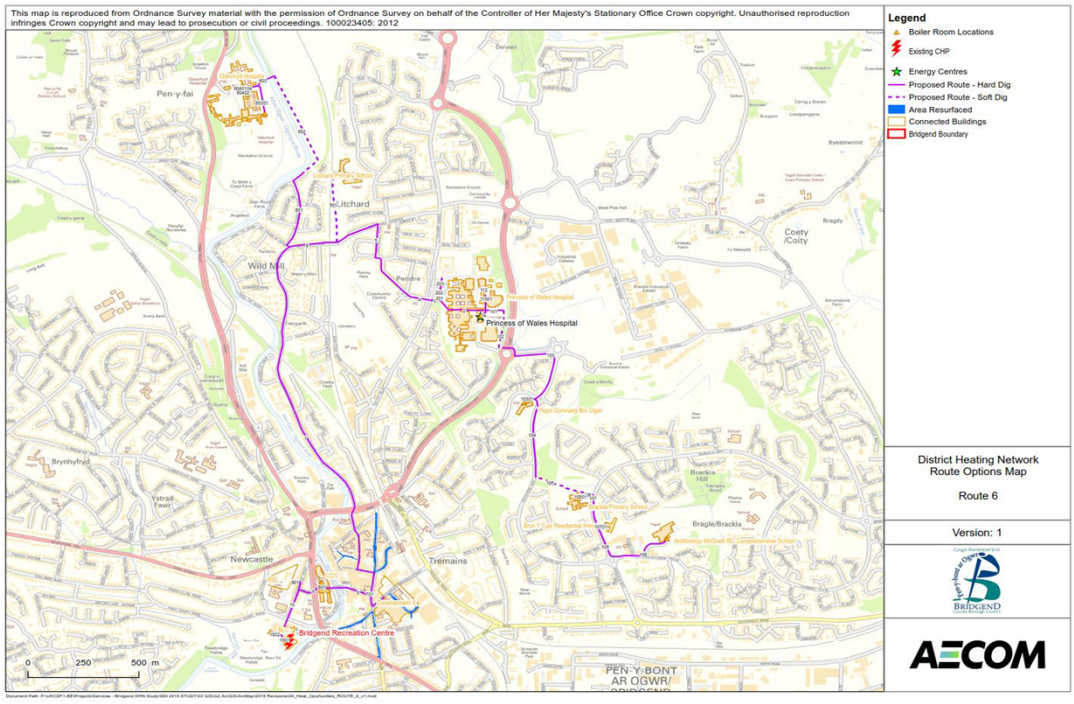
Figure 6 Connected Bridgend Schemes



Phase 5 Extension to Brackla Cluster

Phase 5 of the network (see Figure 7 below) sees the scheme expanded eastwards to connect Ysgol Gymraeg Bro Ogwr, Brackla Primary School, Bryn Y Cae Residential Home, Archbishop McGrath RC Comprehensive School and housing within the Brackla community which is relatively dense.

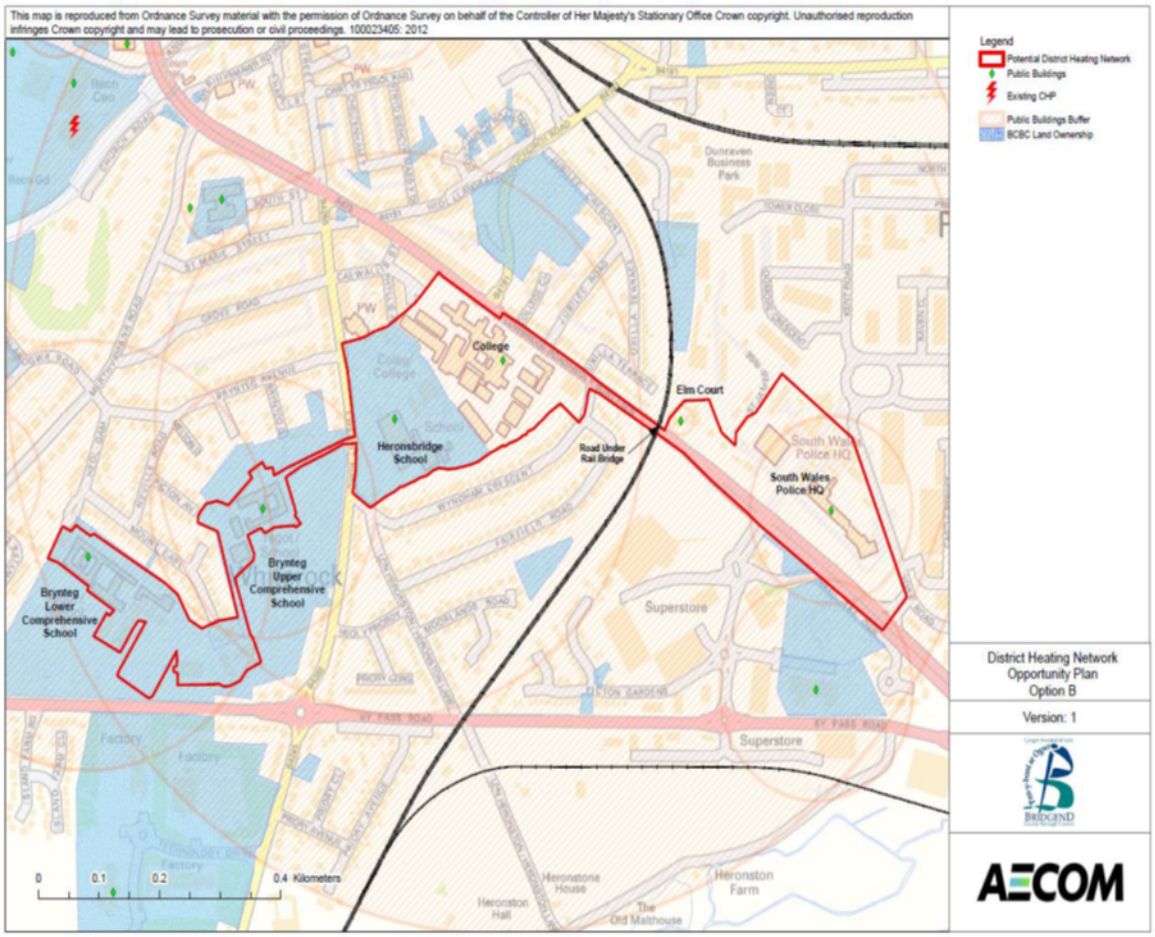
Figure 7 Extension to Brackla Cluster



Phase 6 Extension South of Town Centre

Phase 6 of the scheme (see Figure 8) looks at the network expanding south of Brackla to pick up the Parc Afon Ewenny development, South Wales Police Headquarters, Heronsbridge School, Brynteg Comprehensive, Bridgend Industrial, Bridgend Resource Centre and ultimately the Ford plant.

Figure 8 Southern Extension



2.2.3 Objectives

The start-up project will initially connect 3 buildings and the Sunnyside Development, providing long term, secure heat supplies over a 50 year period. The objectives in connecting buildings to the Bridgend Town Centre Heat Network are:

- Reduce costs below the business as usual (BAU).
- Reduce carbon emissions compared to BAU provision
- Deliver enhanced security of supply for customers and improved system resilience.

However, the council has aspirations that the network will continue to expand. As such BCBC's long term, strategic expansion objectives could be summarised as ensuring the network infrastructure that is established will:

- Continue to expand to connect additional public and private sector buildings.
- Continue to provide reduced energy costs for customers compared to individual building based boilers.
- Provide clear carbon emission savings compared to conventional alternatives and, over time, achieve decarbonisation of the heat supplies.
- Drive local economic development and build a local skills base.
- Achieve social benefits through addressing fuel poverty and health improvements amongst local residents.

2.2.4 Benefits being sought

Table 2 Targeted main benefits split by stakeholder group

Stakeholder	Main benefits by stakeholder group / customer
1 Customers	Reduction of costs of energy to connected buildings of between 5 - 10% indexed lifetime heating costs savings compared to the counterfactual/Business as Usual[1].
2 LA	Reduction of CO_2 emissions by 600 tonnes/year on completion of the installation of the start-up scheme.
3 Authority Area	Generation of 4 new jobs through the Capex and Opex phases of the project.

2.2.5 Inter-Dependencies, Assumptions & Constraints

Internal factors

Discussions and meetings with the Principal Surveyor in the Council's Property and Facilities Management Team have taken place to explain the costs and benefits to be derived from connection of the Council's buildings to the heat network.

Liaison with the Group manager for Sports and Physical Activity has been conducted. This manager is responsible for day-to-day management of the contract with Greenwich Leisure/Halo for maintaining the Council's Leisure facilities.

While in principle internal agreement has been reached to allow connection, final agreement needs to take place in liaison with senior management with specific input and approvals sought from Finance and Legal departments. These discussions will be informed by outputs from the financial and legal consultants procured to feed into the business case.

The internal process for final project sign off will be made by those BCBC elected members who form the Cabinet. A formal report will be made to them containing the outline business case for the project with recommendations for proceeding with the project.

External factors

Mutually acceptable terms will need to be agreed with Greenwich Leisure/Halo, including related to the existing CHP. This will be achieved through the governance arrangements already in place which include the monthly operational meeting. The commercial consultants will take forward more detailed contractual discussion with Greenwich/Halo. These discussions will also need to consider how the project will continue once the current Halo contract comes to an end in 2027.

2.3 Identify, assess and mitigate high level potential risks

Table 3 below sets out the high level potential risks that have been identified and the intended mitigation measures.

Table 3 High Level Potential Risks and Mitigation Measures

Risks	Mitigation
Insufficient engagement from the key internal and external stakeholders	Establishment of a Project Board for the Town heat network project with representation from senior people within the key organisations, including Bridgend Property Team.
Lack of high level internal support within the local	Continued close liaison with responsible directors within BCBC (e.g. Director of Communities, and

[1] Need to reference this back to Appendix 4 of AECOM March 2017 report

authority	Head of Service (Finance)), plus engagement with/from CEO and Members.
The LA has established a high profile in the area of heat networks and, in many ways, is considered to be leading Wales. Failure to deliver a successful, operating scheme may risk damaging the council's reputation for being an environmental leader.	Focus efforts on developing this deliverable scheme, establishing the necessary governance arrangements and project plan to implement the project.
Failure to develop funding package to deliver the scheme.	Build a business case that is broader than just financial returns. Demonstrate how scheme can reduce carbon, provide energy resilience, address fuel poverty etc.

Risk Statement

BCBC has traditionally not been an active player within major energy projects. The Bridgend Town Civic Centre heat network project will be the first step into the heat network market for the authority and the first major energy project it has delivered.

The management of risk and exposure to financial risk is a key consideration of BCBC when developing and delivering this project. As such BCBC is committed to the project provided that:

1. The capital cost of the scheme does not exceed £2M
2. The Internal Rate of Return exceeds 4%
3. Mutually acceptable contractual terms can be agreed with Greenwich Leisure/Halo that results in clear energy cost savings for the connected buildings.
4. A suitable delivery vehicle can be created through which the project is delivered.

3.0 Economic Case (Options Appraisal)

3.1 Purpose

The purpose of this section is to summarise the available options and their likely impact in terms of qualitative and quantitative factors. Using an evidence-based assessment, it recommends the Preferred Option for the Project and confirms that this represents a benefit when compared to the Counterfactual. The Preferred Option will be taken through for implementation and delivery options assessment within the later Cases of this document.

This Economic Case is set out using the following headings:

- Critical Success Factors
- Long list of options
- Short list of options (including confirmation of the Preferred Option)

3.2 Critical Success Factors

Critical Success Factors are the key attributes on which successful delivery is dependent. The following have been determined by BCBC to be Critical Success Factors for this Project:

- Willingness of the largest customers to commit to long term heat supply contracts
- Start-up scheme identified which is of a scale which is deliverable
- Potential for BCBC to control the future strategic direction of the Project
- Financial viability

3.3 Long list of options

In March 2017, a Bridgend District Heating Networks Feasibility Study (Opportunities Identification and Economic Viability Assessment) was completed by AECOM. In this section we detail the outcome of this feasibility study and how this determined the options.

The feasibility study considered the nature and scale of the existing and potential future energy demands in Bridgend and how these could be served by a district heating network. It considered the energy loads at existing buildings and likely loads for identified redevelopment sites, and what are likely to be the most suitable heat sources.

Four key energy clusters were identified, based on assessment of existing heat loads (both domestic and non-domestic) and their location relative to each other:

A. Llynfi: Llynfi Power Station, Bridgend Paper Mill
B. Litchard: Princess of Wales (POW) Hospital, Glanrhyd Hospital, Litchard Primary (LP) School
C. Brackla: Ysgol Gymraeg Bro Ogwr, Brackla Primary School, Bryn Y Cae Residential Home, Archbishop McGrath RC Comprehensive School
D. Town Centre: Civic Centre Offices (CCO), Bowls Centre, Bridgend Life Centre, Development X, RSL residences, etc.

There were three options for energy centre locations: biomass heat from Llynfi Power Station, CHP at Princess of Wales Hospital, and CHP at Bridgend Life Centre.

Techno-economic modelling was performed on scenarios refined from these options and clusters, and excluded Llynfi Power Station and the town centre new developments to eliminate uncertainties. Llynfi Power station was eliminated due to significant uncertainty regarding whether the proposed power station would be constructed and the significant distance (6km) heat from the power station would need to be transported to reach the main, higher density demand area i.e. Bridgend Town Centre.

A technical and financial assessment was conducted and 11 different route options (the long list) were considered, with different combinations of clusters and different connections within these area clusters. These options are summarised in the next section.

3.3.1 Summary of options

The following options have been considered as the longlist:

i. Town Centre – Existing Buildings
ii Town Centre – Existing Buildings & PW[2] to CCO
iii Litchard – ABMU[3] Hospitals excl. LP (CHP 17/7[4])
iv Litchard – ABMU Hospitals excl. LP (PW, CHP 17/7)
v Litchard – ABMU Hospitals excl. LP (CHP 24/7[5])
vi Litchard – ABMU Hospitals excl. LP (Rail CHP 24/7)
vii Litchard – ABMU Hospitals (soft dig via LP)
viii Litchard & Town Centre – Rail
ix POW & Town Centre – Rail
x POW & Town Centre (incl. DEVX[6]) – Rail
xi POW & Town Centre – Rail (24/7)

3.3.2 Economic appraisal of options

Results of AECOM's techno-economic assessment on the longlist (Feasibility Study) are summarised in the table below.

Table 4 Techno-economic model results

Option	Total capex (£m)	Unindexed 30y Project IRR (%)	NPV – 30y @ 6% (£m)	Simple Payback (y)
i. Town Centre – Existing Buildings	1.72	2.11%	-0.54	23
ii Town Centre – Existing Buildings & PW to CCO	1.86	3.90%	-0.33	17
iii Litchard – ABMU Hospitals excl. LP (CHP 17/7)	7.97	1.78%	-2.86	23
iv Litchard – ABMU Hospitals excl. LP (PW, CHP 17/7)	8.83	1.37%	-3.44	24
v Litchard – ABMU Hospitals excl. LP (CHP 24/7)	7.60	3.25%	-1.85	18
vi Litchard – ABMU Hospitals excl. LP (Rail CHP 24/7)	6.98	4.10%	-1.20	16
vii Litchard – ABMU	7.83	2.03%	-2.65	22

[2] Private Wire
[3] Abertawe Bro Morgannwg University (ABMU) Health Board
[4] CHP running hours of 17 hours per day, 7 days per week
[5] CHP running hours of 24 hours per day, 7 days per week
[6] Undisclosed (sensitive) development due to be completed in 2024

Hospitals (soft dig via LP)				
viii Litchard & Town Centre – Rail	10.7	No return	-5.44	No payback achieved
ix POW & Town Centre – Rail	7.02	3.10%	-1.79	20
x POW & Town Centre (incl. DEVX) – Rail	7.81	2.35%	-2.45	21
xi POW & Town Centre – Rail (24/7)	6.57	5.02%	-0.61	15

Note: Those highlighted in grey show the highest Project IRRs and shortest payback periods.

3.3.3 Preferred way forward

The techno-economic modelling performed as part of the feasibility study shows that xi (Princess of Wales Hospital and town centre existing buildings) offers the best overall financial performance. Model ii (town centre) and vi (ABMU Hospitals) are the two next most viable options, with a 30-year IRR of 3.9% and 4.1% respectively.

These three options are therefore selected to take forward to the shortlist:

A – Two Hospitals (was vi)
B – Town Centre (was ii)
C – PoW Hospital and Town Centre (was xi)

3.3.4 Define the underpinning workstreams and activities

This Project involves the following workstreams and activities:

- the installation of a gas-fired CHP
- the installation of back-up boilers
- the installation of a heat network
- the installation of a private wire/grid connection
- operating and maintaining the above assets
- the supply of heat
- the supply of electricity

The delivery of the above workstreams and activities are considered in this Outline Business Case.

3.4 Short list of options

The following options are the shortlist for this Outline Business Case.

Table 5 Short list of options

Option	Description
A – Two Hospitals	1.6MW_e Gas engine CHP and back-up boilers at PoW hospital with the heat network supplying both the PoW and Glanrhyd. Heat demand: 12.8 GWh/a
B – Town Centre	0.4MW_e Gas engine CHP and back-up boilers at the Bridgend Life Centre with the heat network suppling the two recreation centre buildings and CCO. There would also be a private wire from the Life Centre to CCO.

	Heat demand: 2.9 GWh/a
C – PoW Hospital and Town Centre	1.6MW_e Gas CHP and back-up boilers at the PoW hospital with the heat network supplying both the PoW and the buildings in the town centre. Heat demand: 11.7 GWh/a

3.4.1 Economic appraisal

An economic appraisal of the options was performed as part of the Feasibility Study, the outputs of which are summarised in the 'Long list of options' section. This assessment has been combined with the qualitative benefits appraisal below, to determine the Preferred Option.

3.4.2 Optimism bias

See Financial Case.

3.4.3 Qualitative benefits appraisal

The table below appraises each of the shortlisted options against the Project objectives and the Critical Success Factors.

Table 6 Qualitative benefits appraisal

Option	**A – Two Hospitals**	**B – Town Centre**	**C – PoW Hospital and Town Centre**
PROJECT OBJECTIVES:			
1. Reduce energy costs for customers	**8/10** The potential cost savings from implementation of the network are substantial. This is due to the significant magnitude of the loads to be met.	**5/10** The initial cost savings from implementation of this network are modest in comparision to the alternative options. This is primarily due to the lower magnitude of the loads to be supplied.	**8/10** The potential cost savings from implementation of the network are substantial, again due to the significant magnitude of the demand to be supplied.
2. Reduce carbon emissions	**8/10** The potential carbon emission savings from implementation of the network are substantial, as the magnitude and duration of the loads allow for substantial heat and power generation from CHP	**5/10** The initial carbon emission savings from this network are modest in comparision to the alternative options. This is primarily due to the lower magnitude of the loads to be displaced by CHP.	**8/10** The potential carbon emission savings from implementation of this network are substantial, as the magnitude and duration of the loads again allow for substantial heat and power generation from CHP
3. Help drive local economic development	**3/10** The area between the two hospitals primarily consists of low density residential development. Hence,	**7/10** Local businesses are located in close proxitinity to the network and future expansion would allow the centre of the town	**8/10** The route of the network through the town would allow businesses in the centre to connected to the network, providing

	there is little opportunity to supply local businesses and contribute to local economic development.	to be supplied with low cost heat.	them with the economic benefit of access to low cost heat.
4. Expand to connect additional buildings	**7/10** The network would allow future expansition through the connection of buildings along the route between the two hospitals and further afield.	**8/10** The network will be sized to allow connection of additional buildings, both within the immediate vicinity of the energy centre and further afield. Hence, this option will be designed for future expansion	**7/10** The network would allow future expansion through connection of additional buildings between the PoW and the town centre.
CRITICAL SUCCESS FACTORS:			
1. Willingness of the largest customers to commit to long term heat supply contracts.	**3/10** This option relies on the Health Board agreeing to both of its hospitals in Bridgend being connected. Wide ranging conversations with the Health Board indicated they were hesitant to do this.	**8/10** The buildings which will initially be supplied by this network are owned by BCBC. Hence, BCBC has direct control over whether the buildings will connect to the network.	**4/10** This option relies on the willingness of the Health Board to commit its primary hospital in Bridgend as the main anchor load. Extensive discussions with the Health Board indicated that they were reluctant to do so.
2. Start up scheme identified which is of a scale which is deliverable	**3/10** This option has a large start-up, capital cost (£6.98m)[7] making it difficult to pursue as a start-up network.	**9/10** – This option has a relatively low capital cost (£1.86m), as well as only linking a small number of buildings.	**3/10** This option has a large capital cost (£6.57m) again making it difficult to pursue as an initial network.
3. Potential for BCBC to control the future strategic direction of the Project.	**3/10** The vast majority of the heat load for this network is due to the Health Board, who would have exerted a significant amount of control over the network. Therefore, the ability of BCBC to control the future strategic direction of this Project is highly limited.	**8/10** As this option would supply BCBC buildings it will enable BCBC to control the initial Project and the future strategic direction of the Project as it expands.	**5/10** By far the largest heat load on this network is the Health Board's PoW Hospital. Given the dominant nature of this load, the ability of BCBC to control the future direction of the Project is constrained.
4. Financial viability	**5/10** This Project has a mid single digit Internal Rate of	**5/10** This Project has a mid single digit Internal Rate of	**6/10** This network has a Project IRR of 5.02%, making it

[7] Table 7 Bridgend District Heating Networks Feasibility Study – Draft Report March 2017

	Return (4.10%) when considered over a 30 year life.	Return (3.90%) when considered over a 30 year period.	slightly higher than the other two options.
Summary/ Score	**OBJ: 26/40** **CSF: 14/40** **TOT: 40/80**	**OBJ: 25/40** **CSF: 30/40** **TOT: 55/80**	**OBJ: 31/40** **CSF: 18/40** **TOT: 49/80**

The table above shows that Option B – Town Centre receives the highest overall score. This option is the most deliverable as it is not reliant on the willingness of the Health Board to commit its primary hospital in Bridgend as the main anchor load, which they appear reluctant to do. Option B scores lower than the other options in terms of meeting the project objectives of reduced energy costs and reduced carbon emissions due to its smaller scale, however, it does contribute strongly to driving economic development and offers opportunities for expansion.

3.4.4 Wider / sustainability impact appraisal of options

In this section, we discuss a number of wider/sustainability impacts, which are considered applicable to the shortlisted options, but are not differentiating factors being similar across all options. Therefore, they are not included in the table above.

Resilience / security of heat and electricity supply

With increased energy generation close to the location of use, the development of a heat network improves the security of heat and electricity supply to the local area. This offers a resilience strategy to BCBC and other offtakers. Although the gas-fired CHP is reliant on the grid for its input fuel, reliance on the electricity grid is much decreased. Furthermore, as future heat sources will be explored as an alternative to CHP later in the Project life, lower carbon heat sources with reduced reliance on the gas grid may be available.

Air quality

Installation of a heat network (which is technology agnostic) offers the opportunity to explore alternative heat sources (e.g. heat pumps, waste heat) through the life of the Project, which could have a significant impact on local air quality.

Reputational benefits

The delivery of this Project would represent the first town centre heat network in Wales. In this way, this Project will act as a flagship for other local authorities and communities. There may be opportunities to share skills and experience (possibly for a fee) with other local authorities, which are less advanced in the development of heat networks.

3.4.5 Preferred Option

Although Option A and Option C present greater opportunities to deliver carbon and energy cost savings, they are considered undeliverable due to the requirement for the Health Board to agree to connect its hospital(s) to the network. Extensive discussions with the Health Board indicate that they are reluctant to do this. These options are therefore discounted.

Based on the assessment made in this section, **Option B – Town Centre** is the Preferred Option. This option is of a scale which is deliverable, is within the gift of BCBC to deliver and allows control over the future strategic direction of the Project, thus facilitating future expansion.

3.4.6 Comparison to Counterfactual – 'business as usual'

The Counterfactual was not a modelled option in the Feasibility Study so does not feature in the analysis above. However, to confirm that the Preferred Option (Project) represents an improvement on the Counterfactual, we compare below the Net Present Cost (NPC) of the cashflows which would occur in the Project as compared to the cashflows which would occur if

each offtaker had its own boilers for the provision of heat, and purchases electricity from the grid (the Counterfactual). The costs in the table below include VAT.

Table 7 Comparison of Project Cost to Business As Usual Cost

Comparison of Project Cost to Business As Usual Cost	NPC £000s
Project capex (CHP, boilers, heat network etc.)	2,903
Project maintenance	1,029
Gas cost (excl. CCL)	3,738
Electricity income from grid	(573)
Total Project Cost	**7,097**
Boiler capex	59
Boiler maintenance	210
Gas costs (incl. CCL)	2,625
Electricity cost (incl. CCL)	4,893
Total Business as Usual Cost	7,787
Benefit of Project	**690**
Percentage Benefit of Project	**9%**

The table above highlights the costs of the Project are 9% (£690k) lower in NPC terms, when compared to the cost of the Counterfactual. Please note that the costs of delivering the Project (e.g. business rates, ESCO costs, lease, breakage costs) are not included in the Project costs above as they are subject to the delivery options assessment preformed within the Commercial Case and also the Financial Case. Further comparison against the cost of the Counterfactual from the consumer perspective is included in the Financial Case to demonstrate that once these delivery costs are included, the Project still represents a financial benefit to consumers.

Note: The boiler costs for the project and business as usual scenarios shown in the table above reflect the capacities assumed in the Technical Feasibility Study. It is possible that the required boiler capacity for both the project and business as usual have been underestimated. However, this is not expected to have a significant impact on the *difference* in NPC between the project and business as usual.

3.4.7 Risk appraisal

In this section we discuss risks which may impact the decision to proceed with the Project rather than the Counterfactual/Business as Usual.

If the CCL exemption within the Project (due to GQCHP) is not applicable (either due to lower heat usage than anticipated or a change in law), the cost of gas would increase by £743k in NPV terms, which would generate a disbenefit of -£53k when compared to the Counterfactual. This shows that the Project benefit is highly sensitive to the CCL exemption assumption and that receipt of this exemption is paramount to achieving a benefit against the Counterfactual.

Other than the RSL flats, all buildings are within the control/strong influence of BCBC and therefore there is little risk of inaccurate understanding of the energy loads or non-connection of these buildings. However RSL flats is an external party and therefore it is more difficult to control/influence their decision to connect to the network. That said, interaction with RSL flats to date has demonstrated strong support for being part of the district heat network, through adoption of communal heating on the Sunnyside site. Close engagement with RSL flats will be maintained throughout the commercialisation and procurement phase of this

Project. If this load did not connect, a reassessment of the capital expenditure required for the reduced heat load would need to be made.

Further sensitivity on the Project economics in line with risks is performed within the Financial Case.

3.4.8 Confirmation of Preferred Option

We set out below the key differences between the Counterfactual and the Preferred Option. The financial metrics below confirm that the Preferred Option represents value for money and should be taken forward for further detailed assessment in this Outline Business Case.

Table 8 Counterfactual compared to Preferred Option

	Counterfactual	**Preferred Option**
Scope of work	Energy requirements are met through the purchase of gas and electricity and via gas boilers (existing and replacements as required)	Energy requirements are met through installation of a gas-fired CHP supplying heat and electricity
Delivery mechanism	Ad-hoc purchase of gas, electricity and boilers	To be determined within Commercial Case but may involve a design, build, operate and maintain contract (combined or separate)
Delivery partner	Ad-hoc	To be determined within Commercial Case
Delivery timescales	On-going	50 years from start of operation
Funding options	Existing budgets	To be determined within Financial Case but may involve a combination of grant and loan
Net Present Cost (NPC) – per table above	£7,787k	£7,079 (representing a benefit of £690k or 9% against the counterfactual)
Carbon savings	Nil	The Feasibility study notes 600 tonnes of carbon savings per annum. The 'value' of carbon is subject to interpretation. A value of £60/tonne[8] has been assumed by BCBC, which would add savings in the region of £36,000 per annum. This figure may reduce over time due to decarbonisation of the grid.

3.4.9 Conclusion

Following the analysis performed during the Feasibility Study, the financial returns, the deliverability and the wider strategic benefits of creating a combined network, the Base Case Preferred Option is **Option B – Town Centre Network**.
From the Counterfactual analysis, it is clear that developing a heat network offers a greater financial benefit than continuing with a business as usual approach.

[8] Ranges between £4-116/ tonne (BEIS Updated Short-Term Traded Carbon Values March 2017)

4.0 Commercial Case

4.1 Procurement & Commercial Strategy

4.1.1 Commercial Strategy

A Delivery Structure: Introduction and Process:

There are a wide range of potential delivery structures for a district heating project. There are several good examples of different structures being used successfully to deliver district heating. There is no settled delivery model or best practice structure. The delivery structure for each project is chosen for that project based on the strategic objectives of the project stakeholders and any project constraints.

The projects can be separated out into business areas and development phases. The key business areas are generation, distribution and supply of heat. The key phases / activities are design and build, operation and maintenance, and metering and billing. This leads to a range of roles and responsibilities on the project and there are a variety of means by which these may be allocated.

The project team has considered the full range of options from wholly public sector led models through concession and joint venture models to wholly private sector models and potential variants. This included the use of an energy services company (or ESCO) as a delivery vehicle for the chosen model.

To derive a shortlist for delivery structures the project team and advisers considered the following key items:

1. The project objectives as described in the strategic case. The strategic case describes a number of wider Council and Welsh Government objectives that this project will support. Focussing on the immediate objectives for this project, the key objectives are recorded as:
    - Deliverability. Demonstrating the heat network on a manageable scale and establishing reputation.
    - Reduced energy costs. The project should provide reduced energy costs for customers compared to business as usual provision.
    - Carbon reduction. The project should provide clear carbon emission savings compared to conventional alternatives and, over time, achieve decarbonisation of the heat supplies.
    - Security of Supply. The project should deliver enhanced reliability and improved system resilience for customers when compared to individual solutions.
    - Providing for potential expansion. The network should be capable of expanding to connect additional public and private sector buildings and residential dwellings. The latter is particularly important to achieve the additional social benefits of addressing fuel poverty among local residents.
    - Economic development. The project should drive local economic development and build a local skills base.
    - Support Strategic Council and Welsh Government Objectives. The project should contribute to the achievement of wider objectives for Bridgend and Wales as outlined in the strategic case.
2. The Council's (and other stakeholders') appetite for risk and desire for control of the project and its benefits. Generally speaking, the more control a party obtains over the project or a particular aspect of it, the more risk it will have to accept. Consequently,

if it is important for a large degree of risk transfer to be achieved, that may mean giving up a large degree of control.

3. Identified constraints. The Council's outsourced leisure facilities have been identified as a constraint. The proposed energy centre and two of the proposed customer facilities (the Bridgend Life Centre and the Indoor Bowls Centre) are currently operated under an outsourcing contract with Greenwich Leisure Limited (GLL). The operational services are then sub-contracted to Halo Leisure Limited (Halo). This contract is long-term with an expiry date of 31 March 2027. Any project delivery structure therefore has to specifically deal with GLL's and Halo's rights and responsibilities as potential suppliers or customers of heat and as current operators of the heat plant. It is also noted that the interface with Halo is also a potential complication that may hinder a private sector led project. The private sector would have less flexibility around the energy centre and may be concerned about the working interface with Halo. These issues can be overcome but may affect market appetite and pricing.

Financial constraints and return rates have also been identified as constraints impacting the delivery model. These are further explored in the financial case.

Based on early discussions of both stakeholder and project objectives three delivery structures with a variant were shortlisted. A wholly private sector model was discounted early in discussions given that GLL/ Halo indicated that they did not want to deliver the project in its entirety and no other private sector parties have been identified who would be willing to sponsor and take forward this project. In addition, for wider strategic reasons outlined in the strategic case and discussed further below, the Council's preference would be to have some level of direct participation in the project.

The shortlisted options focussed on the relationship between Halo/GLL and the Council as the two core stakeholders in the project given the location and extent of the proposed network. From herein we will refer to Halo only, however, please note that any changes required to the leisure centre contract would need to go through GLL to Halo.

- **Option 1** – Halo retain and upgrade CHP assets becoming bulk heat supplier to a Council led network.
- **Option 2** – Halo and Council enter into a joint venture for the project – the CHP assets are transferred to the JV vehicle which also owns the heat network. The Council and Halo are customers of the network.
- **Option 3** – Council take over and upgrade CHP assets as part of a Council owned project. Halo is a customer of the network only.
    - **Variation to Option 3** – the Council owned project is delivered using a separate project vehicle (ESCO). The ESCO would be established as a private company limited by shares 100% owned by the Council.

B Preferred Delivery Structure

The options were discussed with all key stakeholders and within the Council both individually and at a stakeholder workshop for the project. Discussions took place in light of the project objectives, key constraints and wider potential low carbon energy strategy within the Council. The relative benefits and advantages of each option were considered. Following this process, Option 3 with the use of an ESCO emerged as the preferred option and it is this option that will form the basis for the remainder of the Commercial Case.

The key benefits and opportunities for Option 3 generally can be summarised as follows:

- Council retains more control over the project and its strategic objectives including future expansion of the network and can support the ESCO to deliver associated projects across Bridgend.
- Council resources can be deployed on the project to keep project costs down (assuming those resources are available).

- The project can be more easily aligned with socio economic objectives at the expense of overall project returns, if necessary. This is particularly relevant where the Linc Cymru Sunnyside Road development is being considered as a key customer and the Council is keen to ensure that tenants can afford to heat their homes.
- If the project is successful, returns generated by the project can be redeployed to support other Council/ ESCO initiatives and thus retain maximum project value within Bridgend.
- The Council can develop skills and expertise by taking the lead in the project which can then be retained within Bridgend and within the ESCO.
- A Council led scheme may be able to access a wider pool of grant or low cost funding (subject to state aid controls (see section B of the Procurement Strategy below)).

The key risks and barriers identified are:

- The Council may need to recruit or procure additional resource to be able to deliver the project. Some of this may need to be allocated to the ESCO (see delivery vehicle section below). A significant level of resource will be required to deliver a major infrastructure project such as this, particularly in the early stages of specification and options appraisal and perhaps before the ESCO is established. To manage this risk it may be possible to outsource a large part of this work, however, that may add project cost. The resource provision for this element of the project is set out within the management case.
- Project delivery risk will ultimately rest with the Council. The physical design, works and services elements are likely to be outsourced to the private sector (see procurement strategy) and the ESCO will be established to run the project but ultimately delivery will be the responsibility of the Council. Critically, demand risk will remain with the Council as well as balancing risk, quantity and price, over the network between suppliers and end customers. These risks will be transferred to the ESCO but the Council as the 100% owner of the ESCO will retain commercial responsibility. The Council is exposed to reputational risk of project failure. This is capable of management and mitigation by good governance, a robust procurement process and contractual structure.
- The Council will be responsible for finding funding for the full capital cost of the project. This can be mitigated using grant support or low cost funding from other public sector parties (see financial case).
- Adjustment will be required to the contractual relationship currently in place with GLL/ Halo. See section E below for detail of how this can be achieved.

Each of these risks and barriers are capable of management and mitigation as described above.

C The ESCO Delivery Vehicle:

A separate delivery vehicle is rarely a requirement except in very specific cases. It is generally a matter of choice taking into account funding, project risk, management and governance considerations. In this case, the wider strategic objectives of the Council as set out in the Strategic Case are of particular relevance. The strategic case sets out the Council's ambitions for future energy and low carbon initiatives to deliver Council and Welsh Government objectives and requirements such as the Well-being of Future Generations (Wales) Act 2015, the improvement of well-being and alleviation of fuel poverty. Establishing an ESCO can enable project benefits to be retained in the ESCO vehicle for furthering these wider strategic objectives.

Benefits of an ESCO:

- An ESCO can procure and retain the necessary skills to deliver this type of specialist project which may not be available within the Council.
- An ESCO is an independent company, separate from the Council and so it can be independent i.e. it can make the best decisions to meet the overall objectives of the energy business and not necessarily be tied to changing Council priorities. The Council

can get on with the business of the Council, and the ESCO can get on with running an energy business. On other projects this is often the key driver to establish an ESCO.

- There can be step in rights should the Company fail so that the Council can take over the project i.e. it is possible for the Council to retain some project control.
- Project management, operations, maintenance functions and other risks can be transferred by the Council while the Council retains a high degree of influence / direction.
- Using an ESCO helps to package the project more easily to facilitate potential exits in future.

Risks and Barriers:

- There is a cost to set up an ESCO and ongoing costs associated with administering and managing the vehicle for example, audit, accounts, governance. These costs are not included in the financial model for this project as the intention is for the ESCO to deliver other projects and initiatives (see financial case for further information).
- The ESCO will need to be funded by the Council until such time as it can raise its own finance or generate its own revenues. It may be possible to have voluntary board members but the ESCO will have to be resourced and staff will have to be paid. These costs are not included in the financial model for this project as the intention is for the ESCO to deliver other projects and initiatives (see financial case for further information).
- An ESCO can introduce some additional procurement risk on the heat supply itself where it is providing the energy services to the public sector. However, that is capable of being managed (see procurement strategy section A).
- The ESCO will usually have an independent board – this would likely include Councillors or Council staff but also directors from the private sector, ideally with relevant expertise. This can mean that decisions are taken which the Council disagrees with. However, this separation may be important to achieve the long-term objective identified in the strategic case.

Process:

The technical process to create a company limited by shares is straightforward. A new company can be established at Companies House within a day if required. However, further work will be needed on the specific detailed terms of the constitution of the ESCO and related supplementary documents before the company is incorporated.

The ESCO's constitution is contained in its articles of association and we also recommend a shareholder agreement between the ESCO and the Council. The objectives of the ESCO can be set out in the articles of association and this can be helpful provided that they are sufficiently flexible to allow for future activities. The articles and the shareholder agreement combined will set out the governance arrangements for the ESCO and the extent of Council control of the ESCO. For example: the structure of the board of directors for the ESCO and arrangements for board meetings, voting rights of directors at board meetings and managing conflicts of interest. Importantly, there would normally be a list of reserved matters where decisions would require Council approval.

In addition there will need to be a process to appoint directors to the ESCO and time should be allowed in the programme to invite applications, interview and appoint the directors. A decision will need to be taken on whether directors will be paid or appointed on an expenses only basis. A proportion of the directors would usually be drawn from among Bridgend Councillors although they need not be the majority as the list of reserved matters will give the Council necessary controls over key decisions. As 100% shareholder, it would also be normal for the Council to have ultimate control over the appointment of directors.

D Project Stakeholders and Partners:

The following key stakeholders / partners have been identified. The majority of these stakeholders participated in a stakeholder workshop held in Bridgend on 7 September 2017 and expressed their support for the project and the preferred delivery model.

Table 9 Key stakeholders and associated roles

Stakeholder/ Partner	**Role**	**Detail**
Bridgend County Borough Council	Project sponsor and key customer	The Council are the initiator and main driver of the project. They will invest in the project and will also provide anchor heat load offtake by purchasing heat for the Council Civic Offices in the town centre.
Welsh Government	Potential Investor	The Council are currently exploring whether Welsh Government investment in the project might be possible.
Local Partnerships	Delivery support	Local Partnerships will provide delivery support as part of the Green Growth Wales Programme.
UK Government (HNIP)	Potential Investor	The Council are considering applying for HNIP funding for the project.
GLL / Halo	Key customer	As discussed above, Halo is the operator of the Bridgend Life Centre and the Indoor Bowls Centre both of which will be supplied by heat by the project. The energy centre will also be located in the Bridgend Life Centre.
Linc Cymru	Key customer	Linc Cymru is developing a new social housing development at Sunnyside Road in proximity to the project and they are a potential customer of the scheme (see customer engagement in section F below).

E Contractual Relationships with Stakeholders

There are not expected to be significant contractual relationships with stakeholders other than standard investment contracts and customer heat supply agreements. The exception is the relationship with Halo/ GLL. As described above, a long-term leisure concession contract is already in place with Halo/GLL. To achieve Option 3 as described some adjustment will be required to the leisure contract. The leisure contract has been considered and there are mechanisms within the leisure contract that may be used to achieve those adjustments. The two main routes are either:

1. **Partial Termination**. The leisure contract permits termination in part only. It would be possible for the Council to remove the energy services and the plant room from the scope of the leisure contract and essentially return those elements to Council control and responsibility.

2. **Contract Variation**. The leisure contract has a change process. It would be possible for the Council to request a variation to remove the energy services and the plant room from the scope of the leisure contract and as above, return those elements to Council control and responsibility.

With either mechanism there are points that would need to be discussed and further agreed between the parties to arrive at the optimum workable solution. These include:

- **Interface**: Transferring the energy centre back to the Council creates an interface on the leisure centre site between the operation and maintenance of the energy centre and the operation and maintenance of the leisure centre. There will need to be cooperation between the parties to ensure that both elements can be operated properly. Access rights will need to be granted to each party to the extent necessary. General building maintenance responsibility would stay with Halo. Insurance arrangements would need to be discussed. Based on discussion between the parties to date, we are confident that all of these matters can be addressed contractually to achieve a practical solution. Based on lessons learned from other projects the key is to ensure a clear allocation of roles and responsibilities in respect of the building and the energy centre and that the benefits to both parties are articulated and understood.
- **Heat and Electricity Supply**: Arrangements for the supply of energy from the Council to Halo would need to be either included in the leisure contract by amendment or Halo would need to enter into an energy supply agreement with the Council. The former option is likely to be preferable from a procurement perspective – see procurement strategy below. In any event, adjustment would be required to the existing utilities provisions within the leisure contract. Any adjustment to the electricity supply arrangements as part of the energy centre development and the potential private wire offtake to the Council should be discussed with the local grid operator, Western Power, before design and construction are procured.
- **Lease**: The lease for the leisure centre would need to be amended to remove the plant room from the leased extent. This should be straightforward subject to being clear on the boundaries of each party's responsibility.
- **Existing Plant**: There are breakages costs associated with the current CHP plant that are likely to be triggered by the proposed project structure. These costs have been taken into account in the financial model as part of the economic and financial cases.

F Customer Engagement

Demand risk is a significant risk for any district heating project and is a key risk to manage and discuss as part of the commercial case. Demand risk is substantially managed on this project as 90% of the base case heat load is being met by buildings which the Council owns and is capable of controlling. The final base case heat load is being met by Linc Cymru through a supply to its proposed Sunnyside Road development. Discussions have already taken place between the Council and Linc Cymru and Linc Cymru is keen to participate in the project. The development timelines for the Sunnyside Road development and the district heat project are aligned

Heads of terms will be issued to heat customers at the next stage of the process to confirm the key commercial terms before moving to full heat supply agreements.

4.1.2 Procurement Strategy

A Assessment of Procurement Constraints

As part of the assessment of the various delivery structure options procurement risk and constraint was assessed at 4 key procurement points. Not all of these were relevant to each delivery option. The two procurement points relevant to Option 3 with an ESCO are discussed below.

1. Procurement of heat from the network by the Council as a customer.

If the Council owns the energy i.e. it has generated the energy as the operator of the heat network then it does not need to run a further procurement to supply the energy to itself. However this is not automatically the case if the Council sets up an ESCO to operate the

network. With an ESCO model a separate procurement for the Council's consumption would not be required if the supply can be construed as a controlled persons administrative arrangement. To establish that arrangement the following tests must be met: (i) the Council exercises control over the ESCO in a similar way as it exercises control over its own departments; (ii) the percentage of supplies of energy made by the ESCO to the Council is at least 80%; and (iii) there is no private sector investment in the ESCO. If these tests are not satisfied then procurement applies as if the ESCO is a third party. In that case the Council would have to run a competition to procure heat from the project as a customer. This presents a procurement risk where a desired heat source has already been identified.

The ESCO will be 100% owned by the Council and, based on the relative heat loads identified for the town centre network, it should be possible to satisfy the 80% public sector supply test. On that basis a separate procurement should not be required. However, this will need to be specific consideration as part of the re-structure of the leisure centre heat supply arrangements. It may be preferable that the Council buys the heat from the network as the owner of the leisure facilities and then provides that to Halo through the leisure centre contract.

If a separate procurement is required it is possible to manage the risks associated with procuring a supply of heat that specifies a particular district heating solution based on the experience of other similar projects. These strategies should be explored further on future expansion of the project if additional public sector customers will be joining the network alongside a higher proportion of commercial or domestic customer.

2. Procurement of delivery contracts i.e. construction and operation.

This element is ownership option neutral. A competitive procurement will be required to appoint a contractor to design, build, operate and maintain the energy centre and the district heat network regardless of which ownership structure is chosen unless the Council opt to bring some elements in house. This is likely to be done through a single procurement (see contracting strategy below).

If the Council's requirements can be adequately specified at the outset of the procurement then a restricted procedure could be run. If there needs to be interaction with the contractor on the Council's requirements and/or significant negotiation around the contract terms then it may be more appropriate to use a competitive dialogue. Given that the preferred option on the contracting strategy is a full design, build, operate and maintain contract, a competitive dialogue is likely to be more appropriate (see contracting strategy below). Procurement delay can be mitigated by design and preparation of a robust and well developed set of procurement documents and contracts and by actively managing the procurement process to a pre-defined timetable. Sufficient resource would have to be dedicated to the procurement by the Council. It is important to note that if competitive dialogue is chosen there is no need to discuss/ negotiate all aspects of the tender/ contract. The extent of dialogue can be determined by the Council and restricted by focusing on key issues for discussion. There is no need to structure the procurement around a series of dialogue meetings.

An indicative timeline for the key procurement steps is set out in the table below.

Table 10 Indicative timeline for the key procurement steps

Procurement Stage	**Estimated Timeline**
Procurement of legal, technical and financial advisers to produce ITT and contract documentation.	12 weeks
Drafting OJEU, ITT and draft contracts.	12 weeks
Publication of OJEU	Once ITT and draft contracts are ready
Shortlisting (ESPD) responses returned	Minimum 30 days after OJEU

Shortlisting (ESPD) evaluation and decision	2 weeks
Issue of ITT	Following decision on shortlist.
ITT responses	Minimum 30 days after ITT – allow 6 weeks
Dialogue discussion/ negotiation meetings.	4 weeks
Final tender issued	Following close of dialogue
Final responses returned	4 weeks after final tender
Final evaluation and decision	4 weeks
Notice of intention to award contract	Following final decision.
Standstill Period	10 days following notice of intention to award contract
Contract Award and Contract Signature	Following standstill period

B State Aid Considerations

The Council has taken specific legal advice on the state aid risks of the preferred delivery model. It is clear that state aid considerations will apply to this project whether or not an ESCO is used because fundamentally the project involves an economic activity i.e. selling energy to customers, rather than the performance of a public function. Therefore any financial support or investment in the project by the public sector will have to be analysed for state aid purposes. Investment or lending that is made on market terms by the public sector is not state aid.

For the purposes of this project the Council will be relying on Article 46 of the General Block Exemption Regulation (GBER). This permits investment aid to be given for energy efficient district heating and cooling projects. There is an overall cap on the level of state aid that may be given under GBER and a restriction on aid intensity levels. The financial case takes these restrictions into account in determining the maximum state aid allowable amount for the project as a whole and hence the structure of grant funding/soft investment to investment on market terms.

4.2 Contracting Strategy

The Council ESCO need not actually design, build, operate and maintain the network or manage the customer interface. In fact it is assumed that this is not possible because neither the Council nor a start-up ESCO vehicle will have the capacity to perform these tasks at present. Therefore, the performance of these tasks will likely need to be outsourced.

The core tasks are:

- Design of the energy centre and network.
- Installation / construction of the energy centre and network.
- Supply of pipes.
- Maintenance of the energy centre and network.
- Operation of the energy centre and network, which may or may not include metering and billing and customer interface.

There are a range of options for procuring the performance of these tasks with risks and benefits associated with each. We have focussed on three main options here but there can be variations within this e.g. some packages could be joined together and some services could be performed in house.

A Design, Build, Operate, Maintain package

1. Design Build Operate and Maintain package.

A single contractor is appointed to deliver all elements of the project for the Council based on an outline design and services specification. The contractor will take responsibility for every element of the construction of the energy centre and the network on a Turnkey EPC basis and will hand over a completed project to the Council once it has passed commissioning tests. The Contractor will then also be responsible for maintaining and operating the project to an agreed standard. The Contractor could also be made responsible for managing the customer contracts – primarily metering and billing.

2. Turnkey EPC contract for construction only with O&M separated.

This is essentially the same as the DBOM package above but only in respect of the construction phase. Separate arrangements would be needed for O&M. Metering and billing could be included or outsourced separately. This is similar to a DBOM package in terms of risks and benefits but there is the potential to attract a wider pool of contractors. It also provides more flexibility and control over the approach to operations but less cost certainty for that phase.

3. Multi contracts strategy

This involves separate contracts for each key element of the project including the construction works i.e. a designer is appointed to design the network, a construction contractor is procured to build that design and install the pipes, pipes (and potentially other equipment) are procured separately. A project manager is appointed to manage the various contract packages. Project management may also be done in house if there are suitably qualified project managers to run the contracts. In many respects the risks and benefits are the reverse of an EPC or DBOM contract.

B Preferred Approach

The Council considered each of the above options but it is recognised that there is limited in-house resource within the Council or within a newly established ESCO to effectively manage a multi-contracts strategy and the Council's preference is to achieve a higher level of risk transfer to the private sector contractors. A turnkey EPC contract is therefore preferred. From a risk perspective, bringing the O&M contractor into the single contract would also provide additional benefit. Metering and billing could be contracted for separately or retained in-house given the number of customers. The benefits and risks of this approach are set out below.

The Council also intend to use the competitive procurement process to ensure that additional community benefits are retained for Bridgend through the outsourcing of these tasks. These are referred to in the strategic case (section 2.2.1) but include local employment and the development of a local skills base and SME supply chain.

Benefits and Opportunities:

- Single point of contact means no interface for the ESCO to manage. This is particularly useful for defects risk as the single point of responsibility for any defect will be the contractor. There is also a single procurement process to run.
- Cost certainty is provided subject to standard exceptions. It is noted that there may be project specific risks where it is agreed that the ESCO and not the Contractor bears the risks (e.g. particular identified site condition issues or Council prescribed programme restrictions due to other activities in the town centre). No such specific risks have been identified on this project to date.
- Time certainty with LDs for late delivery. Note that this provides some compensation for late delivery and it incentivises on-time delivery however it does not guarantee delivery by a certain date. If the project has a hard deadline e.g. funding or customer deadlines then it is important to factor in other mechanisms to try to manage delay risk.
- Performance testing to ensure the energy centre and network will deliver to the specification for the operations phase can be managed by the private sector.

- Operational performance and failures can be linked to customer contracts to protect the ESCO from risk of downtime.

Risks and Barriers identified:

- A DBOM package offers cost certainty over a long period but the degree of risk transfer achieved through this will likely add a risk premium to the contract price. This could mean the overall price is higher than the sum of the individual contracts in a multi contract package.
- Detailed design would be delayed until the end of the procurement process for the contract causing overall project delay. This can be mitigated by managing the procurement process itself.
- The procurement process may be longer as a competitive dialogue would likely be required for a contract of this nature which is not straightforward. However this can be managed using a clear process sticking to an agreed timetable and only having dialogue on those elements of the project that cannot be fully specified in advance or in areas where additional value could be added by the private sector.
- There are currently a limited group of contractors in the market who have the expertise and resources to deliver the entire package. Further market testing should be carried out in advance of procurement.
- The employer has less flexibility to change requirements and maintain actual programme control. The contracts generally have limited flexibility to accelerate and any changes to requirements could entitle the contractor to extensions of time or to claim additional costs. This can be managed by ensuring a robust specification is developed through the pre-procurement phase.

C Metering and Billing

The key heat customers for the scheme have been identified as part of the technical feasibility study (see Customer Engagement section above). It may also be possible and advantageous to outsource metering and billing arrangements in respect of the heat supply agreements, particularly if a large number of domestic customers will ultimately be supplied. Where the number of customers is limited, as is the case at the outset of this project, the ESCO may be able to take on more of this role. Alternatively, metering and billing could be included in the DBOM contract arrangements. A competitive procurement would be run, if outsourcing is agreed, at the next stage of the process.

4.2.1 Potential for Risk Transfer

The main opportunities for risk transfer have been identified in the sections above and as part of the detailed risk assessments of the delivery and contracting structure. Each of the risk sections above set out the mitigation and management options for the identified risks. The overall position can be usefully summarised in this section.

The delivery structure adopted offers the Council a central role on the project through the use of a Council owned ESCO and a high degree of control to direct the project. When measured against the project objectives, a high degree of control is desirable to achieve the long-term aims of the project including future network expansion and the ability to retain project benefit in Bridgend. However, that structure and degree of control comes with some restriction in the ability to transfer project risks except through delivery contracts.

It is proposed that the majority of the delivery tasks for the project are outsourced and so the potential for risk transfer increases, particularly by using fixed price, fixed time delivery contracts and operations contracts with a robust availability and performance framework. As stated above regarding customer contracts, the Council will have the ability to link performance failures under the O&M contracts to service failures to customers to ensure a good degree of operational risk transfer.

Information on proposed investment partners, able to spread investment risk, are referred to in the financial case.

4.2.2 Plans for Managing Contracts

The Council has already identified the need to have dedicated project management resource allocated to the delivery of this project to manage the various project contracts through construction and thereafter throughout operations.

Resource planning will be included in the approval process for the Council's investment in the project. The need for a dedicated staff team is recognised as an essential resource to mitigate risks throughout the design and construction stages. It is anticipated this will be approved once the funding package is confirmed.

The overall programme for project delivery will be developed further once the timetable for the HNIP grant funding application is known. Currently, it is accepted that HNIP grant applications will be invited towards the end of 2018. Thereafter the procurement timelines identified in the procurement strategy above will be relevant. A final investment decision will be taken at the end of the procurement process once final costs are known before contracts are signed and construction commences.

The internal governance arrangements for implementation of the project are set out in the management case.

5.0 Financial Case

5.1 Introduction

This Financial Case examines the benefits and costs of the Project under a number of scenarios. The basis for calculating these benefits is a series of metrics, which result from the manner in which the Project is commercially structured and how it is funded. These include the Internal Rate of Return, Net Present Value and overall benefit to the investors in the Project.

Initially this section details the approaches and assumptions implemented in respect of the Financial Model. It sets out the base set of assumptions (the Base Case), the financial outputs of the Base Case, and a number of scenarios and sensitivities upon the Base Case. It also makes a comparison of cashflows under the Project as compared to the 'business as usual' or Counterfactual option from the customer's perspective to establish the financial benefits.

As identified in the Commercial Case, the preferred delivery option is a Council owned project delivered using a separate project vehicle (ESCO). The ESCO is established as a private company limited by shares 100% owned by the Council. The ESCO will procure the design, construction and operation of the heat network.

This section is structured under the following headings:

- Programme
- Approach to calculating the Financial Outputs
- Financial Model Assumptions
- Modelled scenarios and sensitivities
- Financial Results
- Investment Decision
- Financial Benefit to Consumers
- Heat Network Investment Programme
- Optimism Bias
- Accounting Treatment

To ensure compliance with the HNDU Business Case template, we have shown below how the headings above map to the template.

Table 11 Heading map against HNDU Template

Heading per HNDU Template	**Heading per this Financial Case**
Financial Resources & Budgets	Programme Approach to calculating the Financial Outputs Financial Model Assumptions Accounting Treatment
Budget Arrangements & Business Planning	Financial Results Investment Decision Financial Benefit to Consumers Heat Network Investment Programme
Financial Risk	Modelled scenarios and sensitivities Optimism Bias

5.2 Programme

Project cash flows have been considered over a period of 50 years from commencement of operation of the heat network. The Financial Model has the capability to assess the Project over a shorter or longer timeframe, if required.

The key elements to the Council's roll out of the heat network are identified below:

- The CHP asset is currently operated under an outsourcing contract with Greenwich Leisure Limited (GLL), which are then sub-contracted to Halo Leisure Limited (Halo).
- The Council would terminate the contract for the existing CHP, which is situated at the Bridgend Life Centre (BLC).
- The ESCO would install a CHP of greater capacity to meet the anticipated heat network demand
- The ESCO would adopt existing boiler capacity at BLC and supplement this with additional boiler capacity for the purposes of back up supply to the heat network
- The Bowls Centre (BC), Civic Centre Offices (CCO) and BLC (together the Public Sector Buildings) and RSL flats would all be connected to the heat network during the construction phase.
- The CCO would be connected to the CHP generators at the BLC via private wire. Any additional electricity generated beyond that demanded by the CCO and BLC would be exported to the grid.
- The heat network would be supplied by the new CHP unit and back-up boilers, which provide heat and electricity

5.3 Approach to calculating financial outputs

Based on the proposed network solution, and using the outputs of the TEM as the basis for its inputs, the Financial Model was developed to project cash flows and the relevant financial statements (income statement, balance sheet and cash flow statement) for the network.

The output of the TEM is the calculation of a Real Project Internal Rate of Return (excluding the impact of tax and financing on scenario financial performance). The outputs of the TEM include:

- Cash flows
- Energy flows
- Capital expenditure profiles
- Annual energy demands
- Gas/heat/electricity prices

These outputs have been exported from the TEM and entered as inputs into the Financial Model.

The purpose of the Financial Model is to give an indication of the financial viability of the Project using a set of assumptions about the costs (capital and operational) and revenues of the Project, including the impact of applying a commercial structure that includes tax and financing. Sensitivity analysis has also been undertaken on the preferred solution to explore the effects of changes to key assumptions within the Financial Model.

The Financial Model calculates various Internal Rate of Return (IRR) and Net Present Value (NPV) indicators to help understand the economic robustness of the Project and its likely attractiveness to different types of investors.

The Financial Model assesses the capital investment needed and the potential returns for investors, having incorporated the tax and any debt financing costs assumed for the relevant scenario.

The development of the TEM into a Financial Model has:

- Enabled the stress testing of key variables
- Allowed the review of different funding mechanisms for the ESCO prior to finalising this through Commercialisation

5.4 Financial Model Assumptions

This section details the assumptions used within the Financial Model.

5.4.1 Revenues

Revenues into the ESCO are made up of charges for heat and electricity (both sales through private wire, and to the grid).

The below are initial assumptions and will continue to be flexed and reviewed through the Commercialisation and Procurement phases as the Heads of Terms for the Heat Pricing are agreed with the customers.

Heat income

Heat networks typically charge for heat via a Fixed Charge plus a Variable Charge, similar to most electricity or gas supply contracts. A third method – a 'Flat Charge' approach is no longer allowed under the Heat Network (Metering and Billing) Regulations 2014, unless it is not technically possible and economically justified to implement metering and charging based on actual consumption.

Heat revenues within the Financial Model have been split into fixed and variable elements. The higher the element of Fixed Charge, the lower the demand risk, i.e. variability in income subject to demand.

The Financial Model assumes the following for the Base Case:

Heat: Fixed Charge

Heat prices have been set with respect to the cost of the counterfactual. The fixed cost component has been set to cover the costs which do not vary with the level of heat demanded:

- Annual maintenance cost; and
- Annualised Capital costs.

The Annualised Capital costs element of the fixed charge are based on the assumption that the existing boiler capacity in these buildings would be replaced with like for like plant every 20 years. The boiler capacities upon which these costs are based are taken from the TEM. Further investigation has highlighted that the boiler capacity required may be underestimated in the TEM. This is not expected to have a significant impact on the financial viability of the project but could potentially result in additional revenue from heat sales. This will be reviewed at the Final Business Case stage following procurement.

No discount to the sales price is applied to either the Public Sector Buildings or RSL flats in relation to the fixed charge.

Since the fixed charge is based on the counterfactual, customers are assured they will not pay any more in terms of fixed costs, than if they did not join the network. We note that an alternative approach would be to set the fixed charge to cover the ESCO's fixed costs (in tandem with matching variable charge against the ESCO's variable costs – see below).

Heat: Variable Charge

The variable charge has been set according to the variable costs of the counterfactual (i.e. gas cost and CCL). A variable charge for heat of 2.65p/kWh (for the Public Sector Buildings) and 2.88p/kWh (for the RSL flats) has been assumed in the Financial Model.

No discount has been applied to the counterfactual price for the Public Sector Buildings whereas a 5% discount has been applied to the RSL flats. These are indexed based on the BEIS Natural Gas Trend +RPIx rate over the life of the Project.

Since the variable charge is based on the counterfactual, customers are assured they will not pay any more in terms of variable costs, than if they did not join the network. We note that an alternative approach would be to set the variable charge to cover the ESCO's variable costs.

Connection Charges

A connection charge is a one-off contribution towards the capital cost of initiating a connection to the heat network. The connection charge could be designed to cover:

- The capital outlay required for connection to the Project;
- An amount not more than the cost which would be incurred for connection to/installation of an alternative heat source; and
- Planning Authority requirements

BCBC may wish to consider whether any of the potential customers to the Project would be willing to pay a connection charge, which may reduce the fixed/variable charges required over the life of the project.

For the purposes of the Financial Model, no connection charges have been assumed.

One potential approach to connections fees - that is understood to have been adopted in some Scandinavian DEN schemes – is that customers who sign up prior to operation are not charged (i.e. for early adopters and anchor load customers). Connection charges are then introduced for new customers when the network is operating.

Electricity income

The electricity generated by the CHP (which is not being used to support the CHP systems) can be sold via a Power Purchase Agreement (PPA). PPAs can be agreed with private wire customers or energy companies/ aggregators via the Grid. PPAs can be structured to have either a fixed or variable price and can be over a short or long period. A PPA offering lower but guaranteed revenues over the long term may be considered preferable to a shorter agreement that could potentially deliver higher but less certain revenues.

Power can be delivered to customers by private wire, a distribution network operated outside of the transmission and distribution licences. As a result, electricity can be sold from generator to a user via this network and without the need to be licenced and avoiding the constraints of transmission and distribution codes. The private wire arrangement requires an initial capital expenditure, but allows the realisation of higher income as a result of achieving an electricity sale price closer to a retail rate. Without the private wire, all of the electricity produced would have to be sold to Grid at the wholesale price, as agreed through the PPA.

The electricity price for private wire customers is based on the counterfactual price, less a discount of 10%. The electricity price has been calculated to be 10.385p/kWh. In calculating the final electricity price to customers, CCL is added to the discounted counterfactual price, to reflect what customers would pay if they did not connect to the network. This price is indexed using the BEIS Electricity trend + RPIx rate over the life of the Project.

Power can also be exported to Grid, which would usually be contracted via PPA with an energy supplier or aggregator. Power exported to Grid will be sold at a wholesale, as opposed to retail rate. The wholesale price to Grid has been assumed at £4.5p/kWh. This is over 50% lower than the assumed retail price and therefore sales to Grid will reduce revenue compared to sale over private wire.

There are a number of opportunities available to exploit peak demand periods and gain access to availability payments for generation capacity being available, including STOR and

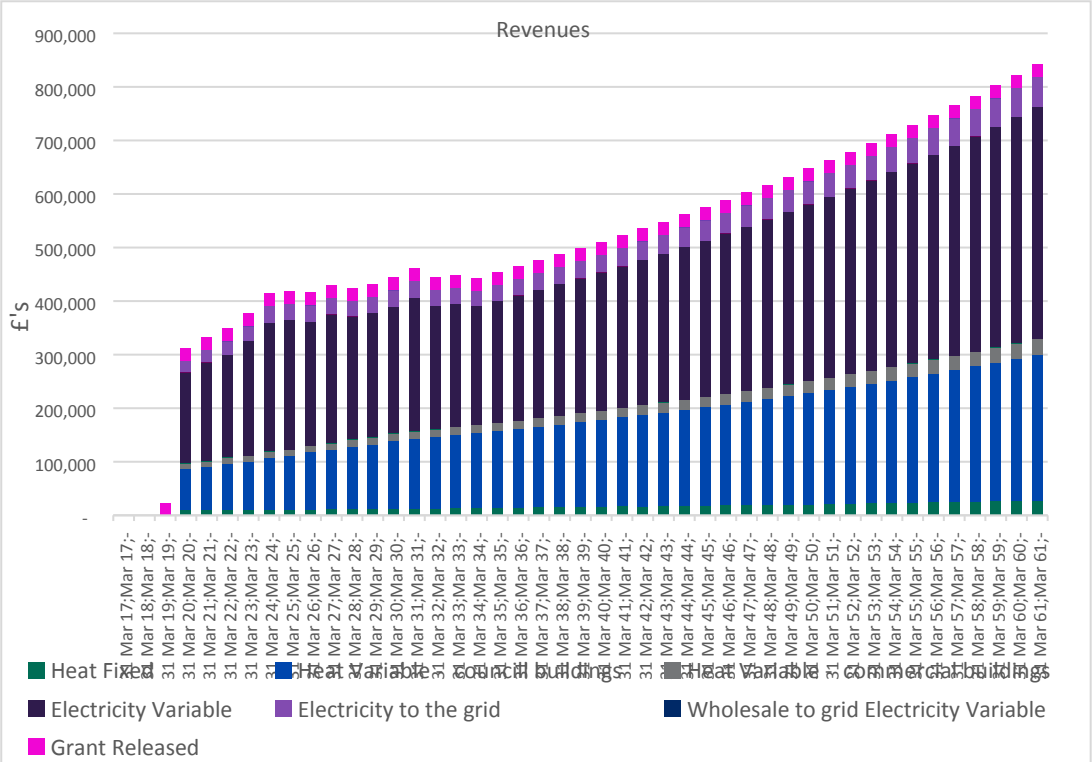
TRIADS as described below. These opportunities have not been included within the Financial Model due to uncertainties surrounding such revenues going forward.

Table 12 Electricity revenue opportunities

STOR (Short Term Operating Reserve)	At certain times of day, the National Grid needs reserve power in the form of either generation or demand reduction to be able to deal with actual demand being greater than forecast demand and/or plant unavailability. National Grid will procure part of this requirement ahead of time through STOR. A STOR provider must be able to offer a minimum of 3MW capacity. The amount of revenue available depends on the location of the capacity and the season during which it is available, however, such contracts can be worth in the region of £10,000 – £15,000 each year per MW of electricity generation capacity. Noting the 3MW capacity threshold, this revenues stream is not relevant at this stage of the Project but could be considered if the Project expanded at a later date.
TRIADS	TRIAD refers to the three half-hour periods of highest electricity demand between November and February. If exporting to the network during these periods, the local network operator will recompense the generator for reducing fees payable to National Grid. The amount paid depends on the local electricity network operator, and the contract with whomever buys the electricity, but historically it has been worth in the region of £25,000 - 30,000 each year per MW of electricity generation capacity. The TRIAD periods are determined in retrospect so it is not possible to know for certain when these periods will occur. It is therefore difficult to be certain that TRIAD income will be receivable and so we have not included this income in the modelling. Furthermore, it is understood that these payments are being reduced in value – over a three-year period from 2018 to 2020, from a value of around £45/kW to £2/kW.

The figure below shows the revenues for the Base Case in nominal terms. Approximately 40% relates to heat income and approximately 60% relates to electricity income. Note that in addition to the energy income, there is a revenue line for 'Grant Released', which reflects the accounting treatment to amortise grant received over the life of the project.

Figure 9 Revenues



5.4.2 Operating Costs (Opex)

The costs of operating the heat network are made up of both fixed and variable costs. The table below shows the build-up of operating costs (in nominal terms) over the life of the Project.

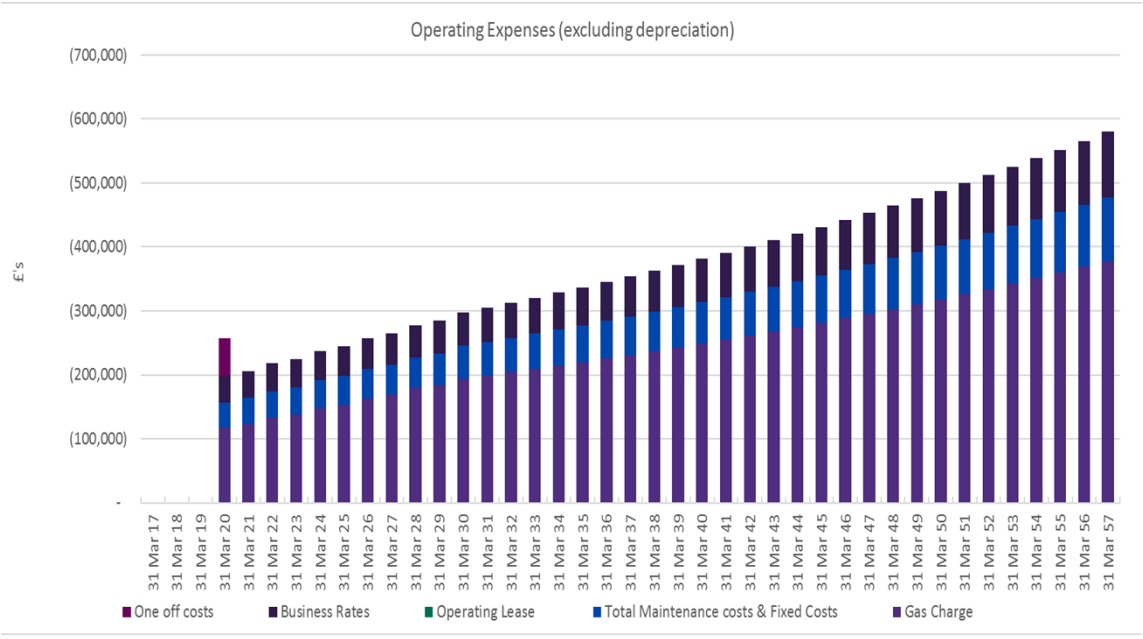
Table 13 Operating costs

Operating Cost	Total Nominal (£000s)	Assumptions
Gas consumption – Boilers & CHP	19,737	Gas is assumed to cost 1.704p/kWh (£17.04/MWh) indexed at the BEIS Gas Trend + RPIx. Gas used by the CHP is assumed to be exempt from Climate Change Levy (CCL) due to Good Quality CHP (GQCHP). It is also assumed that the top-up boiler gas is exempt from CCL under GQCHP rules.
Operating Lease	-	It is assumed the Council will lease land on which the Project is based, to the ESCO at a peppercorn rate of £1 per annum.
Maintenance costs	3,893	The maintenance profile is based on the assessed maintenance requirements of the capital equipment used in the components of the network, indexed at RPIx over the life of the Project.

Operating Cost	Total Nominal (£000s)	Assumptions
Business Rates	4,160	BEIS guidance calculates business rates on initial capital expenditure (less the cost of the CHP engine due to GQCHP) x 5% x 47.9% (as per Council's business rates team). The calculation is based on the initial capital expenditure of £1,899k less the allowable deduction of the £300k CHP engine resulting in an annual charge of £38.3kpa. This assumption should be further discussed with BCBC's business rates team to consider any further relief available to the Project.
One off cost	60	Breakage costs for the existing Halo CHP contract of £56k (unindexed). This figure has been provided for a breakage in 2017 and therefore may reduce year on year. No VAT charged on the breakage costs.
Total OPEX	**27,850**	

The chart below demonstrates the operating expenses incurred on an annual basis. Due to the inflation assumptions applied over the life of the Project, these can be seen to increase smoothly over time once the ESCO is fully operational. The higher charge in the first year of operations relates to the Halo breakage cost.

Figure 10 Operating Expenses



5.4.3 ESCO set up and on-going costs

BCBC has noted that the long-term aim of the ESCO is to deliver associated projects across Bridgend (e.g hospital scheme, mine water scheme etc). BCBC has therefore made the decision to exclude potential ESCO set up and ongoing costs from this Project, as they would be shared across a range of projects.

These excluded costs could be in the range of:

- Initial set up cost: £35k
- Annual costs:
    - Audit: £10k
    - Admin: £10k
    - Insurance: £15k

5.4.4 Capital costs

The following table shows the initial capital expenditure associated with the different aspects of the Project under the Base Case scenario, as provided by AECOM.

Table 14 Capex

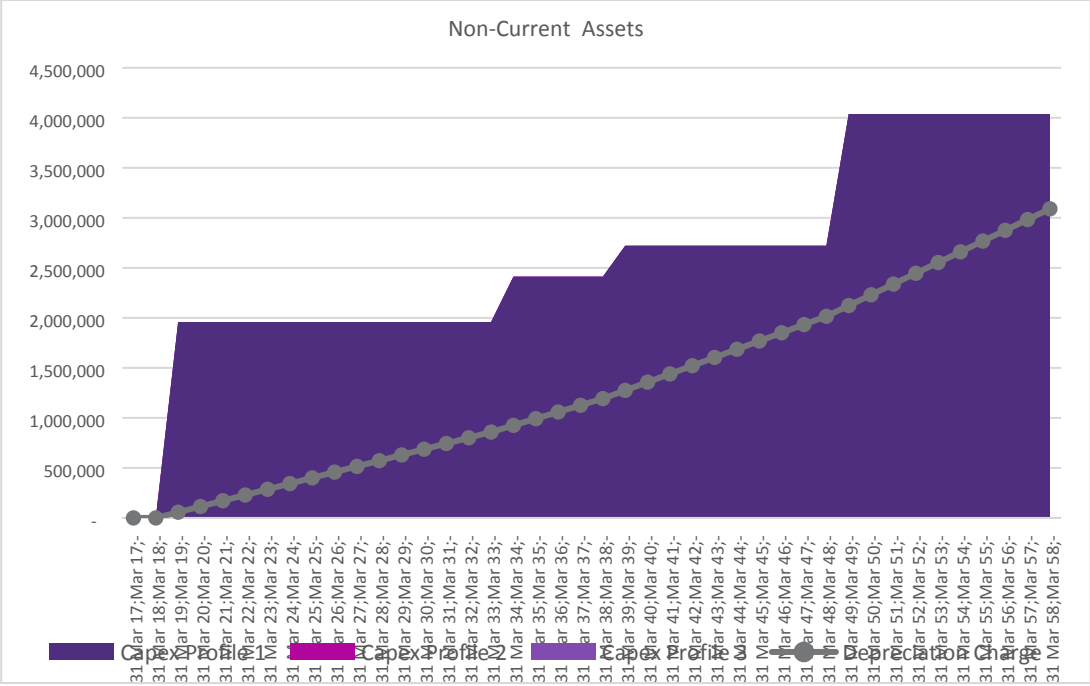
CAPEX	£
Thermal Generation	
CHP engine	300,000
Energy centre boilers	272,000
Thermal store	30,000
DH network capex installation costs	56,000
External service revisions	30,000
BWIC	212,850
Dems and Alts	65,000
Network Distribution	
DH network capex	418,400
Private wire to CCO	155,000
Gas connection	21,000
Electricity connection	136,000
Other	
Allowance for prelims, Contractor's contingencies and Overheads and profit	203,550
Total (Unindexed)	1,899,800

The £272k energy centre boiler costs shown in the table above reflect the capacity used in the Technical Feasibility Study. It is possible that the required boiler capacity may be underestimated. This is not expected to have a significant impact on the financial viability of the project. However, this will be further reviewed at the detailed design stage and responsibility for boiler capacity sizing in the energy centre will be passed to the design, build, operate and maintain (DBOM) contractor as part of any future procurement process.

In addition to the £1.9million initial capital expenditure noted above, capital replacements will be required over the 50 years of operation the CHP engine. As the CHP has a useful economic life of 15 years, it is expected to be replaced three times costing a further £0.9million (unindexed). It is possible that alternative low carbon heat sources (e.g. river source heat pump) will be adopted instead of gas fired CHP at the end of life of the initial gas fired CHP.

The figure below displays the capital expenditure profile for the Base Case. This graph shows when the capital expenditure is recognised as non-current (fixed) assets on the balance sheet, as well as the depreciation charge.

Figure 11 Non-current assets



5.4.5 Taxation

Corporation tax

Assumptions in relation to corporation tax are as follows:

- The Financial Model includes periodic tax calculations on taxable profits. As the Project entity is to be structured as an ESCO limited by shares with sales to non-members, it is assumed that corporation tax is applicable.
- The assumption has been made that the majority of capital expenditure (90%) will qualify for capital allowances, as we have seen on similar heat network projects. The Financial Model reflects a single pool with a main rate of 18%. As the Project develops through the Commercialisation phase, a more detailed view of the proposed capital expenditure should be undertaken, to confirm, for example, the eligibility of fixed assets for capital allowances and any special rates to be applied.
- No disallowed expenditure has been assumed in the Project cash flows. All transactions, including financing costs, have been assumed to be applied on an arm's-length basis.

Stamp Duty Land Tax

Stamp Duty Land Tax charges may be payable if property transactions occur as part of the Project. No such assumptions for transactions of this nature have been made, however this should be monitored further as the Project progresses.

VAT

Value Added Tax is assumed in the Financial Model on all income and expenditure flows at the standard rate of 20%. No assumptions around changes of VAT rates in future have been included. VAT on capital expenditure is considered to be VAT neutral in the month of construction i.e. it is paid and reclaimed in the same month and therefore does not form part of the funding drawdown requirements.

Given the stage of the Project, the Financial Model has been prepared on an annual basis. For this reason, VAT payments/repayments are assumed to occur in the same financial year in which the related financial expenditure/income occurred. For the Commercialisation phase of the Project, it is recommended that the Financial Model be developed further into a monthly model (for the construction phase), which will affect the timing of VAT cash flows.

Customers purchasing heat and electricity from the ESCO are assumed to be charged VAT at the standard rate of 20%. Recovery of that VAT will be dependent on each customer's VAT status.

Due to the complexities regarding the VAT status of entities involved and the recoverability of that input/output VAT, as the Project progresses into the Commercialisation phase, further specialist taxation advice will be required, to ensure developing areas around taxation are addressed appropriately.

5.4.6 Indexation

The TEM was developed on an 'unindexed' basis i.e. revenues and costs expressed in constant prices excluding the impact of real or general inflation.

The development of the TEM into the Financial Model includes applying assumptions around real and general inflation.

The HNIP application process prescribe BEIS forecasts for gas and electricity, so these are deemed the most appropriate indices in this respect.

The Financial Model uses a price base date of 1 April 2017.

The table below describes the indices used within the Financial Model.

Table 15 Indexation Assumptions

Index	Assumed to be	Applied to
RPIx	Based on Office for Budget Responsibilities Projections to 31 March 2022, then 2.5% after this date	- All items not specified below
BEIS Gas Trend	Variable based on Government Projections + RPIx	- Gas purchased from the grid - Variable heat price
BEIS Electricity Trend	Variable based on Government Projections + RPIx	- Electricity sold to the grid - Electricity sold via private wire

5.4.7 Discount Rate

In line with HMT Green Book, the NPV calculation uses discounting at a rate of 3.5% on real (unindexed) values to represent social time preference for years 1 to 30, and 3% thereafter. The discount rate is multiplied by the RPIx applied in a given year in order to calculate the discount rate for nominal values.

The discount rates are applied to calculate the NPV to consider the value of a Project over its life in present day terms. This is a best practice approach in assessing investment decisions in long-term projects.

5.4.8 Funding

Below we detail the funding structure assumed for the ESCO, which will need to be refined as the Project progresses through the Commercialisation and Procurement phases.

Equity

It is assumed that the ESCO is in the form of a company limited by shares, into which BCBC makes a pinpoint equity investment. Should other investors (e.g. Welsh Government) be identified, they could also invest pinpoint equity proportionate to the desired shareholding. The amount of such pinpoint equity reflects that it is not the primary capital funding source and is at sufficient levels required to incorporate the company. This is therefore an investment of £1 for BCBC. All dividends that arise from the ESCO will be paid out in proportion to the equity committed (i.e. 100% to BCBC).

Grant Funding

The most cost effective funding would be that which does not attract any interest. This may be through capital contributions (e.g. capital injections from the Project sponsor) or grant funding. Grant funds, which may be available to the Project, include HNDU development funding and HNIP (Heat Networks Investment Project) grant funding, albeit that will be subject to finalisation of how future HNIP funds are to be deployed.

Within the Base Case, it is assumed that HNIP grant funding based on 35% of the initial capital requirement is received (£0.665m).

Capital Injection

£500k is assumed to be available from BCBC as a capital injection.

Debt Funding

The capital requirements of the ESCO (not already met by share capital and grant funding) are assumed to be met through drawdowns of debt from BCBC. Where any cash deficit in the entity arises, this is met by an additional drawdown from BCBC.

Local authorities generally have access to borrowing at lower costs of finance than in the private sector, for example via the Public Works Loan Board (PWLB), Salix interest free loans, and internal resources. Where local authorities are lending into a Project, the interest rate must be on commercial terms otherwise, the discount against commercial terms would be considered aid under State Aid rules.

To calculate the rate which would be considered to be on commercial terms, reference was made to the European Commission Interest Base Rates[9]. At the date of preparation of the Financial Model, this interest rate was set at 0.65%. Then, via reference to State Aid requirements and exemptions[10] a margin of 400 basis points was applied – the minimum margin required for lending to an entity with no trading history and therefore considered to be higher risk (which would apply to the ESCO as a new company – regardless of the ultimate ownership of the ESCO). This sets a minimum interest rate for lending from a public sector entity to an arm's length ESCO of 4.65%.

This loan is repaid on an annuity basis over 50 years, subject to sufficient cash being generated to cover those repayments.

The Financial Model has been developed on an annual basis and no provision has been made for a working capital loan. During the Commercialisation Phase, a more detailed monthly Financial Model may indicate that a small working capital loan is required in the early periods of the Project.

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[9] http://ec.europa.eu/competition/state_aid/legislation/base_rates2017_09_en.pdf

[10] http://www.bigsocietycapital.com/sites/default/files/State%20Aid%20Information%20-%20January%202017.pdf

Once the ESCO has a proven trading record and/or assets which could be used as collateral against debt, refinancing could be explored. However, there is limited precedent in the market (in terms of sector and size of project) to suggest that this would be a likely option for this Project.

State Aid Considerations

The sum of the following constitute State Aid into the project:

- grant funding;
- capital injection; plus
- the difference between the interest charged to the ESCO by BCBC compared to that which would be charged using a commercial/arm's length rate.

Article 46 of the *General Block Exemption Regulation* (GBER) permits investment aid to be given for energy efficient district heating and cooling projects. Therefore an element of State Aid may be 'permissible/allowable' under this Article 46.

Permissible State Aid under Article 46 is considered and calculated in two parts:

Production Plant – the eligible costs for the production plant shall be the extra costs needed for the construction, expansion and refurbishment of one or more generation units to operate as an energy efficient district heating and cooling system compared to a conventional production plant. The investment shall be an integral part of the energy efficient district heating and cooling system. The aid intensity for the production plant shall not exceed 45% of the eligible costs. The aid intensity may be increased by 20 percentage points for aid granted to small undertaking and by 10 percentage points for aid granted to medium-sized undertaking. The aid intensity for the production plant may be increased by 15 percentage points for investments located in assisted areas fulfilling the conditions of Article 107 (3)(a) of the Treaty and by 5 percentage points for investments located in assisted areas fulfilling the conditions of Article 107 (3)(c) of the Treaty. We have calculated the 'allowable aid' percentage to be 60% based on the assumption the Project is within the West Wales and Valleys assisted area.

Distribution network – the eligible costs for the distribution network shall be the investment costs. The aid amount for the distribution network shall not exceed the difference between the eligible costs and the network operating profit (discounted). The operating profit shall be deducted from the eligible costs ex ante or through a claw-back mechanism. Allocating the Project operating profit between the supply of heat and the supply of electricity is open to interpretation. In particular, the CHP produces both heat and electricity. It is therefore difficult
to apportion the cost of generation of these outputs. The principal activity of the Project is the supply of heat and heat prices have been set at the cost of the counterfactual (boilers). The CHP generates less heat per unit of gas than a boiler (i.e. it is more expensive to generate heat via CHP), which suggests that the heat network element is not making a profit. This is further demonstrated through the understanding that if no electricity is sold, the Project would be running at a loss. In this way, the sale of electricity is a profitable by-product of generating heat via CHP. We have therefore used the working assumption that operating profit relates entirely to the electricity sales made under the Project.

The calculation of Allowable Aid is summarised in the table below.

Table 16 Allowable Aid

Element	Cost (£)	Comparator (£)	Difference (£)	Multiplier	Allowable Aid (£)
Production Plant	1,099,840	42,360	1,057,480	60%	634,488

Distribution Network	799,960	-	799,960	100%	799,960
Total	**1,899,800**				**1,434,448**

'Aid' (grant, capital injection and/or a soft loan) provided to the ESCO will be limited by State Aid rules. The Allowable Aid limit has been calculated in the table above at c£1.4m. Given the complexities around applying this guidance, it is recommended that further legal advice is sought if a bid for HNIP (or other funding) is made.

Summary of funding structure

The funding requirements and how these are assumed to be met in the Base Case (including the impact of RPIx) are shown in the table below. This takes into account not only loan drawdown requirements, but also grants received by the Project.

Table 17 Funding requirements

Funding source	Initial Capital	Capital refresh 2033	Capital refresh 2039	Capital refresh 2048	Capital refresh 2058	Capital refresh 2063	Total funding
Total Capital requirements	(1,958,694)	(453,218)	(309,032)	(1,317,167)	(506,386)	(950,656)	(5,495,153)
HNIP grant	664,930	-	-	-	-	-	664,930
BCBC capital injection	500,000	-	-	-	-	-	500,000
Loan drawdown	793,764			56,733			850,497
ESCO cash reserves	-	453,218	309,032	1,260,434	506,386	950,656	3,479,726

Only one additional drawdown is required by BCBC to fund the capital refreshes; the ESCO is able to build up sufficient cash reserves to finance all other capital refreshes under the Base Case.

The drawdown occurs in 2048 and includes the replacement of the energy centre boilers, CHP engine and thermal storage.

Note that the funding structure above does not maximise the Allowable Aid as calculated in the previous section. For reasons of prudence, this has been set at 35% capex (£665k) plus BCBC capital injection (£500k).

Alternative capital asset financing options

There are other options that may be considered as a means to fund the provision of assets. These are emerging areas for Heat Networks in England and Wales, however there is a growing indication that they may provide additional sources of finance to help meet the capital demands of the network. These are detailed below.

Lease Finance

Lease financing could be used as a method of acquiring the assets for the network without buying them outright. It is a type of lease in which a finance company (or other similar party) is typically the legal owner of the asset for the duration of the lease, while the lessee (in this instance the ESCO) has operating control of the asset, and therefore bears the risks and rewards of ownership.

Traditionally, lease finance has been available on assets that were movable – and could therefore be reclaimed by the financier in instances of non-payment. However, following discussion with BEIS, they have identified a number of potential investors that have

expressed an interest in providing lease finance to heat networks. While it would be unlikely that such investors would be willing to underwrite the capital spend of the entire network (particularly e.g. underground pipework and private wire), there is an argument that there may be investors willing to invest in the energy centres of the network. The key benefit of this arrangement would be to reduce the level of capital funding required for the ESCO.

The level of finance charge implicit within the lease would be subject to negotiation and would depend upon numerous factors (quantum of spend, length of lease, etc.). However, if such finance can be obtained at a level below the cost of funding being displaced, it could offer value to investors in terms of achievable returns and a reduction in the level of funding required in the network.

A reduced finance charge may be obtainable if the public sector investor is willing to underwrite the lease, recognising that such an arrangement would be subject to State Aid rules and assessment. If this option were explored further, in the first instance we would recommend seeking to understand what the charge may be with no such underwriting arrangements in place.

Tax efficient equity investment in pipework

This is still an emerging area at present. It is, however, something we understand is being actively explored by a number of potential investors. A number of wealth managers seek to achieve a return for their investors by investing in Projects that are not only able to provide a return on investment, but also qualify for tax relief.

One such scheme is HMRC's Enterprise Investment Scheme (EIS). This Scheme seeks to encourage investment in small higher risk trading companies that might otherwise struggle to receive finance (qualifying investments must be in new shares). The scheme allows individuals to invest up to £1m in a Project and claim 30% of the investment value against tax paid, thereby reducing their tax burden.

As a result of this, investing into a Project that qualifies for EIS provides an automatic 30% return on investment. The money invested is of course at risk and investors would be keen to understand their ability to recover the investment, however as there is an immediate gain the need for high Project returns is significantly reduced, the investor will merely need to consider the extent to which the Project can be refinanced and therefore the ability to extract the investment in a timely manner.

One limitation would be that EIS arrangements cannot be put in place where the investors benefit from other subsidy arrangements. Therefore if the Project moved to a low carbon heat source which attracted Renewable Heat Incentives (RHI) for instance, this double benefit would not be permissible.

Given the significant requirements around Projects being eligible for EIS relief, careful legal structuring is required which falls out of scope of this OBC and professional advice would need to be sought to make it more likely the eligibility can be agreed with HMRC. However, if this is something that the Council were keen to progress further; this would be something that would need to be developed through the Commercialisation phase.

5.5 Modelled Scenarios and sensitivities

Below we list the scenarios (including the Base Case) and sensitivities which have been run for the Project.

Table 18 Modelled scenarios and sensitivities

1	Base Case	Heat is sold to BLC, CCO and BC (Public Sector Buildings) with no discount against the counterfactual. Heat is sold to RSL flats with a 5% discount against the counterfactual.

		Electricity is sold to RSL flats, BLC and CCO at a 10% discount against the counterfactual. Business rates are payable by the ESCO. The ESCO is subject to corporation tax. A grant is received from Heat Networks Investment Project (HNIP) for 35% of the initial capital costs of the Project, being £665k. There is a £500k capital injection from BCBC. The funding gap is met by debt finance provided by BCBC, which is repaid through a 50 year annuity, which reflects the project length.
Project Structure Variation		
2	No Grant	As with Scenario 1, however the project receives no grant monies.
3	No business rates	As with Scenario 1, with no business rates. This is on the basis that the level of business rates is not yet determined and reliefs against the current assumption may be available to the ESCO – see 'Operating Costs' section. This scenario considers full business rate relief being available to the ESCO.
4	Charity Indication	As with Scenario 1, however the ESCO does not pay business rates or corporation tax. Note that this scenario is generated to provide an indication of the impact of setting up the ESCO as a charity. Should the Council wish to pursue this option, further detailed analysis would be required to determine the full impact. For example, there may also be irrecoverable VAT implications of moving to a charity structure.
Project length variation		
5	30 year Project length	As with Scenario 1, however the Project has an operating length of 30 years.
Financing and grant variations		
6	Base Case with revolving loan facility on public sector debt.	As with Scenario 1, however a revolving facility is assumed rather than a 50 year annuity on the public sector debt.
7	Base Case with maximised allowable grant funding	As with Scenario 1, however the maximum allowable Aid (under State Aid rules) is provided to the ESCO in the form of a grant.
Price variation		
8	Electricity tariff discount (+/-5%)	As with Scenario 1, with the discount applied to the electricity tariff varied as below:

		Scenario 8a – 15% electricity discount applied to counterfactual cost Scenario 8b – 5% electricity discount applied to counterfactual cost Scenario 8c – nil% electricity discount applied to counterfactual cost
9	Variables heat tariff discount	As with Scenario 1, with the discount applied to the variable heat tariff varied as below: Scenario 9a – All customers receive a 5% discount applied to the counterfactual cost Scenario 9b – All customers receive a 10% discount applied to the counterfactual cost
10	Capex (+/-5%)	As with Scenario 1, with capital expenditure varied by +/-5% Scenario 10a – 5% increase in capital expenditure Scenario 10b – 5% decrease in capital expenditure
11	Loan Interest Rate (+/- 50bp)	As with Scenario 1, with the loan interest rate varied +/- 50bp Scenario 11a – 50bp increase in the interest rate Scenario 11b – 50bp decrease in the interest rate

5.6 Financial Results

The tables in this section set out the outputs of the Base Case, alternative scenarios and sensitivities tested, using the following metrics:

- Project IRR – This is the nominal returns of the Project before the impact of Corporation Tax and financing
- Investor IRR – The Investor IRR is based on the total investment into the Project, being the funds provided by BCBC. Returns to the investor arise from interest on the loan, the repayment of the loan plus dividends
- Investor NPV – this is the net present value of the Project to BCBC as investor based on returns against equity and debt (i.e. does not include £500k capital injection)
- Investor Payback Period – this is the period of time required to reach a break-even point, based on returns against equity and debt (i.e. does not include £500k capital injection)

For comparison, BEIS have stated that IRRs for the portfolio of heat network Projects that are receiving support at the time of writing vary between 0% and 15%, with the majority sitting between 5% - 9%.

5.6.1 Base Case

The table below shows the results of the Base Case.

Table 19 Base Case

Scenario		Returns				Funding Structure of Initial Drawdown			Results		
		Project IRR	Investor IRR	Investor NPV £'s	Investor Payback Period	Loan at State Aid compliant rate	HNIP Grant £'s	BCBC Capital Injection	Dividends £'s	Cash at Project End	Project Viable
1	Base Case	2.71%	5.24%	(109,810)	21	793,764	664,930	500,000	(961,958)	0	Yes

The outputs of the Base Case show that the project is viable as it can repay its loans by the end of the 50 year project timeline. This Project is showing a low but positive Project IRR of 2.71%. As a result of the cash demands of the business, dividends to BCBC are not available until the Project end, after capital funding requirements and debt obligations have been met. This is reflected in the Investor IRR which is slightly higher (at 5.24%) than the loan rate (4.65%), which represents the return generated via the dividend.

5.6.2 Alternative scenarios

The 'alternative' scenarios are displayed in the table below, which reflect changes in funding structure, SPV type, and Project duration. These are considered separately to the sensitivities (i.e. +/-x% on variables) performed on the Base Case that are described in the next section.

Table 20 Scenarios

Scenario		Returns				Funding Structure of Initial Drawdown			Results		
		Project IRR	Investor IRR	Investor NPV £'s	Investor Payback Period	Loan at State Aid compliant rate	HNIP Grant £'s	BCBC Capital Injection	Dividends £'s	Cash at Project End	Project Viable
2	No Grant	2.71%	4.65%	(451,996)	25	1,958,694			-	(6,575,408)	No
3	No business rates	6.94%	6.43%	77,051	21	793,764	664,930	500,000	(4,429,376)	-	Yes
4	Charitable indication	6.94%	6.69%	138,594	21	793,764	664,930	500,000	(5,575,907)	-	Yes
5	30 Year Project period	0.32%	5.28%	(86,387)	18	793,764	664,930	500,000	(278,383)	-	Yes
6	Base Case with revolving loan facility on public sector debt.	2.71%	6.41%	23,101	9	793,764	664,930	500,000	(1,836,168)	-	Yes
7	Base Case with maximised allowable grant funding	2.71%	5.76%	(31,254)	21	558,694	900,000	500,000	(1,525,020)	-	Yes

Scenario 2: From the table above it can be seen that when no grant funding is available, the Project is not viable since the ESCO has a cash deficit £6,575k at the Project end. The ESCO is never able to repay the loan required to fund the initial capital expenditure, as it has to continually drawdown to make the loan repayments and operating requirements.

Scenario 3: Business rates account for 20% of the recurring costs in the ESCO. The investor IRR increases to 6.43% when they are not payable, highlighting the sensitivity of the model to business rates.

Scenario 4: This scenario provides an indication of the financial outputs if the ESCO is structured as a charity, which could provide exemption from both corporation tax and business rates. With no corporation tax or business rates due, the Investor IRR further increases to 6.69%. The main factor for this is the removal of business rates (see Scenario 3) as there is very little tax payable in the project due to low taxable profits. However, as previously stated there may also be irrecoverable VAT implications of moving to a charity structure.

Scenario 5: Under a 30 year Project period, the Project IRR drops by 2.39% from the Base Case Project IRR of 2.71%. The reason for this decrease in the investor IRR is that there is a capital re-fresh required in the final year of operations. A review of the useful economic life of the CHP could improve the economics of this scenario.

Scenario 6: This scenario evaluates the impact of a revolving loan facility. The Investor IRR has increased by 1.17% to 6.41%. The reason for the increased IRR is all surplus cash is used to repay debt as quickly as possible - the investment payback period is 9 years as opposed to 21 years in the Base Case. Due to the time value of money, quicker debt repayments offers a higher return to the investor.

Scenario 7: The maximum possible level of grant funding whilst remaining within the State Aid requirements is determined to be c.£1.4M. The impact of maximising this allowable aid (via additional £235k of grant monies) is evaluated in this scenario. The Investor IRR increases to 5.76%, which is due to lower financing costs enabling a larger dividend to be paid to BCBC at the end of operations.

5.6.3 Confirmation of the Preferred Solution

The Base Case (Scenario 1) is considered to represent the most likely option and it is shown to be viable due to generating enough cash to meet debt repayments and return a dividend to BCBC at the end of the project.

Although other scenarios may appear viable, each of these have their risks. These risks are been discussed below;

- No business rates - This an area in which we understand BEIS are developing further guidance. The outcome may confirm business rates are required.
- Charitable structure – Returns may be locked into the ESCO and therefore may not be able to be used to fund similar projects or passed onto the Council.
- 30 year project period – With a Project IRR 0.32%, the Project is only marginally viable.
- Revolving loan – There is the risk that BCBC's debt repayments to PWLB do not match the debt repayments from the ESCO which could lead to a cash shortfall.
- Additional Grant funding – There is the risk that additional grant funding is not available.

- We therefore take forward the Base Case (Option 1) for sensitivity testing, and to assess the financial benefits of this option for customers.

5.6.4 Sensitivity analysis

The table below reflects sensitivity scenarios performed on the Base Case. Each instance assesses a single point of change around one assumption in the model in order to assess the robustness of the Base Case to such changes.

Table 21 Sensitivity Analysis

Scenario		Returns				Funding Structure of Initial Drawdown			Results		
		Project IRR	Investor IRR	Investor NPV £'s	Investor Payback Period	Loan at State Aid compliant rate	HNIP Grant £'s	BCBC Capital Injection	Dividends £'s	Cash at Project End	Project Viable
8a	15% electricity discount applied to counterfactual price	1.33%	4.68%	(164,216)	21	793,764	664,930	500,000	(43,820)	-	Yes
8b	5% electricity discount applied to counterfactual price	3.83%	5.58%	(69,884)	21	793,764	664,930	500,000	(1,691,981)	-	Yes
8c	nil% electricity discount applied to counterfactual price	4.80%	5.84%	(32,155)	21	793,764	664,930	500,000	(2,394,881)	-	Yes
9a	All customers receive 5% discount on heat tariff	1.96%	4.94%	(140,601)	21	793,764	664,930	500,000	(439,419)	-	Yes
9b	All customers receive 10% discount on heat tariff	0.97%	4.65%	(167,505)	21	793,764	664,930	500,000	-	(183,252)	No
10a	5% increase in the cost of capital expenditure	2.17%	4.91%	(161,133)	21	891,698	664,930	500,000	(439,187)	-	Yes
10b	5% decrease in the cost of capital expenditure	3.25%	5.52%	(67,266)	21	695,829	664,930	500,000	(1,371,377)	-	Yes
11a	50bp increase in the interest rate	2.71%	5.55%	(68,895)	19	793,764	664,930	500,000	(759,562)	-	Yes
11b	50bp decrease in the interest rate	2.71%	4.94%	(150,344)	23	793,764	664,930	500,000	(1,133,188)	-	Yes

The Project remains viable in all sensitivities except for Scenario 9b, where there is a 10% discount on the heat tariff to all customers. The reduction in revenues to the project reduces the ability of the ESCO to repay its debt and has a cash deficit of £183k at the period end. This shows that the project is sensitive to reductions in heat revenues and therefore refinement of these assumptions will be important as the project progresses through to the Commercialisation phase.

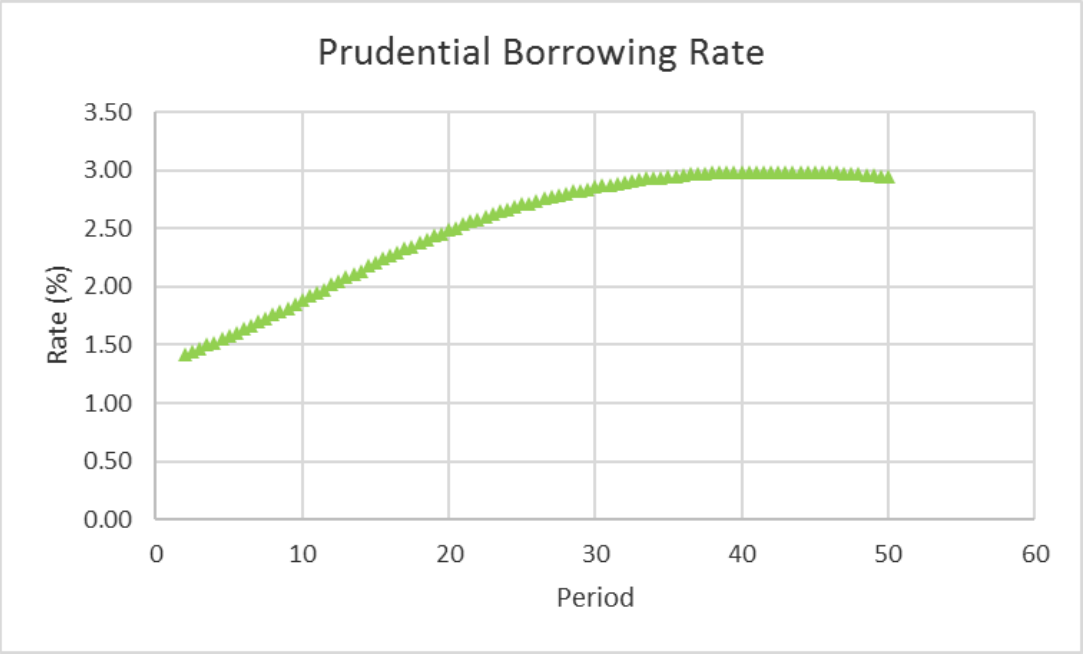
It can be seen from the table above that the project is also sensitive to reductions in electricity income. As for heat revenues, refinement of these assumptions will be important as the project progresses through to the Commercialisation phase.

5.7 Investment decision

When considering whether to invest in the Project, BCBC should compare its potential Investor IRR to the rate at which it can access capital. In the majority of instances, this would be from the PWLB. Note that this comparison would only consider the Project from an investor perspective and would not take into account potential energy cost savings.

The current prudential borrowing rates are as described in the graph below (based on access to a new PWLB Annuity), and range from 1.40% - 2.95%, depending on the period of borrowing. BCBC will need to determine its current level of Prudential Borrowing, and its limits on borrowing, in order to understand the scope for further borrowing. Borrowing rates for a 50-year annuity are in the region of 2.95%. This would indicate that BCBC could lend to the ESCO at a rate greater (say 4.65%) than its own cost of borrowing, which would generate a 'margin' (the difference between the two rates) as an income to BCBC.

Figure 12 Prudential borrowing rate



5.8 Financial Benefit to Consumers

In addition to Financial Modelling of the Project, we have also developed a consumer counterfactual. Comparing the cost to the consumer under the Project with the cost to the consumer under 'Business As Usual' allows a conclusion to be drawn on whether the project represents a financial benefit to each consumer.

This counterfactual calculates the cost to the consumer of the same heat and electricity demand as is assumed under the Project. The assumption is that all consumers would otherwise be generating heat from gas boilers. The cost of these boilers has been calculated (from the TEM) on an annualised basis, i.e. the capital cost is spread over the expected useful life of the boiler. Maintenance costs are also included. VAT has been assumed for all the businesses and buildings included in the proposed network. Indexation assumptions were applied on a basis consistent with the assumptions used in the Financial Model.

The cost of the counterfactual is then compared to the cost to customers of purchasing energy from the Project (i.e. including VAT) as well as recognising the cost/revenues related to funding the Project.

The cost to the consumer under the Project and the cost to the consumer under 'Business As Usual' (counterfactual) are then compared on an NPV basis in the table below.

Table 22 Public Sector Buildings Financial Benefit

Public Sector Buildings Financial Benefit	NPV £000s
Heat tariff	2,665
Electricity tariff	4,437
Capital injection	469
Total Cost	**7,571**
Margin on loan	235
Lease income	-
Dividends declared & paid	52
Business rates	879
Total Income	**1,166**
Cost to Public Sector Buildings under Heat Network (Net)	**6,405**
Boiler replacement costs	52
Boiler maintenance costs	187
Gas costs	2,280
Electricity	4,893
Cost to Public Sector Buildings under Business as Usual	**7,412**
Benefit for the Public Sector Buildings	**1,007**
Percentage benefit for Public Sector Buildings	**14%**

The table above shows a significant benefit to BCBC of developing the heat network of 14% (£1,007k) in NPV terms when comparing the cost under the heat network to the cost of business as usual. Discussions with Welsh Government as to whether or not BCBC would be able to retain business rates will be required to confirm this benefit. If business rates cannot be retained by the Council then the project benefit to the Public Sector will reduce to 2% (£128k). Given this sensitivity to business retention, further analysis will be undertaken through the Commercialisation phase.

The table below shows the financial benefit for RSL flats.

Table 23 RSL flats Financial Benefit

RSL flats Financial Benefit	NPV £000s
Heat Tariff	353
Cost to RSL flats under Heat Network	**353**
Boiler replacement costs	7
Boiler maintenance costs	23
Gas costs under	345
Heat cost to RSL under Business as Usual	**375**
Benefit for RSL	**22**
Percentage benefit for Council	**6%**

The financial benefit is marginal to RSL in NPV terms at 6% (£22k) when comparing the cost under the heat network to the cost of business as usual.

5.9 Heat Network Investment Programme (HNIP)

Through the Heat Networks Investment Project (HNIP), the UK Government has provided £320 million in grant and loan funding for heat networks to be allocated in the 5 years up to 2021. This section deals with the potential opportunity to access HNIP funding to offset part of the capital costs of delivering a heat network in Bridgend.

BCBC is looking to bid for a Heat Network Investment Programme (HNIP) grant for this Project. BEIS expect the main scheme to start receiving applications in autumn 2018 and allocate first year funding by March 2019.

The key financial criterion for bidding for these funds for new heat networks during the pilot phase was:

> *"… this [criteria] applies to Projects that cannot go ahead without support as the Project financials (such as Internal Rate of Return), whilst positive, are not attractive enough to secure funding. The **funding gap** in this case is the capital contribution required to take the IRR without HNIP funding up to the hurdle rate IRR of the equity investors. It is expected that applicants will have explored all other reasonable sources of funding prior to applying for the scheme and will be required to provide evidence to demonstrate this."*

On this basis, BCBC will need to demonstrate that the Project could not go ahead without HNIP support (through additionality tests) and that the application reflects a funding gap.

The table below demonstrates the Investor IRR under several 'aid' scenarios.

Table 24 'Aid' scenarios

Level of 'aid' under State Aid rules, being the sum of grant and capital injection	Investor IRR %	Improvement against No 'aid' Case %	Project Viable?	Comment
Nil	4.65%	N/A	No	Project is overdrawn at operation end by £6,575k
£500k capital injection	4.65%	nil	No	Project is overdrawn at operation end by £1,889k
Base Case (£665k grant, £500k capital injection)	5.24%	0.59%	Yes	
Maximum (£900k grant, £500k capital injection)	5.76%	1.11%	Yes	

The table demonstrates that the Project cannot go ahead without grant funding as there is not sufficient cash available to repay debt. Grant income reduces the need for debt finance in the early years of the Project, allowing cash that would otherwise have been used to service debt to build cash reserves (reducing the need for future drawdowns) and to make dividend payments.

In order to understand more fully the level of HNIP funding that may be available, the Council will need to consider its own Investor IRR hurdle rates that must be met for the Project to be considered a viable investment. Alongside the calculation of the maximum allowable aid (as set out in the 'State Aid Considerations' section), this will form part of the determination of the level of grant funding which can be applied for.

5.10 Optimism bias

In preparing an Outline Business Case, it is important to incorporate the impact of Optimism Bias, to help assess the level of uncertainty over Project costs. Optimism Bias reflects the demonstrated and systematic tendency for Project appraisers to be overly optimistic when considering Project benefits and costs.

Key areas to consider relating to Optimism Bias are:

- Capital Expenditure Optimism Bias
- Operating Expenditure and Revenues Optimism Bias
- Confirmation of the Preferred Solution decision

To address this tendency, it is important to make explicit adjustments and thus determine a suitably optimism bias-adjusted outcome. These adjustments will have the effect of increasing the cost estimates, decreasing the projected benefits and extending the timescales over which

the costs and benefits are assumed to accrue, compared to the initial unadjusted estimates for each option.

The principles in Annex 4 of the Green Book and in the HMT supplementary guidance should be applied with proportionate effort in a manner that suits the circumstances. Wherever possible, the relevant adjustments should reflect local experience in preference to use of the HMT generic figures. They should be based on data from past Projects or similar Projects elsewhere, and adjusted for the unique characteristics of the Project in hand. When such information is not available, it is encouraged to collect data to inform estimates of optimism, and in the meantime use the best available data.

It is important to be satisfied that the adjustments made are realistic and justifiable in relation to local experience. They should represent a meaningful effort to improve the quality of assumptions rather than arbitrary percentage adjustments.

Consideration of Optimism Bias to date has been based on the sensitivity testing performed to demonstrate the robustness of the Project to these variables. Similarly, the base data prepared through the TEM by AECOM is based upon the collection of local data and a deep understanding of heat networks to reduce the impact of optimism bias upon the Project. For example, in respect of potential customers to the network, optimism bias has been reduced through the use of real heat and energy demand data made available by engaged stakeholders, resulting in a 'core' network rather than an expanded network that would have more customers but could be seen to be more optimistic and speculative.

As is demonstrated by the sensitivity testing the Project returns have stayed acceptable at the following sensitivity levels:

- 5% discount to all customers on the heat sales price
- Variants on electricity sales price discounts
- Capital expenditure (+/-5%)
- Interest Rates (+/- 50bp)

5.11 Accounting Treatment

The preferred commercial option represents an ESCO, with the shares owned 100% by BCBC. It is therefore a public sector controlled subsidiary.

Subsidiary companies are defined as organisations that the Shareholder controls by having power over the organisation, exposure or rights to variable returns from its investment and the ability to use its power over the organisation to affect the amount of the return.

As a subsidiary company, the financial results of the ESCO will be consolidated in to the financial results of BCBC. BCBC's Group Accounts should show the results of the ESCO, thus showing the full extent of BCBC's economic activities by reflecting the Council's involvement with its group companies and organisations.

In BCBC's single-entity accounts its interest in those companies included in its group accounts are recorded as financial assets at cost less any impairment.

6.0 Management Case

6.1 Key short and long term milestones: High level plan

The section below summarises the actions across a range of key areas which are being taken to demonstrate the achievability of the project.

Interdependencies with other projects and/or business areas
The implementation of the project is highly dependent upon agreement being reached between BCBC and GLL/Halo to the modification of the existing Healthy Living Management Agreement. To develop the principles upon which the modification will be based, the following approach is being adopted:

- Regular liaison with the BCBC Leisure Contract Manager to identify areas requiring clarification.
- Repeated contact with the GLL Energy & Environment Manager and the Halo Partnership Manager to agree in principle:
    - How the interface will work in physical terms in the Life Centre Plant room.
    - The equipment/plant that will remain the responsibility of GLL/Halo and what will transfer to the ESco.
    - The charging mechanism for Halo/GLL for heat & electricity from the ESCo.
    - Benchmarking of current energy costs and recharges paid by Halo to BCBC.

Detailed Commercialisation and Delivery Phases
Prior to the award of a Design, Build, Operate and Maintain (DBOM) contract a procurement exercise needs to be completed that will require specialist technical, legal and financial support. The cost for providing this support is estimated at £120,000.

It is anticipated that a funding bid will be made to UK Government HNDU in January 2018 to secure part funding (67%) for this piece of work. The remaining 33% match (£39,600) will need to be provided by BCBC.

The project requires that a Special Purpose Vehicle (SPV) is created to deliver the project. Specialist legal support will be required to do this. The cost of this has been estimated as £35,000. Attempts will be made to secure support for this again from the HNDU support funding (£23,450) with the remainder of the funding being provided by BCBC (£11,550).

Delivery Phases
The project will be delivered in a single phase following the award of a design, build, operate and maintain contract in May 2019.
The Strategic Case discusses future phase expansion opportunities that could potentially happen in the future.

Fall back arrangements should the project fail to deliver
The continuation of the BCBC service delivery and public access to Leisure Services is dependent on effective heating being provided to the buildings for part of the core scheme. Hence, from BCBC's perspective the project can not be allowed to fail. A number of steps are being taken in order to guard against this possibility including:

- Guaranteeing that BCBC is adequately represented on the board of the ESCO.
- Requiring the ESCO to let a single design, build, operate and maintain (DBOM) contract for the project, thereby ensuring interface risks between construction and operation are eliminated.
- Ensuring there are step in rights for BCBC in the event that the ESCO becomes untenable.

Mitigation actions for sustainability impacts
Ensuring the project delivers its sustainability goals is vital to BCBC and other stakeholders, including Welsh Government. Hence the following actions are planned to manage these risks:

- Writing clauses into the DBOM contract to ensure that the full carbon saving potential of the plant is realised.
- Require a review of future alternative heat sources to be undertaken after 5 years of operation.
- Preparation of a heat source transition plan for the network after 10 years detailing what technology will replace the gas CHP unit at the end of its operational life.

Evidence collection and Quality Assurance activity
At certain stages key decision/approval points will depend on new evidence being produced. The table below highlights for particular decisions what key data will be collected, together with the associated timeline and how performance, evaluation and benefits evidence will be collected.

Table 25 Key data and timelines for key decisions

Decision	**Key Data**	**Timeline**	**Method for collection of performance, evaluation and benefits evidence.**
Apply for HNIP Capital Funding	OBC including Strategic, Economic, Commercial, Financial and Management cases	Autumn 2018	Preparation of OBC making use of previous technical feasibility work.
Begin DBOM Procurement	Development of Invitation to Tender (ITT) based on technical, financial and legal advice	March 2018	Appointment of advisors to advise on technical, financial and legal aspects of ITT
Setting up SPV	Legal advice on required arrangements related to SPV e.g. articles of association, etc.	September 2018	Legal advice from company appointed to advise on scheme.
Appointment of DBOM contractor for the project	Informed by ITT and submitted tenders.	May 2019	Advice from appointed legal, financial and technical advisors.

6.2 Stakeholder management and communications

The initial phase of Bridgend Town Heat Network project has a relatively small number of stakeholders with BCBC and GLL/Halo being the key players. The table below lists the high level stakeholders and their expectations for the project. It also summarises arrangements for obtaining up to date information on their perspective of the project.

Table 26 The role and expectations of different organisations

Organisation	**Role**	**Expectations**	**Refreshing information**
Bridgend County Borough Council	Project Instigator Investor Heat customer	A successful heat network, capable of expansion, is developed to meet the local authority's	Chair monthly Operations Group. Representatives from different departments on board e.g. Leisure,

		economic and environmental objectives.	Property, Finance, Communities
Welsh Government	Grant Provider	The project helps to achieve WG's objectives for decarbonisation.	Represented on the monthly project Operations Group
Greenwich Leisure Limited / Halo	Heat Customer	Heat costs are less than, and at the least no higher.	One-to-one meetings involving Council external advisors as necessary
Linc Cymru	Heat Customer	Heat costs are less than, and at the least no higher, than from alternative and heat network connection has the ability to ensure residents don't suffer from fuel poverty. Carbon emissions are lower than from gas boilers.	One-to-one meetings.

The individual stakeholder meetings listed in the table above will be the primary mechanism for disseminating information to stakeholders. However, regular communication will also take place through email and telephone discussions. Feedback from stakeholders will be passed back through internal communication channels to senior management and prioritised as necessary in relation to its importance.

6.2.1 Customers

The initial customers for the project will be BCBC buildings, albeit with two of them operated by a third party, and a registered social landlord developing in the area. However, other public sector organisations with buildings in the area and private sector owned buildings will also be able to connect to the network from a very early stage.

Heat customers will benefit from reduced heat costs on a whole life cost basis.

Individual meetings with the key stakeholders for the project have taken place to explain the plan for the project, the potential benefits and progress in developing the network plans.

6.3 Project governance

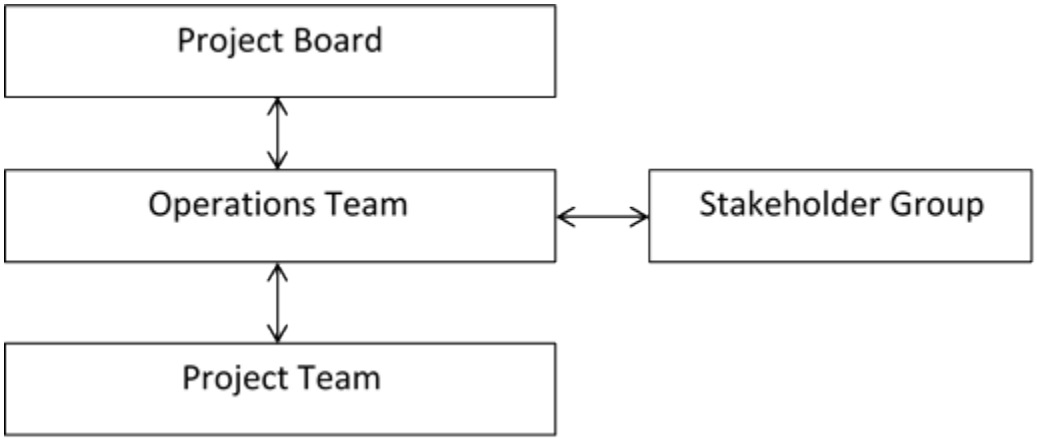
6.3.1 Governance arrangements

The section below summarises the proposed governance arrangements to demonstrate that the appropriate bodies, roles and processes are in place. It describes how the whole governance structure works, including lines of reporting, authority and accountability, maintenance of management information, quality assurance measures, and the involvement of key stakeholders

The development of the OBC, including all support technical, financial and commercial advice, has been overseen by the Bridgend Town Heat Network Operations Team. This was formulated in 2017 and has met on a regular basis.
The Governance arrangements for the commercialisation phase of the network are shown in the figure below and build on those adopted for the development of the project OBC. It is

envisaged that these arrangements will evolve further once the SPV is established and the single DBOM contract achieves financial closure.

Figure 13 Governance arrangements



Project Board

The network has the potential to become an important project for the Council and is a key element in the wider low carbon strategy. The implementation of the Bridgend Town Heat Network will be overseen by a Project Board. The Project Board will provide the strategic leadership for the project and provide overall oversight of the project delivery.
It is proposed that the Board will consist of the following members:

- Director of Communities, Bridgend County Borough Council (Chairman)
- Head of Finance, Bridgend County Borough Council
- SPV Project Director
- Head of ESD Capital, Decarbonisation and Energy, Welsh Government

It is intended that the Project Board will meeting quarterly, but the frequency of meetings will be reviewed at the first meeting.

Full Terms of Reference for the board will be presented at the first meeting of the board for discussion. However, in order to meet its responsibilities, it is envisaged that the Project Board will:

- Receive written and verbal briefings from the Operations Team
- Accept or reject recommendations made by the Operations Team
- Approve or reject the project proceeding to procurement, based on a recommendation from the Operations Team.
- Make recommendations to BCBC Cabinet regarding:
    - Proceeding with a Capital Grant application.
    - Proceeding with procurement of the project.
    - Setting up a Special Purpose Vehicle to deliver the project.

- Appointment of a design, build, operate and maintain contractor
- Proceeding with a HNIP grant application.

Operations Team

The Operations Team will provide the Project Board with the information and briefings required for it to make recommendations to the BCBC cabinet regarding the different stages of project implementation.
It is proposed that the Operations Team will consist of the following members:

- Team Leader Sustainable Development, Bridgend County Borough Council
- The Bridgend Town Heat Network Project Manager, BCBC
- Group Manager – Sports and Physical Activity, BCBC
- Principal Surveyor Property Services, BCBC
- Governance and Compliance Officer, BCBC
- Energy and Environment Manager, Greenwich Leisure Limited
- Partnership Manager, Halo Leisure
- Project Director, Local Partnerships
- Specialists procured to provide specialist advice to the project where required.

It is intended that the Operations Team will meeting monthly, or as agreed by the Operations Team.

During the implementation phase, the key responsibility of the Operations Team will be to agree the principles of contract variation required for the BCBC and GLL/Halo contract. Specific activities will include:

- How the interface will work in physical terms in the Life Centre Plant room.
- The equipment/plant that will remain the responsibility of GLL/Halo and what will transfer to the ESco.
- The charging mechanism for Halo/GLL for heat & electricity from the ESCo.
- Benchmarking of current energy costs and recharges paid by Halo to BCBC and reflecting these in the economic and financial cases.

Project Team

An Implementation Project Team will be established within Council. This Project Team will collate information and prepare briefings to ensure that relevant parties are aware of items that need resolution.
It is proposed that the Project Team will consist of the following members:

- The Bridgend Town Heat Network Project Manager, BCBC
- Team Leader Sustainable Development, Bridgend County Borough Council
- Group Manager – Sports and Physical Activity, BCBC
- Manager Skills and Sustainable Development
- Governance and Compliance Officer

It is intended that the Project Team will meet weekly, or as agreed by the Project Team. The team will review project progress and prioritise actions for the following week. The team will bring in specialist expertise as necessary to provide detailed advice on particular project requirements.

The project team will:

- Develop an application for capital grant funding;
- Develop the necessary tender documentation to appoint the necessary specialist support needed to establish the delivery vehicle;
- Ensure the procurement documentation for the design, build, operate and maintain (DBOM) contract is developed, making use of specialist external support where necessary;
- Maintaining relationships with key stakeholders;

Stakeholder Group

Additionally, a Stakeholder Group will be established to include representatives from other organisations with an interest in the development of the Bridgend Town Heat Network project. Organisations represented may include other potential heat customers, community interest groups, etc. It is envisaged that this group will meet as and when the need arises.

6.3.2 Project organisation & resources – team members, roles & capability

Non-executive Director

A non-executive director will be appointed to the board of the SPV to oversee the commercialisation phase of the project. This appointment will be made after the creation of the SPV in September 2018.

The Non-executive Director will:

- Provide commercial experience of operating an energy business.
- Fulfill a mentoring role for SPV staff.

The Non-executive Director will provide:

- Commercial advice for BCBC prior to the appointment of the DBOM contractor
- Attendance at relevant meetings
- Advice upon DBOM contract management
- Support to the director to develop the strategy of the business.
- A monitoring of business performance and scrutiny of the performance of management against agreed objectives and targets service.
- Verification of the accuracy and integrity of financial information.
- A validation of the risk management systems, controls and processes that are in place to manage the operation.

Project Director

A project director will be appointed to lead the SPV and manage the operation of the DBOM contract with the private sector delivery partner.
The Project Director will:

- Lead the SPV and provide strategic direction.
- Provide the link between the SPV and BCBC through the Project Board.

The Project Director will be accountable for:

- Maintaining the performance of the SPV in line with its agreed objectives and targets.

- Attending the Project Board meetings
- Briefing members of the Board around specific issues.

Project Manager
A dedicated, full time project manager, located within BCBC's Communities Directorate, will be appointed to manage the delivery of the project.
The Heat Network Project Manager will:

- Set an agenda for and chair each team meeting;
- Update the team on progress against plan;
- Identify risks and issues arising which could affect progress; and
- Issue a list of actions arising from the meeting.

The Project Manager will be accountable for:

- Procuring the specialist legal, financial and technical support necessary for delivery of the project;
- Coordinating the specialist support to develop the invitation to Tender (ITT) documentation for the Design, Build, Operate and Maintain (DBMO) contract.
- Developing the capital grant application to HNIP
- Putting in place the conditions to allow the SPV to be formulated.

6.3.3 Assurance & approvals

The table below sets out the approval steps required for implementation of the project, together with the associated timeline.

Table 27 Timetable for assurance and approval milestone

Assurance/Approval Milestone (e.g.)	Completion / Planned Date
Cabinet Member Briefing	December 2017
Draft Outline Business Case Report	December 2017
Informal Cabinet Briefing	December 2017
Comments including legal and financial comments	December 2017
Final Outline Business Case	December 2017
Cabinet Report issued with OBC attached	December 2017
Cabinet Further Investment Decision to Proceed	January 2018
Apply for Capital Grant Funding	October 2018
Set Up Special Purpose Vehicle	September 2018
Apply for HNIP grant funding	November 2018
Award DBMO Contract	May 2019

6.4 Risk management

An up-to-date risk register will be maintained by the project manager to ensure risks are identified and effective mitigation measures are put in place.

As part of the governance arrangements set out about, the risk register will be regularly presented to the Operations Team, and significant risks presented at the monthly project board.

The performance of the project will also be regularly reported in relation to the risks identified in the risk appetite statement (see strategic case section 2.3) and any deviation from the anticipated performance promptly reported.