

Negative Risks that offer a threat to the expansion of Bristol heat networks and its Aims (Aim - Reduce Level of Risk)

Ref	Risk Description	Key Causes	Key Consequence	Status Open / Closed	Risk Category	Risk Owner	Key Mitigations	Direction of travel	Current Risk Level			Monetary Impact of Risk £k	Risk Tolerance			
									Likelihood	Impact	Risk Rating		Likelihood	Impact	Risk Rating	Date
1	New developments do not connect to the Bristol Heat network	Conditions not set out during planning stage, design of buildings unsatisfactory and uncompetitive comparative costs.	Without buildings connected, the financial viability of the network is significantly impacted.	Open	Financial	BCC	New developments are required to connect to the Heat network as part of planning conditions. BCC Energy Services has established a strong working relationship with developers to ensure buy in from the developer community. A connection pack and standard legal documentation is also now complete and being used to provide developers with early information on what they are required to do to connect to the heat network	Reducing	2	5	10	3-5m	2	3	6	
2	Existing buildings are not district heating ready.	Lack of future proofing of plant room equipment within existing buildings	High return temperatures can significantly impact on the performance of networks, particularly for the Old Market network served by WSHP. Heating system upgrades may be required for existing buildings, to ensure lower network return temperatures.	Open	Financial	BCC	The Old Market phase 1 network consists of mostly planned developments and newly constructed sites that are likely to operate on lower secondary side temperatures. Secondary side heating systems have not been surveyed in detail as part of this study and costs for secondary side improvements have not been confirmed. Specific building return temperatures for existing sites should be further assessed at feasibility stage, once plant rooms and building surveys have been undertaken and costs for secondary side improvements considered where required.	Reducing	4	3	12	0.5-3m	3	3	9	
3	Increased project costs and/or reduced financial returns.	Underestimation of capital costs due to lack of feasibility work and due diligence.	Project capital costs could increase as the heat network scheme is designed in detail, resulting in a reduced financially viable scheme(s). Other external factors such as energy prices reducing further or borrowing costs increasing could also reduce the project's financial returns.	Open	Financial	BCC	BCC will carry out further detailed design studies where required to ensure capital costs are as accurate as possible prior to installation. BCC have appointed external consultants to carry out outline and detailed feasibilities of heat networks that include techno economic models that can test the implications of higher capital costs on the financial returns BCC will be applying for government (BEIS) HNIP grant funding to increase the financial return and/or security of the financial returns	No change	2	3	6	0.5-3m	2	3	6	
4	Project delays occur	The installation and ultimate installation and operation of the scheme could be delayed due to a number of factors including: <ul style="list-style-type: none"> • Negotiating and signing of contracts • Procurement of detailed design and/or appointing consultants • Procurement of physical works and procurement of contractors • Drafting and signing of agreements between organisations (commercial agreements and energy supply contracts) • Installation of the network 	Delays in project programmes could lead to financial loss and risk of being unable to supply heat to buildings within agreed timescales.	Open	Financial	BCC	The delivery timescales are partly linked to the developer 'heat on' requirements. Priority is given to networks where a heat on date is required for new developments. The Council's Energy Service is also investigating temporary and interim energy centre options, that could supply a new development with heat if required prior to the heat network being completed.	Reducing	2	3	6	0.5-3m	3	2	6	

5	Exposure to UK Government changes in low-carbon subsidies and taxes	Changes to Government policy and/or priorities.	Government changes in taxation/subsidies could reduce the financial viability of Bristol's heat networks.	Open	Programme/ Project Management	BCC	If HNIP grant funding was no longer available, BCC may have to scale back its heat network proposals in the short term. However, HNIP is in place for at least 1-3 years and heat networks have been identified as a key method for decarbonising heat in urban areas. Furthermore, the UK has signed up to reduce its carbon emissions as part of the Paris agreement.	No change	3	3	9	0.5-3m	3	3	9
6	Planning Policies on heat network connection are not enforced.	Lack of engagement with planning department internally and backing from senior BCC members.	Planning policy requirements for new developments to connect to Bristol's heat networks is crucial to their development. If these policies are not enforced the heat network is less likely to deliver a lower carbon city.	Open	Programme/ Project Management	BCC	BCC Energy Service has consulted planners and is currently producing a simplified guide to heat networks for planning officers which could be rolled out to planning committee members	Reducing	3	3	9	0.5-3m	2	3	6
7	Not securing suitable energy centre locations	Issues regarding securing suitable locations. Lack of engagement with property and owners of potentially viable locations.	Networks are reliant on sufficient space for energy generation being available, causing limited energy supply near key heat loads. Number of heat loads that can be supplied by network is related to space available for generation capacity.	Open	Programme/ Project Management	BCC	Various discussions have been held to identify potential space available for energy centres. Further internal BCC liaison will be required to ensure authorisation for energy centres at currently identified sites.	Reducing	2	5	10	3-5m	1	5	5
8	Government grant funding (HNIP) or Renewable Heat Incentive (RHI) (for the Water Source Heat pumps) applications are not successful	RHI - Delays in installation or commissioning of the water source heat pump solution HNIP - Grant application does not meet BEIS criteria	Significant impact on the financial returns to BCC	Open	Financial	BCC	RHI - Prioritise installation of the water source heat pump solution above networks with less reliance on receiving RHI income HNIP - Engagement with BEIS to ensure grant applications meet funding criteria	Reducing	3	5	15	0.5-3m	2	5	10
9	whilst Gas CHP provides a low carbon solution in the short term, it provides limited long term carbon reduction benefits when BEIS carbon emissions forecasts are applied.	The long-term carbon savings provided by gas CHP reduce over time, using current marginal carbon intensity forecasts (figures for the carbon intensity of the grid generation that is likely to be displaced by future gas CHP installations).	Networks served by gas CHP are likely to provide carbon reduction benefits in the short term only.	Open	Environmental	BCC	Networks served by gas CHP are likely to be economically viable enabling networks to be brought forward. Future connection of these networks to a single Bristol Heat Network and Strategic Heat Main, to supply low carbon heat from Avonmouth, has been considered for all network options. There may also be opportunities in the short – medium term to limit the operation of the CHP plant to times when the carbon intensity of the grid is high, resulting in increased CO2e savings.	Reducing	4	5	20	0.5-3m	4	3	12
10	Air quality restrictions and considerations may restrict gas CHP and biomass options.	The energy centre locations for all prioritised network areas are within Air Quality Management Area's.	Emissions from gas CHP and auxiliary gas boilers will need to be considered.	Open	Environmental	BCC	CAPEX evaluations within feasibility studies include costs for ultra-low NOx emission gas boilers and selective catalytic reduction (SCR) technology for gas CHP units to minimise emissions from energy centres. BCC air quality staff have been consulted and their advice considered. Following confirmation of the final energy centre and technology sizing at the feasibility stage, emissions dispersion model, air quality impact and flue height assessment can be carried out at the detailed project development stage if required.	Reducing	4	4	16		3	4	12

11	Insufficient abstraction volume to supply the heat pump capacity required.	If the permitted abstraction volume for WSHPs available in the Floating Harbour is insufficient to supply the heat pump capacity required for the priority networks.	If the WSHP options are not viable this will significantly impact the extent to which BCC carbon reduction priorities are met.	Open	Financial Environmental	BCC	High-level assessments of available heat resource has been undertaken, to determine approximate WSHP capacities. These will be further assessed at feasibility stage and, if taken forward, at detailed design stage to accurately determine potential water temperatures and flow rates. The Environment Agency and Harbour Master have been consulted and both have no objections to the heat pump abstraction and locations in principle (a full application will be required)	Reducing	3	5	15	0.5-3m	2	5	10
12	Potential network connections may be made up of multiple buildings with numerous decentralised plant rooms that may increase project CAPEX and network losses.	Multiple plant rooms can increase network length and significantly increase project CAPEX and network losses.	The viability of the network will be compromised.	Open	Financial	BCC	The investigations have looked at where sites include multiple plant rooms, the network may need to be split between the primary networks and smaller secondary networks (buried, above ground or internal to buildings) that connect between a substation and groups of smaller buildings, e.g. Bristol Hippodrome has multiple gas boilers within a single building that may require connection to a single heating system if the site was to connect to a network.	No change	4	5	12	0.5-3m	4	5	12
13	Physical barriers to installing pipework	The presence of a high density of utilities along Barton Road, crossing major roads such as Temple Way Underpass (A4044) and St Augustine's Parade (A38) and infrastructure constraints including College Street viaduct and a wall separating Deanery Road and Lower Lamb Street. Areas of archaeological sensitivity create major barriers including city and castle walls. There are limited diversion opportunities within Bristol, and closing certain roads may be unacceptable.	Could prevent the implementation of scheme or lead to CAPEX increase and viability issues.	Open	Environmental Financial Programme/ Project Management	BCC	As part of the feasibility and design work, the main physical barriers, issues and constraints within the study area have been considered and, where possible, avoided during the network prioritisation process. GIS layers and utility maps have been reviewed and a route walkover at key points conducted. As the project progresses, further liaison will be required with local highways, structures, archaeology and planning departments and utility companies.	Reducing	4	5	20	3-5m	3	4	12
14	Onerous legal, commercial and contractual arrangements particularly relating to electricity sales and potential purchase of distribution networks assets.	The contractual arrangements for the sale of electricity can be complex and will require significant engagement and negotiation with potential customers and Western Power Distribution.	The implementation of private wire could become too arduous.	Open	Financial	BCC	The extent of any private wire network has been limited. The private wire network for the City Centre network supplies a single connection (UoB ring main) 3 connections for the St Paul's Network. There may also be an opportunity for the City Centre network's gas CHP to supply electricity to the Old Market network's WSHP via a private wire or sleeving arrangement, eliminating the requirement for a private wire connection to the UoB ring main.	Reducing	3	4	12	0.5-3m	2	4	8
15	The planned SHN, or other long-term network developments do not integrate effectively with existing network areas.	A long-term low carbon energy source of sufficient capacity is required to continue expanding energy networks and reducing city CO2e emissions and meet BCC's targets for CO2e reduction.	Could result in diminishing CO2e reductions.	Open	Environmental	BCC	Futureproofing has been considered to enable networks to connect to a city-wide network via a City Ring Main and the SHN in the long term.	Reducing	3	2	6	Under 0.5k	2	2	4

16	Capital costs are significantly higher than estimated.	The lack of economic assessment to include robust project CAPEX, the likely financial benefits or sufficient information to secure funding.	Higher capital costs can have a significant impact on the viability of all network phases potentially causing the network plan to not progress.	Open	Financial	BCC	All project costs established within previous studies have been based on a combination of previous project experience and recent quotes for similar projects. The consultant team have a large database of the actual costs of installing district energy schemes including costs for equipment supply and installation, distribution pipework supply and installation, trench excavation and re-instatement. Sensitivity analysis has also been undertaken for network options to show the effect of a variance in capital costs and contingency has been applied to all CAPEX items.	Reducing	4	5	20	0.5-3m	3	4	12
17	Variation in heat sales tariffs	Insufficient or inadequate investigation into the financial affects of changes to variable heat sale tariffs.	Variation in heat sales tariffs have a significant impact on the viability of all network options.	Open	Financial	BCC	Baseline tariffs within financial modelling has been based on a 5 % reduction on the current cost of heat to end users. Tariff calculations have included current gas tariffs (standing charge and unit rate), boiler efficiency and maintenance and replacement costs. Sensitivity analysis has been undertaken to show the effect of heat sale tariff variation.	Reducing	3	3	9	0.5-3m	2	3	6
18	Projects are likely to require grant funding.	Some options are unlikely to be financially viable without grant funding. This is due to network pipes and energy centres being oversized for the demand of connected buildings, to enable the network to be futureproofed for later phases.	Projects will not be viable and have a gap in funding.	Open	Financial	BCC	HNIP provides support with the expectation of additionality and ensuring that early phases are futureproofed for expansion may qualify for support under this condition. HNIP support could potentially be applied for to contribute to the cost of developing secondary networks if multiple plant rooms are identified at key sites. Grant funding analysis has been undertaken as part of feasibility work.	Reducing	3	3	9	0.5-3m	2	3	6
19	Variation in gas and electricity import tariffs significantly affects financial viability.	Insufficient or inadequate investigation into the financial affects of changes to variations in gas and electricity import tariffs.	Variation in gas and electricity import tariffs have a significant impact on the viability of network options.	Open	Financial	BCC	Current assumptions regarding Import tariffs have been based on current tariffs known for key buildings. Sensitivity analysis has also been undertaken to show the effect of gas and electricity import tariff variations.	Reducing	3	3	9	0.5-3m	2	3	6
20	Senior management does not fully support the scheme and / or the scheme is not linked to corporate priorities.	Lack of support from senior management or different priorities.	There is a risk senior management will not fully support the project. If this is the case, then the whole project viability could be affected.	Open	Service Provision Programme/ Project Management	BCC	At present, senior management within BCC are appraised of project progress and are fully supportive. Meetings and presentations have been delivered to agree the objectives for the project and align them to corporate priorities. Further stakeholder engagement will be needed in the next phases of projects.	Reducing	3	5	15	3-5m	2	5	10
21	Planned developments are brought forward prior to network development.	Developers may install alternative heating systems within planned developments if DHNs are not in place prior to construction.	Infrastructure may not be in place to connect in time. Temporary boilers may be required to serve planned developments until networks are brought forward.	Open	Service Provision Programme/ Project Management	BCC	Network phases have been assessed based on information currently available on timing of planned developments. This should be reassessed as networks are progressed and more information on planned developments becomes available. Free Tank and Dings Park have been identified as potential temporary energy centre locations to serve planned developments along Avon Street prior to connection to the WSHP at Castle Park Depot (reliant on crossing the A4044).	Reducing	3	3	9	0.5-3m	2	3	6