

Heat Networks Delivery Approach Revenue Business Case

Briefing Paper



I. EXECUTIVE SUMMARY

This business case relates to the expansion of low carbon heat network infrastructure on a zonal scale to achieve the City's commitments to carbon reduction, but also achieve a range of other outcomes including improvements in air quality, energy security, mitigate fuel poverty, green investment, jobs and skills.

Plymouth City Council was selected by the Department of Energy Security & Net Zero (DESNZ) as one of 28 cities to be part of the government's Heat Network Zoning Pilot Programme and subsequently, Plymouth was shortlisted under DESNZ's 'Advanced Zoning Programme' (AZP). Through these programmes, the Council has benefited from significant government investment and support to move towards delivery of zonal heat networks for the city. Heat networks provide the cheapest low carbon energy source available, utilising and distributing waste heat that is already available as a by-product of certain processes.

The initial phase of the heat network could generate savings of 11,000tCO₂ per annum. With roll out this could be more than 30,000tCO₂ per annum.

Cabinet endorsed the zonal approach to heat network roll out in Plymouth on 9th September 2024, including using a PCC led procurement and an application to the Governments' Green Heat Network Fund grant programme. This was also supported by Natural Infrastructure and Growth Scrutiny Panel on 29th October 2024.

On 9th September 2024, Cabinet also granted delegated authority to the Service Director for Strategic Planning & Infrastructure, in consultation with Cabinet Member for Environment & Climate Change, to determine the following matters in respect to the heat network delivery project:

- (a) Approval of revenue business case;
- (b) Procurement of development partner;
- (c) Submission of an application to the Green Heat Network Fund to support the delivery of the first phase of the project; and
- (d) Any other matter to secure delivery of the project, subject to such being within approved budget.

This report seeks approval for procurement of a heat network development partner, on the basis of a Golden Share delivery model, the submission of an application for grant funding towards the first phase of development to the Green Heat Network Fund.

It also sets out a number of subsidiary PCC and land matters intended to create certainty for the procurement, which, subject to commercial terms being acceptable, PCC could subsequently agree to, when a Development Partner has been selected.

Revenue costs which PCC will need to cover to support (alongside Government DESNZ funding) are estimated to be £164k, including for procurement, developing a communications and engagement strategy, entering into a Pre-emptive Agreement for land, legal costs and strategic advice. Funding has already been identified to cover this, from S106 contributions (Crescent Point) £64k, BEIS £68k and EU HeatNet £32k, all of which is specifically ring-fenced for heat networks and cannot be used for any other purpose. These are currently considered to be sufficient to cover the support needed up to the appointment of a development partner. The risk of any additional revenue costs being identified over

and above this is considered to be very unlikely, and should this arise, would need to be secured from other agreed sources such as DESNZ or from the SP&I budget, by prior agreement from the Service Director for SP&I and Finance.

There are a number of key risks. These include failure to attract a private sector partner, although it is considered that this is relatively low, a risk of not securing grant funding, as a competitive process, although the application will closely reflect the grant criteria and those schemes recently awarded. The risk of lack of commitment by potential heat network customers has and can be mitigated by ongoing engagement to ensure they are supportive and fully understand the benefits.

2. THE CURRENT SITUATION

Heat represents the biggest energy use in the UK, accounts for 46% of all the energy used, and around 30% of UK carbon emissions. 90% of these heat related emissions are from burning gas. Providing heating and hot water to buildings constitutes **28% of Plymouths carbon emissions**. To reach Net Zero by 2050, Climate Change Committee sets out that the sector needs to be almost completely decarbonised. It is however, one of the hardest sectors to decarbonise, due to the variety of building stock, different ownerships and extent of engagement required.

To date progress to decarbonise this sector this has been very slow indeed. 'Plymouth's greenhouse gas reporting and sector emissions monitoring and projections 2022' (University of Exeter) estimates that to achieve Net Zero 72,000 heat pump installations are needed by 2030 (as one of the primary technologies) – which requires the installation of an additional 8,977 heat pumps annually. To date EPCs data suggests the installation of only 180 heat pumps in Plymouth to 2022.

Climate Change Committee, in its Sixth Carbon Budget sets out different pathways to Net Zero, all of which show Heat Networks contributing to 20% of overall heat demand by 2050 and 42% of non-domestic properties. As well as driving the decarbonisation of heat, they also highlight other benefits, including improved energy security and improved air quality.

Heat networks can provide space heating, hot water and cooling, and are considered to be a key infrastructure for decarbonising heat, as they can access and utilise larger scale sources of waste and renewable heat, offering a clean and low-carbon supply at competitive prices to businesses and households. Waste heat is by far the cheapest source of heat but also decouples supply of heat from some of the volatility of energy prices, associated with fossil fuels. Conservative estimates suggest that industrial waste heat could cover at least 25% of district heating generation. In Sweden 45% of all heat used in heat networks came from sources of waste heat in 2018. Figure 1 provides an illustration of what a heat network is.

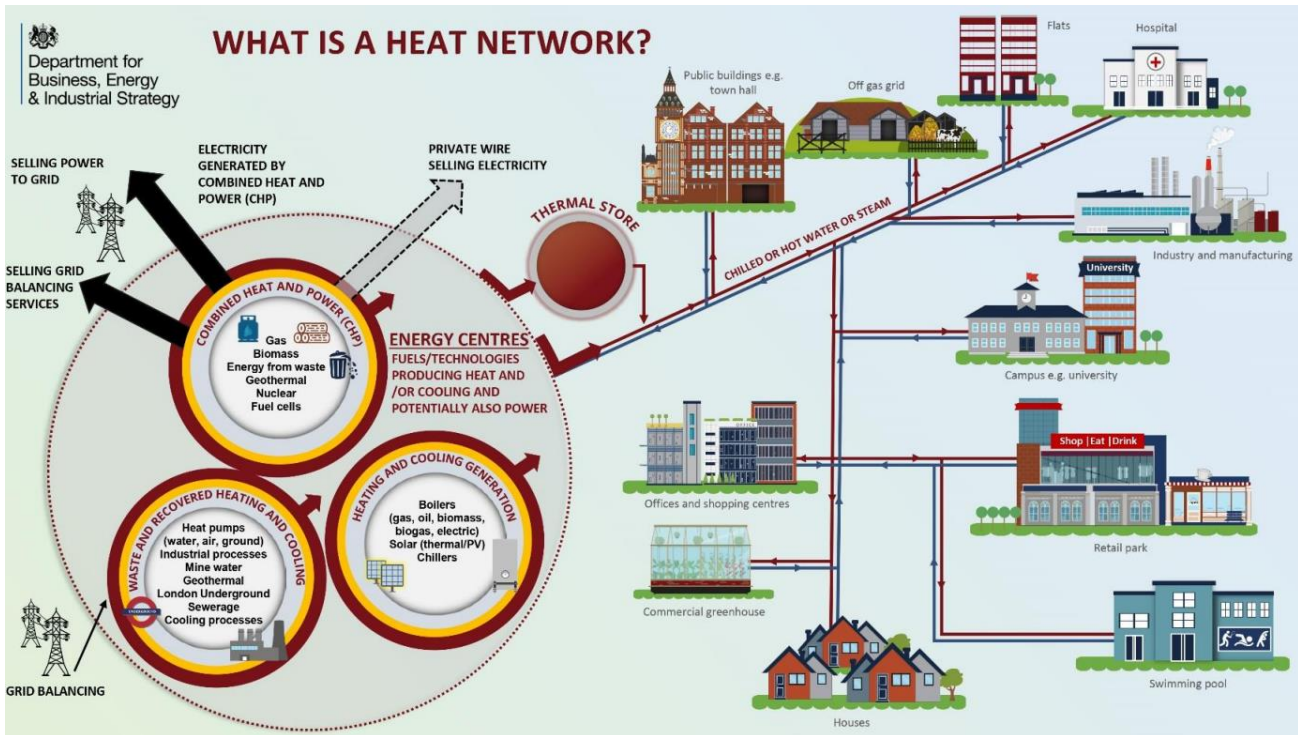


Figure 1. 'What is a Heat Network' illustration

Heat networks provide an opportunity to accelerate progress significantly by providing an 'at scale' approach, utilising waste heat that will otherwise only contribute further to global warming. As well as decarbonisation, benefits include improved air quality, mitigation of fuel poverty, resilience of supply and generation of green skills and jobs.

Many buildings are expensive or difficult to retrofit with a low carbon heat source in isolation. Studies have shown that approaches to decarbonisation in higher density urban areas, using district energy networks with heat pumps can involve lower capital and operational costs than individual heat pumps.

Plymouth City Council has been developing the conditions and opportunity for a city-wide network for a number of years including through its Plymouth and South West Devon Joint Local Plan (March 2019) which requires developments to connect, or be able to connect, to a heat network, if within a 'district energy opportunity area', but also by installing enabling infrastructure in Millbay Boulevard, decarbonising its small existing heat network at the Guildhall, developing a catalyst scheme around Civic Centre and future-proofing its Ballard House for connection.

Nationally, the Department for Energy Security and Net Zero (DESNZ) are enabling the development of heat network infrastructure through a range of targeted funding, policy and legislative support to de-risk projects and attract investment.

In October 2023, the Energy Act received Royal Assent. The Act gives powers for the Government to develop legislation around zoning and regulation of heat networks. The Government has already consulted on the Heat Network Zoning legislation and suggested this should be in place early in 2025. Ofgem have been appointed as regulator.

Heat network zoning will be designated by Government, on the basis of heat demand density, using a national model. Heat networks are expected to be the lowest cost solution for decarbonising heat in these areas. Local authorities and heat network developers will be able to quickly identify where new heat networks should be built, but also there will be requirements for certain buildings to connect. Local authorities will be consulted on the zones and invited to oversee management of zones, as Zone Coordinators, along with the Central Authority (central government) overseeing the zoning nationally. The recent consultation of heat network zoning suggests that resources will be made available to Local Authorities to fulfil this statutory role. Should Local Authorities not wish to carry out this role, then it is likely this would be carried out by the Central Authority.

PCC were initially part of the Department of Energy Security & Net Zero (DESNZ) Heat Network Zoning Pilot Programme. This pilot identified two preliminary zones, one being the city centre and another being in Derriford to the North of the City.

Following this initial study, Plymouth was shortlisted by DESNZ through its Advanced Zoning Programme (AZP) along with 16 other cities (total of 19 locations). Plymouth AZP studies show a deliverable scheme that spans the City Centre to Devonport and Barne Barton with capital value of approximately £300m. Derriford is also recognised within the HNZ Pilot Programme as an opportunity area (an additional £50m). The Plymouth waterfront zonal opportunity is based principally around two large waste heat sources: the South West Water Central Plant, and the MVV Energy from Waste plant. At Derriford, the scheme is focused on waste heat from the NHS medical waste incinerator, together with expanding the existing ground source scheme at Marjons University to provide heating and cooling across this area.

The AZP approach is intended to enable the construction of new zonal scale heat networks as quickly as possible following the introduction of heat network zoning legislation. The work being undertaken by AZP will avoid a lag in activity between policy coming into effect and the deployment of heat network development in zones. In addition to supporting cities in the initiation of the first heat network project within the zone, AZP is also helping cities to define the strategic delivery plan for the overall zone.

On 25th October 2024, the Department of Energy Security & Net Zero announced that Plymouth had been further shortlisted as one of 6 towns and cities which will be supported further, to move to delivery and will become the first heat network zones.

3. CORPORATE POLICY ALIGNMENT

Delivery of heat networks has been identified in every **Climate Emergency Action Plan** and **Net Zero Action Plan** (NZAP) between 2020 and 2024, including:

- Submitting funding applications to support development and delivery of heat network
- Feasibility studies and testing for different heat sources
- Delivering heat network cluster around Civic Centre
- Participation in government's Heat Network Zoning pilot.

The NZAP 2024-27 includes the latest action commitment:

- Develop a strategic heat network delivery programme for the city, including the city centre/waterfront and Derriford areas, including the procurement of a delivery partner, aided through participation in the Government's Advanced Zoning Programme.

The Plymouth and South West Devon Joint Local Plan (March 2019) requires developments to connect, or be able to connect, to a heat network, if within a 'district energy opportunity area'. As a result, many developments in the City Centre and other areas, have already been designed to be ready to connect to a heat network.

The Plymouth Plan Policy GRO7 specifically sets out 'promoting the creation of infrastructure to supply low carbon heat through the delivery and expansion of district energy networks'.

The Plymouth Economic Strategy 2024 targets inward investment and growth activity from businesses linked to Net Zero opportunities, including specifically heat networks.

Additionally, the **Corporate Plan** identifies green investment, jobs and skills as a corporate priority. Social value will form an important part of the procurement objectives including addressing fuel poverty, jobs and skills training.

4. THE PROPOSAL

The City Council has been working with the Department of Energy Security & Net Zero (DESNZ) as part of the Heat Network Zoning Pilot Programme (28 cities). This pilot has identified two preliminary zones as shown in Figure 2 (please note these are pilot zones and subject to final policy approval).

Plymouth was shortlisted by DESNZ through its Advanced Zoning Programme (AZP) along with 16 other cities. Plymouth AZP studies show a deliverable scheme in west and south of City with capital value of approximately £300m, and also at Derriford (an additional £50m). The southern area is based principally around two large waste heat sources; the South West Water Central Plant, and the Devonport Energy from Waste plant. At Derriford the scheme is focused around waste heat from the NHS medical waste incinerator, together with expanding the existing ground source scheme at Plymouth Marjon University to provide heating and cooling across this area.

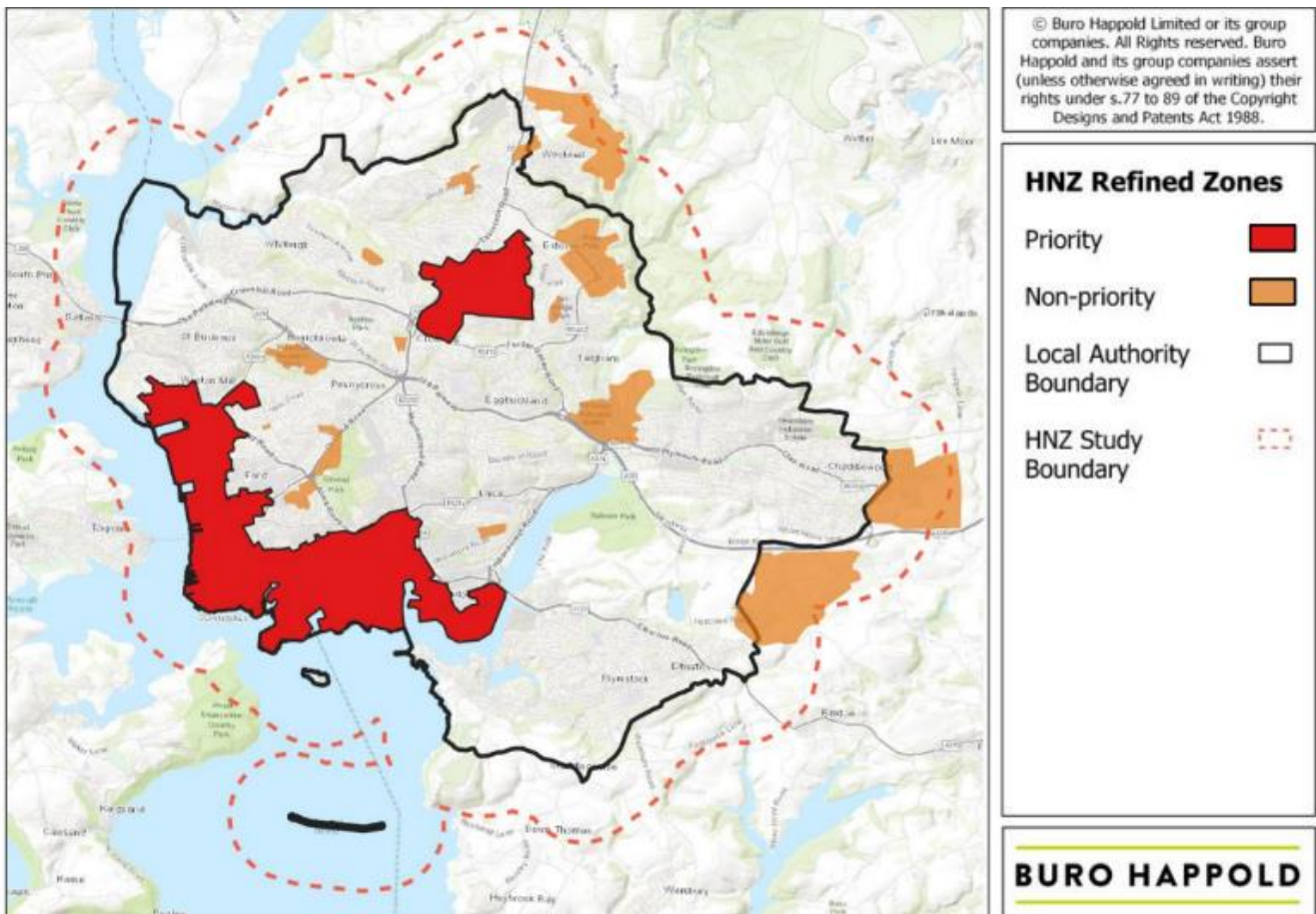


Figure 2. Two potential Heat Network Zones in Plymouth

Annual carbon savings with significant build out for both zones have been estimated to be **31,000tCO₂**, which represents over 3% of the current city emissions but we would expect the carbon savings to be higher as this network is expanded and to be in excess of 5%. Figure 3 shows a potential strategic heat network across the southern waterfront zone alone, with estimated carbon savings of 26,000tCO₂/ annum. This is therefore an intervention with significant impact in the journey to a net zero city. Additionally, the strategic heat network creates significant opportunities for

creating new pathways in the city for green jobs and skills, which is one of the Plymouth Economic Strategy's key areas of focus.

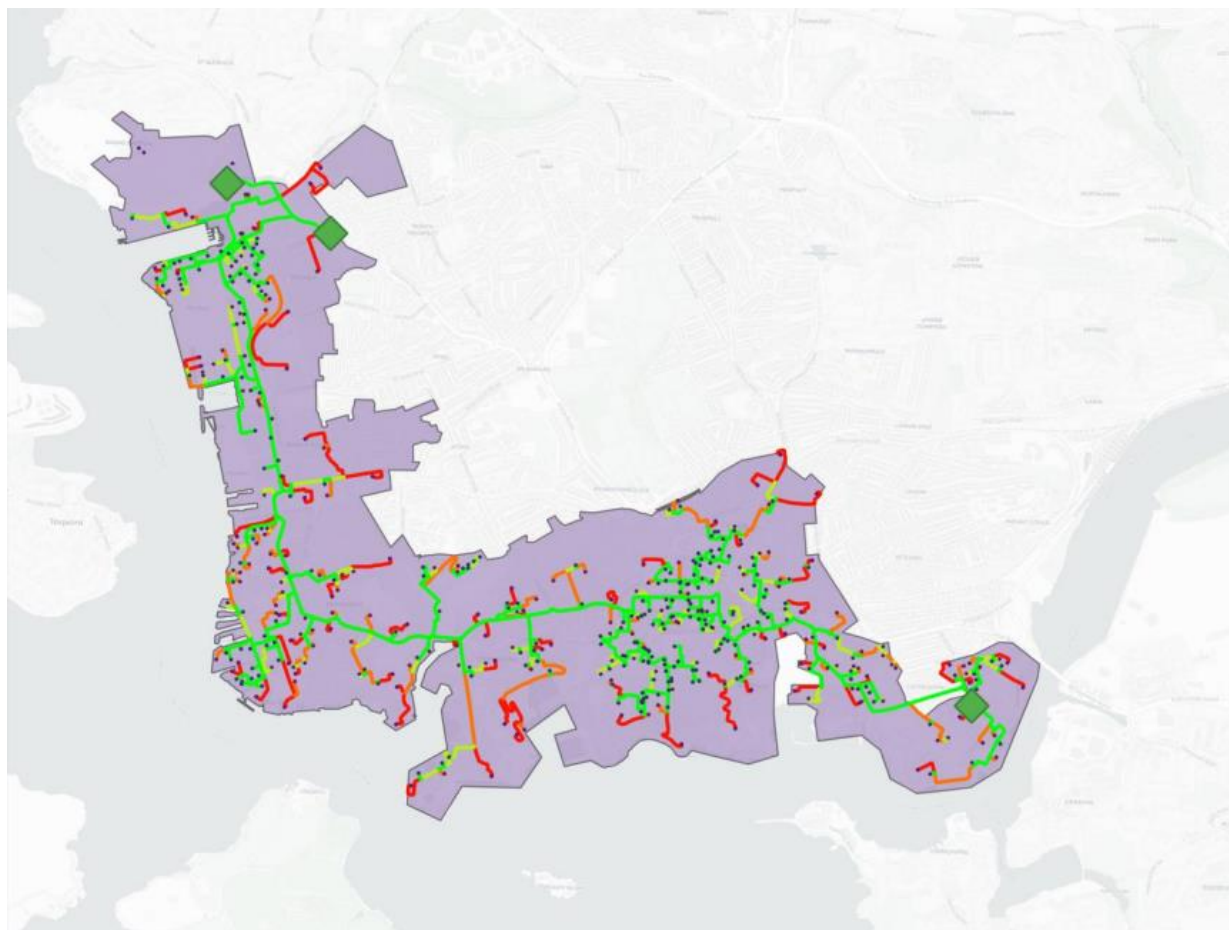


Figure 3. Potential strategic heat network across southern zonal area.

Plymouth has been further supported through the AZP process to move to delivery. DESNZ has directly appointed consultants, who are working to support Plymouth, in terms of technical/ financial/ commercial development for the first phase of zonal roll out, and enable an application for grant funding to the Green Heat Network Fund. This will also support the procurement of a zonal 'Development Partner', to work with the City Council and bring investment, deliver, operate and maintain the network.

The build out of these zonal opportunities would require a number of phases, over a number of decades and a potential initial phase is shown in Figure 4.

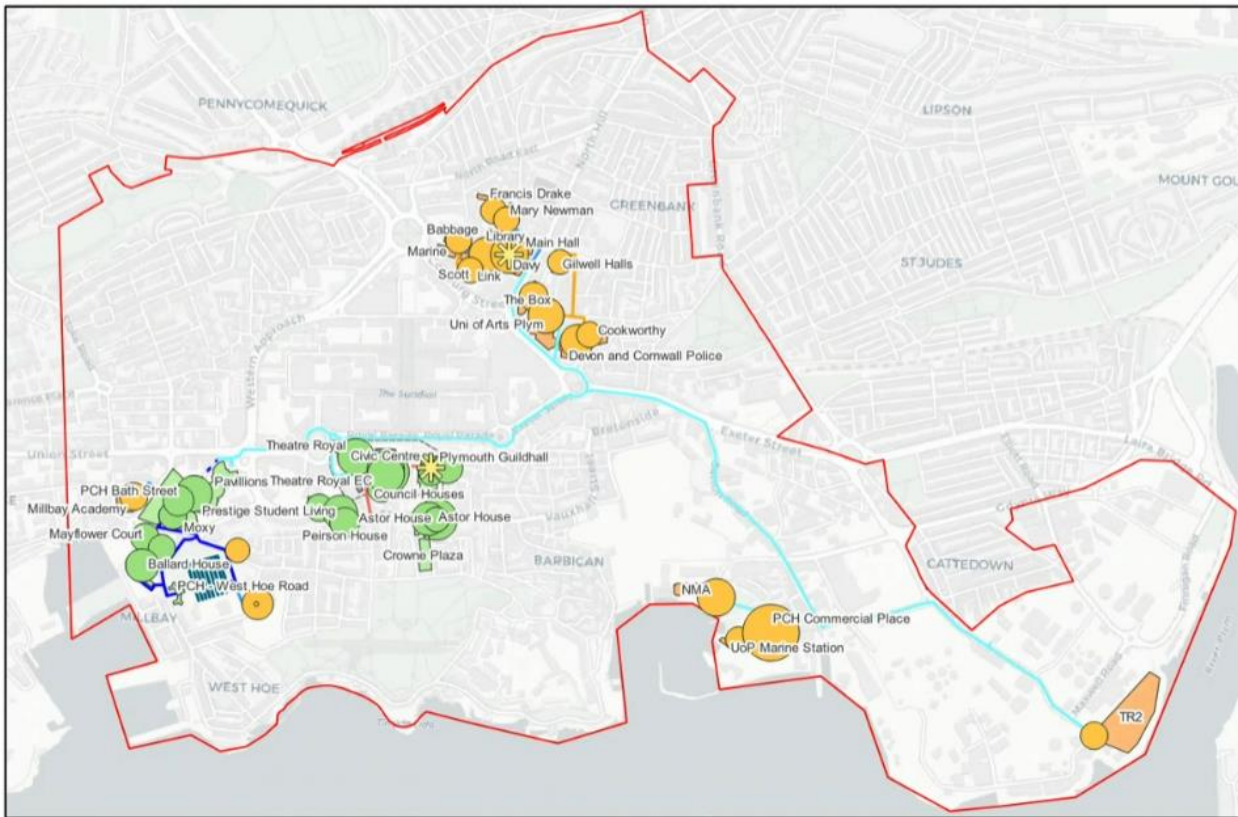


Figure 4. Reference first phase.

Through the AZP work, the city centre zone has been prioritised as the opportunity to start this zonal roll out with the largest scale and opportunity for significant carbon savings. With DESNZ support, proposals for this initial phase have been developed as a reference scheme to take to the market.

This initial phase of a zonal approach would utilise a large source of waste heat from the Cattedown SWW Central Plant to provide heating to a range of clusters of buildings in the Sutton Harbour, City Centre and Millbay areas, including the University of Plymouth, The Box, student housing, Arts University, Devon & Cornwall Police, PCH, the Pavilions, Moxy Hotel, Ballard House and the Civic Cluster. The appointed Development Partner would also commit to complete the existing Civic Centre district heating scheme already being developed by PCC, as a strategic cluster. This phase of works would achieve anticipated carbon savings of 11,000tCO₂ per annum.

The proposed network can provide heating and cooling to these buildings and other buildings as the network expands over subsequent phases.

Significant stakeholder engagement has also been undertaken both through the process of developing this business case, and the years preceding this as the zonal opportunity was being developed.

Department of Energy Security & Net Zero are already directly supporting technical project development, project management, commercial and financial advice, through its AZP programme, to develop the proposals for the first phase of a strategic heat network, including supporting a grant application towards the costs of the first phase and procurement of a delivery partner.

5. MARKET AND INVESTMENT INTEREST

Informal engagement with the market over the past few years and in 2024, has demonstrated strong interest from **heat network developers**, with significant investment to deploy, looking to prioritise which cities work with over the next few years. Indeed, heat networks are not necessarily dependent

on public sector investment. Our engagement in **Government pilot / AZP** work will further increase this market interest.

Market testing was completed on this opportunity in April/ May 2024, and demonstrated significant interest from a range of key industry players, who expressed their interest in the proposals and were very positive about the scale of opportunity.

Estimated investment in this sector nationally is £80 billion to 2050, which requires significant expansion of supply chain, with associated jobs and skills required.

The **Green Heat Network Fund** (Government grant) is a funding source focused on heat networks. DESNZ are providing a support package through the AZP programme, part of which will allow the City Council to apply for GHNF towards an initial phase, as there is already significant demand for this funding.

5. ADVANCED ZONING PROGRAMME SUPPORT AND TIMESCALES.

Involvement in the Advanced Zoning Programme (AZP) gives the City Council a favourable position in securing grant from DESNZ's £280m Green Heat Network Fund (GHNF). It provides DESNZ support to apply through AZP programme towards Phase I. This is particularly important as this will be the final round of the Green Heat Network Fund, with no current guarantee that it will be extended, beyond the final deadline of January 2025.

Significant consultancy support has already been provided directly committed by DESNZ, to support underway for the following:

- Design of Phase I technical proposals, commercial and financial advice.
- Procurement of a development partner
- GHNF application.

The City Council has entered into a non-binding commitment with DESNZ to aim to meet pre-set milestones:

- Current – July 2024: develop zonal outline business case
- July 2024: approval for zonal outline business case, including scope for GHNF bid
- May/ June 2025: selection of preferred delivery partner
- October 2025: final business case developed by preferred partner, demonstrating how Phase I delivery will be commercialised / Approval gateway Phase I (stop/go decision for the City Council and preferred partner)
- December 2025: start construction.

DESNZ is also considering offering further support to AZP councils to move to delivery and PCC is in a good position as Plymouth is in the first tranche of cities (6) being prioritised through AZP support.

Roll out of the scheme in Plymouth is likely to be much earlier than if selection of a district heat delivery partner does not begin until zoning is formally introduced and implemented (from 2025/26).

6. DELIVERY OPTIONS APPRAISAL

A new approach to delivery of heat networks has been proposed by DESNZ to reduce the time and cost to delivery, but also achieve delivery over a zonal scale required to meet the UK's net zero

commitments. Some Local Authorities are now using this approach to work with the private sector to bring investment, deliver, operate and maintain this infrastructure, recognising that they do not have the capacity, skills or resources required to achieve this alone. The approach typically involves the procurement of a development partner based on a set of criteria, and seeking to maximise the local and social benefits, through this process. This procurement approach normally takes 6 months to complete.

The City Council engaged Burges Salmon, an independent law firm, to complete an assessment of potential routes to market, including options for delivery vehicles, alongside commercial advisers (Energy Direction Ltd). This reviewed a number of options, against a number of criteria (which may have different weighting).

In summary, the principal approaches identified are:

- Option 1: City Council owned: the City Council plays a leading role by establishing a wholly-owned subsidiary;
- Option 2: 50/50 Joint Venture (JV) model: the City Council plays a significant role by establishing a 50/50 corporate joint venture vehicle (which will be the heat network developer) with a private sector partner;
- Option 3: City Council led procurement, with two variations on this approach:
 - 3a. Golden share JV model: the City Council plays a residual, strategic role by holding a single “golden share” in a corporate joint venture vehicle (which will be the heat network developer), while a private sector partner has primary responsibilities in relation the heat network developer;
 - 3b. Joint delivery agreement model: the City Council enters into a joint delivery agreement (and governance agreement) with a private sector partner who is responsible for delivering and operating the heat networks within boundary conditions set by the City Council;
- Option 4: Private model: a private sector heat network developer promotes a scheme independently or is selected through a competition run by the Government, to be responsible for the delivery and operation of the Heat Project. The City Council plays no active role in the development or delivery of heat networks.

The results are summarised in Figure 5. Only the City Council owned or JV 50/50 options (Options 1 and 2) would require any City Council capital funding, with the City Council owned option (Option 1) particularly carrying significant risks for the organisation. The Private Option (Option 4) would however limit the City Council’s influence, such as in terms of maximising local or social benefits.

Burges Salmon, Energy Direction and the Council’s procurement team highlighted the need to engage further with market before finalising the detailed option, to ensure any procurement approach is successful and is something that the market can work with. Initial market testing has shown strong interest from the industry, that they have significant funding to deploy and also they can work with either a City Council led procurement (Option 3, including both sub-options a and b) or alternatively a JV arrangement (Option 2). Responses highlight certain characteristics of the proposals being attractive, including the availability of large waste heat sources and the scale of opportunity in Plymouth.

	Private	JDA	JV Golden Share	JV 50/50	PCC owned
Risk Allocation	Green	Green	Green	Yellow	Red
Financial Implications to PCC	Green	Green	Green	Yellow	Red
Governance	Green	Green	Green	Yellow	Yellow
Operational Decision Making	Yellow	Yellow	Yellow	Yellow	Green
Alignment with AZP timescale	Green	Green	Green	Red	Red
Alignment with Legislation	Green	Green	Green	Green	Yellow
PCC influence	Red	Yellow	Yellow	Yellow	Green
Social Value	Yellow	Yellow	Yellow	Yellow	Green
Alignment with Market	Green	Green	Green	Yellow	Yellow
Attracting Finance	Green	Green	Green	Yellow	Red
Managing delivery	Green	Green	Yellow	Yellow	Red

Figure 5. Burges Salmon analysis of the main delivery options.

Under the different delivery models there are different risks and rewards as set out briefly in Figure 6.


	Option	Risk	Reward
	PCC Owned and Managed	Substantial ongoing finance required Major financial risks and liabilities Reputational risks if the energy company fails	Retain full control over project Retain all profits if successful Social value outcomes able to be maximised
	Joint Venture with Shareholding	Limited liability as a shareholder Greater financial implications and risks, depending on level of shareholding Greater reputational risks	Greater influence on social value and other outcomes Potential revenue generation
	PCC led procurement	Can be delivered without significant financial implications or risks for PCC No PCC liability for delivery or operation of the network what company Some reputational risks	Influence on social value and other outcomes Little or no opportunity for revenue generation
	Private Sector only	No financial implications or risks for PCC No control of phasing / locations Greater risk of cherry picking.	Little or no influence on outcomes No opportunity for revenue generation

Figure 6. Risk/ Reward analysis of the main delivery approaches.

Cabinet on 9th September 2024, endorsed the PCC led procurement approach on the basis of the its limited risks and significant scope for reward. As part of the subsequent Business Case, options 3a) and 3b) will be assessed in greater detail to determine the optimum approach, which can then be taken forward.

This option **does not** require the City Council to commit any capital investment to delivery. The Council’s role would be in relation to procuring a development partner who could take **all** of the financial risk.

Some clear benefits would seem apparent from the City Council taking the lead in this way:

- It would be able to maximise benefits for Plymouth including jobs, skills, carbon, fuel poverty alleviation, and cost of heat (e.g. City Council buildings).
- It helps ensure a development partner is secured who best aligns with City Council objectives.
- It provides the City Council with greater control over the delivery process - e.g. where and when pipeline is laid in streets along the route.

It helps ensure that supply chain interest is focused on Plymouth as one of the national frontrunners, rather than pushing the city to the back of the queue.

7. PREFERRED OPTION

The PCC led procurement approach has been assessed in greater detail to determine the optimum approach, which can then be taken forward.

Further analysis has been completed with legal and commercial support on the options using this approach, which include the Governance Agreement Model, the Golden Share Model and the Development Agreement only model (which relies on national regulations when enacted).

The preferred option is the Golden Share delivery model, the submission of an application for grant funding towards the first phase of development to the Green Heat Network Fund.

Under the preferred delivery vehicle PCC would seek to transfer the majority of risks to the private sector partner although the private sector partner would seek to further transfer risk to developers and / or end customers where they are able to do so.

The commercial model should enable PCC to meet its key objectives and its desire for ongoing engagement.

The Golden Share. The Council's requirements would be captured in the shareholders agreement and the reserved matters. Typically, under a Golden Share arrangement the entity is seeking to ensure the integrity of the company as well as key operational aspects of the project are achieved. Where these requirements are not met the Council would seek remedy under corporate law rather than contract law.

The Council would have an observer seat at the board of the Joint Venture and as such provide full visibility of the company operations, as a long term and very significant scale project for the City.

A similar approach is also being used by Worthing Borough Council and Old Oak & Park Common Development Corporation in London for delivery of their heat network proposals.

Although there could be a conflict of interest if the Council were to undertake the role of Zone Coordinator under future zoning regulations, this can be managed in a similar way to other statutory functions (e.g. Local Planning Authority) with systems in place to avoid this.

8. ALTERNATIVE OPTIONS

Alternative options considered and rejected under the PCC led procurement approach are;

- **Development Agreement only** (e.g. South Westminster Area Network). Rejected due the risks of lack of long term influence over a range of issues, especially those not directly covered by the new legislation, when this is confirmed (e.g. social value).
- **Governance Agreement** (e.g. Sunderland). Although similar in some respects to the Golden Share approach, but instead relying on contract law, this was rejected as it offered less transparency. This approach also couldn't take advantage of the government templates available, reducing potential risks, time and cost.

9. FINANCIAL IMPLICATIONS AND RISK

1. Funding has already been identified to cover the revenue costs by the City Council to support the procurement (alongside Government DESNZ funding), from a variety of Section 106 contributions and grant funding, all of which is specifically ring-fenced for heat networks and cannot be used for any other purpose. These are currently considered to be sufficient to cover the support needed up to the appointment of a development partner. The risk of any additional revenue costs

being identified over and above this is considered to be very unlikely, and should this arise, would need to be secured from other agreed sources such as DESNZ or from the SP&I budget, by prior agreement from the Service Director for SP&I and Finance.

The proposals can be delivered without any requirement for Council capital funding. As the Council would not be deploying any capital funding for the delivery of the scheme, the financial risk is considered to be very low.

The City Council can support delivery (the attractiveness of the proposals for the private sector) by applying for Green Heat Network Fund grant funding towards phase I of a heat network, with the delivery partner taking on the grant agreement, rather than the City Council.

10. TIMESCALES

Assuming the City Council is leading the process, below is an indicative timeline showing the respective roles to procure a Development Partner.

Milestone	2024				2025				2026	2027	WHO LEADS?
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1-4	Q1-4	
Technical reference and financial model Phase I scheme	Yellow	Yellow	Yellow								DESNZ
Phase I: Green Heat Network Fund application				Yellow							DESNZ
Phase I: GHNF decision					Green						GHNF
PCC Business Case approval			Light Green								PCC
PCC Procurement Development Partner				Light Green	Light Green						PCC
PCC Negotiation and final agreement with preferred bidder						Light Green					PCC
HND develops Phase I to commercialisation							Blue	Blue			HND
Approval Gateway PCC & HND								Light Green			PCC/ HND
HND Financial Close								Blue			HND
HND Commences Construction									Blue	Blue	HND

DESNZ: Department for Energy Security & Net Zero
 HND: Heat Network Developer
 GHNF: Green Heat Network Fund

Across both zones, the initial estimated investment value has been assessed to be in excess of £350M (£300m City Centre/ Waterfront and £50m Derriford).

Roll out in phases from 2026 to 2050 (and beyond). Phase I is anticipated to include University area, Civic quarter and Millbay, using surplus heat from the South West Water Central Water Treatment Works, Cattedown.