STONEHAVEN
A SHGH Company

Recycling Heat

THE CASE FOR HEAT TRANSMISSION

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01 Executive summary

HEADLINES

- Waste heat from industrial sources is the cheapest form of low carbon heat. Getting it to where it is needed means building transmission-scale pipes.
- The cheap heat flowing through these pipes would be protected from international price shocks and support economic growth and local employment.
- To fund these Strategic Heat Mains we need to learn lessons from other successful infrastructure projects of similar scale, such as Thames Tideway, and create a vehicle that can share costs across networks.

THE PROBLEM

The UK is in its second energy crisis in five years. If Russia's invasion of Ukraine did not make it clear, the current Gulf crisis shows that our energy supply needs to be secure and not subject to global disruption. Repeated cycles of external gas price shocks are degrading our prosperity.

THE SOLUTION

Half of our gas is used to heat buildings. We can replace it with energy sourced from the UK. This could be atmospheric or low grade heat captured through heat pumps at sewage plants and data centres, as well as heat produced from treating our own waste. But getting heat from sources like our waste into the town and city centres where it can be used means building new infrastructure to transport it.

The Government already plans to enable new networks to distribute heat, but recycled heat will require larger transmission-style infrastructure, namely large pipes. To get these pipes financed, we need to take lessons from one of the UK's most successful pipes – the Thames Tideway project. This used a novel structure to hold down costs and compel quick delivery.

If the Government can deliver a framework for Strategic Heat Mains quickly, its response to this crisis can ensure that next time many are protected from price shocks: we would heat homes and offices with industrial processes, and the rubbish that we've thrown away.

02

Getting heat to where it needs to go

A New Generation of Heat Networks

The Government's recent Warm Homes Plan[1] emphasised the significant role heat networks will play in decarbonising heat in buildings. The Department for Energy Security & Net Zero (DESNZ) hopes to double the volume of heat delivered by such networks by 2035, to 7% of overall heat demand.

Alongside the Warm Homes Plan DESNZ published its decision on how heat zoning will be implemented[2]. 'Heat zones' are spatial areas in which the exclusive right to develop a heat network will be put up for tender. Zones will be determined by a Zoning Authority and individual zones administered by a Zoning Co-ordinator.

Achieving the Government's scale of heat network deployment – even with zoning regulation – is only politically and commercially possible if heat can be offered to ultimate consumers at a price close to the counterfactual gas heating price. This is because no consumer will be obliged to take heat from the network, and therefore uptake will be driven by price. Given that:

(a) heat network infrastructure needs to be financed over an initial period when it is competing with gas infrastructure that has already been financed and paid down, and

(b) early heat networks will need to meet these early financing costs with a small "early adopter" user base,

this is only possible if a very low input heat cost can be achieved.

Very low cost input heat is available from strategic waste heat sources, but these are often located at a distance from demand. Getting this heat to heat networks that can use it requires an asset class which is

[1] *Warm Homes Plan - GOV.UK*

[2] *Heat network zoning consultation 2023: summary of government response - GOV.UK*

decades old internationally but novel within the UK – Strategic Heat Mains. These are common in Northern Europe (e.g. Berlin, Amsterdam, Copenhagen) and parts of Asia (e.g. Beijing, Seoul).

Strategic Heat Mains are transmission systems, which are distinct from – and supply heat to – heat distribution networks, which in turn supply thermal energy to end consumers. It is suggested that all existing and currently funded UK heat networks are distribution networks. In mature utility sectors in the UK (and in district heating in other jurisdictions) formal definitions and regulations often distinguish transmission and distribution networks. In guidance published for Round 11 of the Green Heat Network Fund in February 2026, DESNZ defined Strategic Heat Mains for the first time, as follows:

> ***Strategic Heat Mains:*** *A Strategic Heat Main is a high-capacity heat transmission infrastructure (typically an oversized, long distance district heating pipeline) that carries thermal energy in bulk from one or more major supply points to multiple demand centres of local networks. They are characterised by the ability to integrate diverse heat sources (e.g. energy-from waste, other industrial waste heat, large heat pumps or geothermal) and delivering heat to third party network operators or zones. Strategic Heat Mains do not primarily supply end-users directly; instead, they function as the interconnecting transmission tier of heat infrastructure, enabling town or city-scale heat exchange and supporting decarbonisation by utilising low carbon heat sources at scale.*

Box 1: The Benefits of Heat Transmission

While the principal driver is cost, it is noted that using strategic waste heat via Strategic Heat Mains also meets other highly desirable policy / practical outcomes

The UK's Heat Need	Strategic Waste Heat Sources
Clean heat – heat makes up nearly 50% of the carbon footprint in city centres; gas boilers make up to 70% of NOx	*High grade waste heat is low carbon as it leverages existing heat – e.g. EfW heat is typically available at 15g CO_{2e}/kWh – a c.94% reduction on natural gas, lower than heat pumps; complete removal of gas boiler NOx*
High temperature heat – appropriate to the UK's legacy building fabric and building heating systems	*Heat available at 90C from anchor strategic waste heat sources, suitable for legacy heating systems*

Economic growth – by enabling investment and jobs	*Very high Treasury Green Book benefit : cost ratios on example projects over 5:1*
Energy security – without heating relying on imports	*Heat is sourced from existing waste heat sources*
Reducing strain on the electricity grid – this is needed for other decarbonisation / electrification work	*No absorption of grid capacity, avoiding costs / upgrades, and leaving grid capacity for other needs. Large scale thermal storage can also provide peak load shaving, and long duration energy storage to the electricity system.*
Supporting cooling – as summers become hotter	*Potential to supply cooling via absorption chillers, with most capital costs met via heating business case*

As Strategic Heat Mains are a proven engineering solution, they are relatively simple projects to finance, but for two challenges:

A. Scale / demand certainty: Deploying strategic waste heat via Strategic Heat Mains is only economically efficient if deployed at scale. That scale translates to certainty of demand for Heat Transmission developers.[3]

B. Timing: There is a need to give confidence that this class of infrastructure will come forward at such a pace as to support a first generation of zonal scale heat distribution networks that would otherwise need to invest in capital-intensive energy centres, the costs of which would need to be recovered from consumers regardless of the cost of heat from the Strategic Heat Main.

Scale / Demand Certainty

A key challenge for Strategic Heat Mains is that the heat distribution networks which would buy heat from them have not yet been built out and established a customer base. Until the distribution networks have been fully developed they are not be able to sign long term purchase agreements for heat from the Strategic Heat Mains, with the volume certainty that would be required to privately finance the Strategic Heat Mains. Without certain sales volumes (and therefore revenue) private funders (such as pension funds) are not able

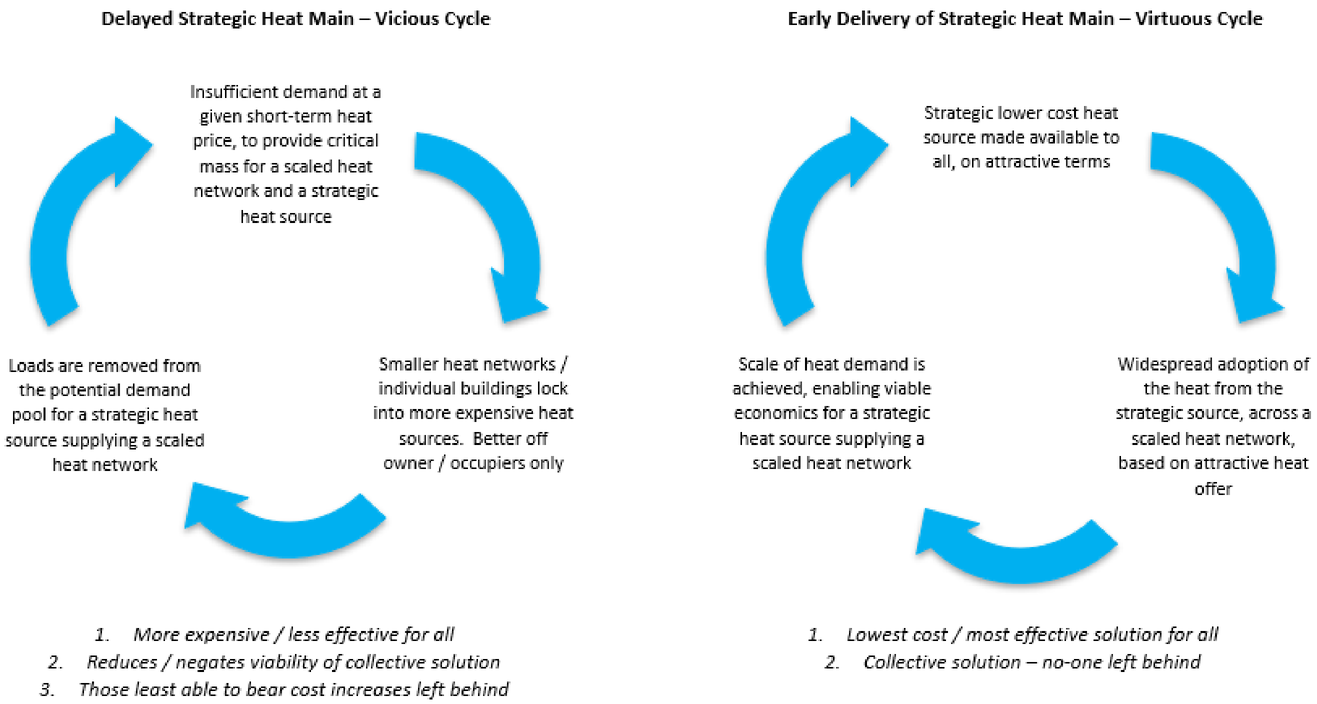
[3] This is akin to a similar but distinct demand certainty challenge for heat distribution networks. The difference for Strategic Heat Mains is that (1) it is often not possible to phase development for a Strategic Heat Main as it is for a heat distribution network, as almost the entire infrastructure is required to transmit heat from A to B to being commercial operation – and the scale of the required offtake makes it practically impossible to contract the scale of heat demand in advance, and (2) unlike heat distribution networks, once scale is achieved, no further interventions are required to make Heta Transmission Mains economically sustainable against the energy cost counterfactual because of the low input heat cost – i.e. a competitive heat price can be achieved naturally, following scaling.

to finance the projects. At the same time, the distribution heat networks may not be able to scale effectively without access to the abundant low-cost and low-carbon heat that the Strategic Heat Mains can provide. This creates a "chicken and egg" situation, based on a gap in heat supply and demand assurance (the Supply / Demand Assurance Problem).

Timeframe

The first zonal heat distribution networks have "heat on" targets of c.2030 and scaling plans in the early 2030s. It is also likely that key anchor consumers of heat will start to target heat decarbonisation at about this time. If there is not a clear path to provide low-cost heat via a Strategic Heat Main in time, heat networks may lock into more costly heat supply arrangements (by locally generating heat), and/or individual buildings may establish more costly building level solutions. While only a portion of buildings will be able to afford to opt into this solution, these are likely to be key anchor heat loads, concentrated in city centres, and the removal of these critical loads could compromise the business case for large scale heat networks – which in turn Strategic Heat Mains rely on. This could result in a two tier outcome, perpetuated as a vicious cycle, whereby only wealthier building owners could access next generation heat sources (albeit these would cost them more than counterfactual Strategic Heat Main supplied heat), while less well-off owner / occupiers – including public and third sector organisations – would not be able to move to a new heating solution, and would remain with the price volatility and steadily rising infrastructure costs of gas.

Figure 1: The chicken-and-egg problem facing Strategic Heat Mains



Managing these risks so as to correct market failure and provide optimal public outcomes will involve some kind of support mechanism. While this is a challenge it is also an opportunity – if the market failures around sequencing and timing can be addressed, Government can unlock a proven pathway to sustainably supply abundant, low cost, low carbon heat – heat that would otherwise be wasted.

This paper suggests frameworks to achieve this, acknowledging the very real political and cost of living constraints that policy in this area can and should contend with.

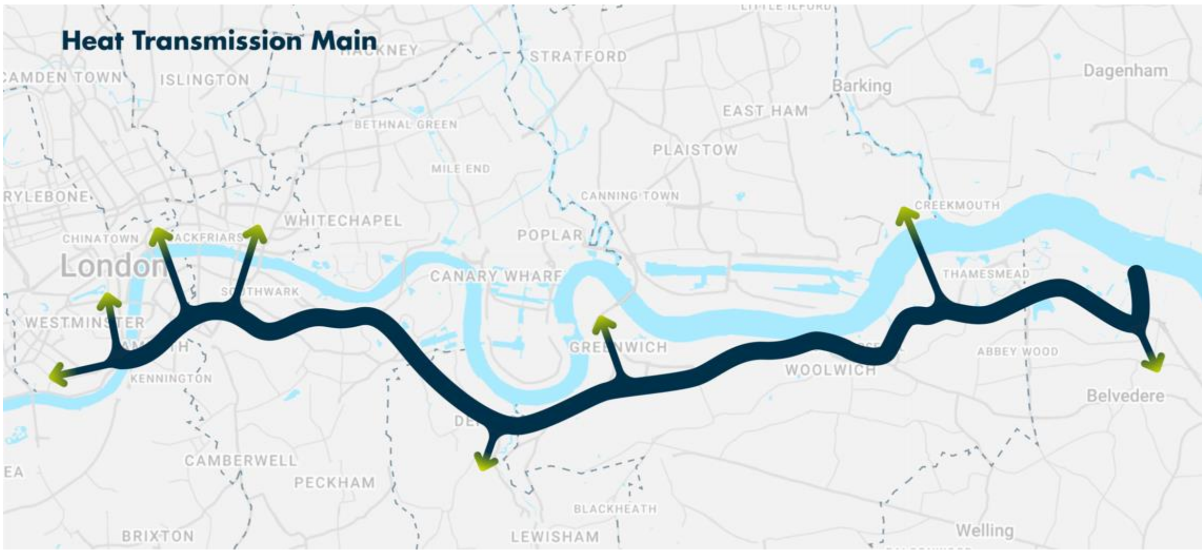
Box 2: Illustrative heat transmission project – Cory Strategic Heat Main

Cory is a major waste management company that has operated on the Thames for over two hundred years. It operates and is expanding what will soon become Europe's largest energy from waste operation at their Bexley site in East London (**Cory Riverside**), with capacity to export c.3 terawatt-hours of heat at 100C, equivalent to the demand from over 300,000 homes, or the total annual demand of the City of London plus half the City of Westminster. Under a recent study completed by the Greater London Authority (**GLA**), it is the largest high grade waste heat source in Greater London.

Cory have proposed the development of a Strategic Heat Main to get this heat to the planned heat distribution networks along the Thames (Figure 2). For these networks, the relative low cost of heat the Strategic Heat Main could offer may be the difference between their commercial success and meeting scaling ambitions (in achieving government policy ambitions) and a failure to deliver.

The heat main would be constructed via a c.24km tunnel system, which would transmit high flow temperature heat suitable for heating London's historic buildings.

Figure 2: Initiative route of the Cory Strategic Heat Main



Initial feasibility studies covering heat extraction, tunnel engineering and hydraulic design have been completed, and in 2025 the project was designated Nationally Significant by the Secretary of State for Energy Security & Net Zero, under s.35 of the Planning Act 2008. This enables the Development Consent Order process to commence, under which land assembly rights and project consents could be granted. Letters of support for the project have been issued by the seven local authorities on the route, the GLA (which has proposed multiple Strategic Heat Mains across London), key statutory stakeholders, industry associations, and the leading developers of heat distribution networks in central London. The heat main has been designed to enable other strategic heat sources to provide heat along the length of the main – Cory Riverside being the initial anchor heat source. Assuming that a final investment decision can be taken in 2028/9, the project is targeting being operational in the early 2030s.

03 How we've delivered similar infrastructure

Nothing new under the sun

For the purposes of developing options for heat transmission delivery our first stop should be interventions that have successfully delivered infrastructure of a similar scale. This chapter outlines these interventions.

GB Energy Transmission

The existing energy transmission regime relates to electricity and gas exclusively. Licenced operators are able to recover the costs of existing and new infrastructure from consumers, and are prevented from making excessive returns through a price control process. Unlike new heat transmission projects, electricity and gas transmission operators inherited an existing customer base at privatisation. This provided immediate scale, and this customer base has no option for the provision of equivalent energy services aside from these licenced operators, beyond generating onsite. New customers of heat networks will not be at scale during an initial build out period, and will typically have at least one connection to an alternative energy vector that can provide an equivalent service.

An explicitly equivalent regime is therefore not possible, as consumers have the absolute ability to select other vectors. This means that to provide a guarantee of offtake a heat transmission line must also be able to guarantee cheaper heat.

Thames Tideway

Provisions exist under the Water Industry Act 1991 to designate a Specified Infrastructure Project for the delivery of infrastructure that is necessary but cannot be delivered by existing undertakers without direct project support – in this case because it may otherwise threaten the ability of a water or sewage undertaker to provide services for its consumers. The Thames Tideway project – essentially a significant expansion of

London's sewage capacity – was designated as such a project, noting the extent to which London's historic sewage system was in danger of overloading.

It was delivered via special purpose vehicle (SPV) financed by an array of infrastructure funders. Project revenues were recovered from existing utility customers in the relevant area (i.e. Thames Water customers), with the utility acting as a collection agency for the project. This provided guaranteed revenue.

Although some system costs, such as supplier failure costs, are recovered through energy network costs no equivalent provision exists for energy.

Sizewell C

The UK's second European Pressurised Reactor has now been fully financed and will be constructed at Sizewell in Suffolk, alongside the last nuclear reactor to be constructed in the UK. Unlike its predecessor at Hinkley Point in Somerset, it has been financed under a novel regulatory asset base regime that provides for income during construction. This was judged to be necessary given the relatively long (10 years plus) construction period of the project, during which the capital locked up in the project would otherwise make no return.

Payment for these returns comes from a special levy on electricity bill payers, provided for in the Nuclear Energy (Financing) Act 2022. This created a regime that could in theory apply to any nuclear project, but so far has only been applied to Sizewell C.

Contracts for Difference / Dispatchable Power Agreements / Hydrogen Business Model / Industrial Carbon Contracts

These are a family of interventions made by DESNZ to bring on particular components of a decarbonised energy system. While CFDs and DPAs are funded by billpayers through a bespoke levy on electricity consumers, the Hydrogen Business Model is funded via a levy on gas shippers and Industrial Carbon Contracts are funded by the Exchequer. They differ from the above mechanisms inasmuch as they are intended to be used multiple times without recourse to regulatory changes. They typically provide some kind of revenue assurance via a private law contract. Revenue assurance is based upon an enduring lien on consumer bills, recovered via energy suppliers. This eliminates political risk for their beneficiaries, something vital for projects that will endure for generations.

04 What we can learn from this

For the purpose of solving our problem we should look to the reasoning as to why each intervention was undertaken and how that reasoning shaped the intervention:

- Government intervenes to correct *market failures*. This is a fundamental principle that underpins Green Book[4] analysis, and means that interventions should be intended to optimise social welfare, assuming that markets would otherwise achieve this if not for the reason the policy is implemented.
- Interventions can include novel support mechanisms for large infrastructure where private capital would otherwise be unable to deliver – or to only do so where it would impose prohibitive costs to consumers. The relevant market failures for the above include, *inter alia*, the reluctance of private capital to back projects with extremely high capital requirements and construction periods, responding to infrastructure shortfalls at pace, and supporting low carbon projects that are not financeable under current electricity wholesale market arrangements.
- Licence-based or contract-based mechanisms are now preferred for achieving these objectives, eschewing prior arrangements that involved obligations or cash transfers. This is a function of the relative success of such interventions in holding down capital costs, as they greatly reduce the risk to the investor.
- At the same time, the interventions above precede the current political uproar around the cost of living and energy bills in particular. The Chancellor’s intervention in the 2025 Autumn Budget to remove key scheme costs from energy bills is indicative of the current debate.

This enables us to develop a list of options that are more likely to be deliverable within resource and political constraints, discussed in the next chapter.

[4] *https://assets.publishing.service.gov.uk/media/6645c709bd01f5ed32793cbc/Green_Book_2022__updated_links_.pdf*

05 Options for delivery

Using the above precedents, we can identify the following categories of option:

- *A Regulatory Asset Base*. This is a structure that implies an enduring right to revenue at a specified level based on the book value of investments into network assets. For the purposes of heat transmission, this would require a licencing structure equivalent to existing energy networks in order to provide assurance that charges to distribution networks could be passed through to consumers directly. There are multiple forms of this option:
  - *A shadow RAB*, providing short-term liquidity and longer term revenue assurance. The paper discussing this option has been previously shared with DESNZ.
  - *An SPV attached to an existing RAB*. This is the Thames Tideway model, and would require amendments to the Gas Act 1986 and/or Electricity Act 1989 to permit an equivalent revenue collection role for other networks to fund the heat transmission asset There is partial precedent for this, in that Ofgem's costs are shared across heat network, gas, and electricity companies, to fund their function as the new heat network regulator. The Thames Tideway model includes a competitive component for the infrastructure provider, but there are other mechanisms to ensure value for money in this context, noting the Strategic Heat Main project participants are likely to be predetermined by strategic heat source owners (who will need to agreed to significant operational updates in order to maximise heat export) and appointed zonal network developers.
  - *An SZC-style RAB.* A bespoke Heat Network financing bill would be required to implement a similar structure, although it is unclear whether the risk associated with construction of the heat main would be considered sufficient to justify payment in advance of completion.
  - *Extension of an existing licence to provide assurance*. In this model an existing monopoly provider, most likely the incumbent GDNO (SGN) or National Gas would pay for an equity stake in the project and in exchange for the relevant portion of the revenue would add the asset to their RAB and provide a revenue stream for the heat transmission project. This may represent an unacceptable loss of control as well as revenue dilution.
- *A Binding Contract*

- *A standard Contract for Difference*. This option specifically for EFW facilities involves the heat source of the project either bidding for a CFD in Pot 1 in the next allocation round or seeking a directly negotiated CFD with DESNZ. The CFD would be based on the electrical output of the EFW facility, and be set at a strike price sufficient to cover the costs of financing the Strategic Heat Main.
- *An extended Industrial Carbon Contract*. EFW facilities undertaking carbon capture would produce heat with negative CO_{2e} emissions. A version of an ICC contract sufficient to cover both the capture equipment, sequestration arrangements and the heat transmission pipe would be investible. Upside sharing with HN consumers would need to be made explicit on the face of such a contract, as otherwise all heat sales would potentially be subject to clawback under standard ICC terms.
- *A Heat Cost CFD*. Heat network stakeholders have been examining the possibility of a Heat Cost CFD. This would take the form of a strike price the network operator would be guaranteed to receive on sale regardless of the actual sell price. This would enable heat network owners to sell their output consistently below the price of gas, ensuring that offtake is essentially guaranteed. This would be a CFD for distribution networks rather than the transmission main and to provide an equivalent guarantee of offtake would likely require a meaningful proportion of the networks served by the main to hold such a contract.

06 Comparing Options

In order to assess the above options we need a set of criteria against which we can evaluate them.

The first, and most important given the need to secure investment, is the extent to which the option provides *revenue certainty* of the kind that an infrastructure investor would recognise. This could be expressed as how close the option comes to providing an equivalent level of certainty to a gilt. If we understand a gilt as a right to a coupon where that coupon is guaranteed by the State, we can evaluate options against this standard.

The second criterion is the *deliverability* of the option, expressed as the volume of work necessary for Whitehall to ensure that the option happens. This can be expressed as likely official time. Resource constraints are a significant consideration of DESNZ in evaluating options inasmuch as justification for spending officials' time must be provided.

The third criteria is *timing*. An option that ticks the above boxes but is not deliverable before investment decisions are locked in in the mid-late 2020s risks early networks being unable to access waste heat, being uncompetitive with gas and thus being unable to deliver.

We will rank each option against each criteria, a higher number equals a higher rank. We will then develop the option with the highest combined rank in more detail, doubling the revenue certainty score to reflect its importance.

1. Shadow RAB	Rank
Revenue Certainty	1. A shadow RAB would require a liquidity pool of some scale to support a heat main project, at a level significantly beyond the scale needed for distribution networks. Inasmuch as a limited pool of funding would need to be prioritised for offtakers, this does not offer any certainty of revenue.
Deliverability	7. This is a very light touch option that works alongside existing workstreams and requires minimal change to regulatory measures, being almost entirely driven by licence arrangements.
Timing	7. This would be available alongside network build-out.

2. Existing RAB - SPV	Rank
Revenue Certainty	**7.** This is an explicit guarantee of a defined level of income collected by a third party using existing arrangements.
Deliverability	**3.** This would require a primary legislative mechanism (albeit a potentially simple one) as well as a programme to follow on from legislation.
Timing	**4.** This could reasonably be delivered alongside delivery, but is contingent upon early primary legislation.

3. SZC-style RAB	Rank
Revenue Certainty	**6.** This requires some relatively novel arrangements for revenue collection, but the precedent of Sizewell C minimises the risk of this.
Deliverability	**1.** Development of the SZC RAB took at least eight years from inception to delivery, dozens of officials and a bespoke piece of primary legislation.
Timing	**1.** As above, this would unlikely to be available in time.

4. Licence Extension	Rank
Revenue Certainty	**3.** This creates novel project control risks and thus presents a significant challenge to a capital raise.
Deliverability	**6.** This relies on an existing mechanism, but requires appetite from both Ofgem for licence amendments as well as the gas licencees themselves. It may require primary legislation inasmuch as it goes beyond the scope of the Gas Act 1986, however, there may be routes around this.
Timing	**2.** This option relies on Ofgem making a rapid decision on a topic of considerable change and that goes to the value of existing networks. Precedent implies Ofgem would seek to align it with a price control cycle, likely pushing this into the 2030s.

5. Standard CFD	Rank
Revenue Certainty	**4.** CFDs are well understood by capital markets and a twenty year contract should be sufficient to raise debt, although long-run questions about revenue to support REPEX would arise. However, it is unclear how support for heat would be included.
Deliverability	**5.** There is an existing competitive framework in which EFW could compete, however, there is little prospect of success at the price needed to deliver support for the heat main given such projects would be in a pot with

	onshore wind and solar. It would likely require a bilaterally negotiated contract. Heat sales being incorporated into the revenue stack of the project is potentially problematic for any negotiation, inasmuch as a CFD is intended to reward projects purely for electrical output and the Treasury is likely to object, and such an approach would need to account for uncertainty in heat sales levels.
Timing	6. This could be available on time, definitely so in the event a competitive contract is won. It compares less favourably to the RAB options inasmuch as the potential for HMT objection is significant.

6. Extended ICC	Rank
Revenue Certainty	5. Similar to a CFD, albeit a model that capital markets are less familiar with. It also carries additional risk of revenue claw-back.
Deliverability	2. While existing ICCs have been bilaterally negotiated, delivering an ICC that covered a project component not ultimately related to sequestration is a tall order and would require considerable co-operation by teams across DESNZ, including on legislation. It would also require an explicit bespoke agreement around the allocation of heat revenues, which would be challenging to manage.
Timing	5. This would require considerable work by DESNZ, more so than a standard CFD.

7. Heat Cost CFD	Rank
Revenue Certainty	2. While this option would provide considerable certainty to distribution networks and improves the prospect of lower heat costs, it reduces the incentive of heat network operators to engage with the Strategic Heat Main except where the cost reductions are considerable. It also requires contracts to be signed with at least a majority of potential customers before the capital raise.
Deliverability	4. This would require primary legislation as well as the development of what would be a novel contract and a framework for allocation. This is a considerable resource load.
Timing	3. Based on the precedent of the original CFD, this would take five years to deliver.

07 Selecting Options

We have taken the ranks allocated to each option above and aggregated them in the above table.

Option	Aggregate Rank (Max 28)
Shadow RAB	15
Existing RAB – SPV	21
SZC-style RAB	14
Licence Extension	14
Standard CFD	19
Extended ICC	17
Heat Cost CFD	12

The option that scored the highest was Existing RAB – SPV. We will look at this option in greater detail in the next chapter.

08 Refining Options

For all variations of an Existing RAB – SPV model, Government would need to update its regulatory regime. There are several core changes necessary. The first is that a carve-out for an SPV is created through primary legislation that creates similar clauses to the Water Act 1991. Where this will differ from the framework used for Thames Tideway is in the *justification* for the creation of the SPV. The test in the Water Act for creating regulations that would underpin an SPV is:

> *36A(4)The regulations—*
>
> *(a)may make provision only in relation to projects or works that in the Minister's opinion are of a size or complexity that threatens the undertaker's ability to provide services for its customers, and*
>
> *(b)in conferring powers, must restrict them to projects or works that, in the opinion of the person exercising the power, are of a size or complexity that threatens the undertaker's ability to provide services for its customers.*

In (b) the 'person' is the Authority, Ofwat in the case of water and Ofgem in the case of heat networks[5]. Although the test is somewhat opaque it is intended to capture a sense in which a project would be of a sufficient scale to greatly consume the bandwidth of the relevant water company's management team and thus reduce the service provided to consumers.

This test is of no relevance to novel heat transmission projects as it relates to the core services of a regulated utility and the provision of hot water for heating purposes does not fall under the remit of any existing regulated utility. A new test is required.

In creating new legislation there is a trade-off: Parliament traditionally pushes back on new clauses that provide powers that are too broad, but such powers that can be used for other relevant purposes could be beneficial beyond heat transmission. Therefore a test that amounts to,

> *"In the view of the Minister this is a strategically important project,"*

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[5] *Given the forthcoming regulation that will underpin the Heat Network Zoning Authority, it is unclear whether that Authority or Ofgem would be most appropriate in this role until that regulation is finalised.*

is unlikely to be successful. A more successful test may be,

> *"In the view of the Minister on receipt of relevant advice from the Authority, this project would make a meaningful contribution to the objectives of the Secretary of State as laid out in the Climate Change Act 2008, cannot be delivered by companies licenced under the Gas Act 1986 or the Electricity Act 1989 under the terms of their licences, and is of a scale and complexity that without such designation there is a threat that the project could not be delivered."*

Here we can learn from the provisions of the Nuclear Financing Bill by enabling Ministers to designate projects as eligible for this system. Provision would also need to be made for projects that cross the boundaries of devolved nations.

The second core change would be the regulations made under the powers suggested above. The regulations would need to confer particular powers on Ofgem for the purpose of delivering these projects. These powers would need to cover:

- The ability to nominate a licenced company or companies for the purposes of collecting revenue to pay for the project;
- An amendment to the price control settlement for that companies or companies that permits them to raise a specified amount of revenue, potentially outside of the price control cycle;
- The ability to designate a provider for the delivery of the project;
- The powers that would need to be conferred on the provider for the purposes of project delivery, which may include wayleave and rights of entry, and;
- The ability to confer a project licence on the provider that specifies its obligations against the project and how it can recover its costs.

Within these powers are several variations of the SPV option:

- Whether costs are recovered from gas or electricity or gas *and* electricity (in addition to heat network customers);
- Whether costs are recovered from licenced companies that operate in the geography of the project, or from all licenced companies;
- Whether costs may be recovered purely as a backstop to revenues from heat distribution networks if and when they become available, or whether cost sharing across networks is appropriate, and;
- The time frame over which these powers may be exercised and thus for what period revenues may be transferred.
- How heat distribution networks may be charged for access to the transmission network; essentially the configuration of a price control.

Cost sharing would enable a lower cost of heat for heat network customers in exchange for higher bills for customers of other vectors. The politics of bill additions are challenging. However, if:

1. this allocation of costs also saves consumers money, by giving revenue certainty that enables projects with the greatest system level efficiency to come forward;
2. these costs transfer to heat network customers in whole or greater part as uptake of connections progresses; and
3. there is flexibility to profile costs over time

this may be made more palatable. A strawman is set out in the Annex.

Primary Legislative Powers

Designing this scheme requires consideration, but opportunities to update primary legislation occur infrequently and such an opportunity is imminent in the Energy Independence Bill. This may be the last such opportunity within the timeframe set out in this paper. One option would be to include wording in this primary legislation, which would then enable regulations giving effect to a variant of the Existing RAB – SPV Model. Ashurst (a leading law firm) have provisionally proposed the following wording (noting it is repeated here on a non-reliance basis, and is subject to wider assumptions and context not set out in this paper):

If section 27 of the Planning and Infrastructure Bill is followed as a precedent, a new section could be added to the Energy Act 2023 – possibly a new section in Chapter 1 of Part 8 of the Energy Act 2023, covering the following points:

(a) *The Regulator must, as soon as reasonably practicable after this section comes into force, establish and operate a scheme in accordance with this section, designed for the purpose of encouraging the development of certain relevant heat networks.*

(b) *The scheme must provide for the holder of an approved relevant heat network (the "Eligible Heat Network Operator") to receive payments from a holder of a [gas transporter relating to the national transmission system] to cover specified amounts of the Eligible Heat Network Operator's assessed revenue in specified circumstances.*

(c) *In paragraph (b):*

  (i) *"approved relevant heat network" means a relevant heat network which is approved by the Regulator for the purposes of paragraph (b) in accordance with the scheme; and*

  (ii) *"specified" means specified by the Regulator for the purposes of the scheme in:*

    (A) *a document published by the Regulator, or*

    (B) *a condition of a licence or heat network authorisation;*

(d) *The Regulator may determine how costs and revenue are to be calculated for the purposes of the scheme.*

The test we specify above could then be defined either in the documents published by the Regulator or through secondary legislation, depending on the scope of the powers of an amendment.

Annex - Strawman Structure

A strawman structure is presented below, noting other structures are also possible. Elements of this approach have been discussed with Ashurst, who have provided advice on the required legal mechanism set out above, and Cory as a leading potential Strategic Heat Main developer.

1. Designated heat transmission projects would recover an agreed portion of their costs from licenced heat, gas and electricity networks for a designated geographical area. This mirrors an aspect of the Tideway funding structure, under which the project costs were put on the bills of Thames Water ratepayers, as well as how costs of failed energy suppliers are recovered.
2. The allocation of cost to consumer bills could be profiled over time, so that there could be a delay before the costs are added to bills and revenue via this mechanism is received – but there is upfront certainty that the cost / revenue will come against a pre-set timetable.
3. The Heat Transmission Developer takes finance for the Heat Transmission Project via debt and equity – repayments and distributions don't begin until construction is complete, with a potential repayment ramp up period. This financing is based on the energy network levy income stream, not heat sales income.
4. The Heat Transmission Developer develops the heat transmission & associated infrastructure.
5. Heat via the heat transmission infrastructure is initially sold without infrastructure funding costs included. Because waste heat is used and transmission costs are addressed separately, this is cheaper to consumers than gas. Because it is the lowest cost heat to consumers (and a long term supply option) widespread adoption is highly likely.
6. Subsequently, costs for the infrastructure funding are met by being included in heat network, gas, and electricity bills. While consumers bear this cost, it would be netted off against their energy savings from the lower cost waste heat. The goal of the structure is that consumer bills would be lower than in any counterfactual scenario, where an alternative new heating source was used, or the transition from gas was delayed.
7. An option for profiling the cost to the relevant gas network would reflect the shift of consumers from gas to the heat transmission system. E.g. if 60% of the relevant consumers in the area are on gas, 60% of the infrastructure cost remains on gas. Over time, close to 100% of the infrastructure cost would shift to heat networks.

8. Profiling the charges to the relevant electricity network could reflect: 1. system savings to the electricity system, by avoided grid connection charges. 2. ongoing benefits to the electricity system through peak load avoidance.

By separating the capital and heat costs, and providing revenue certainty for capital costs (in return for certainty of heat availability) this structure resolves the Supply / Demand Assurance Problem. The structure is laid out in the figures below.

Figure A: Contracts & statutory payment structure

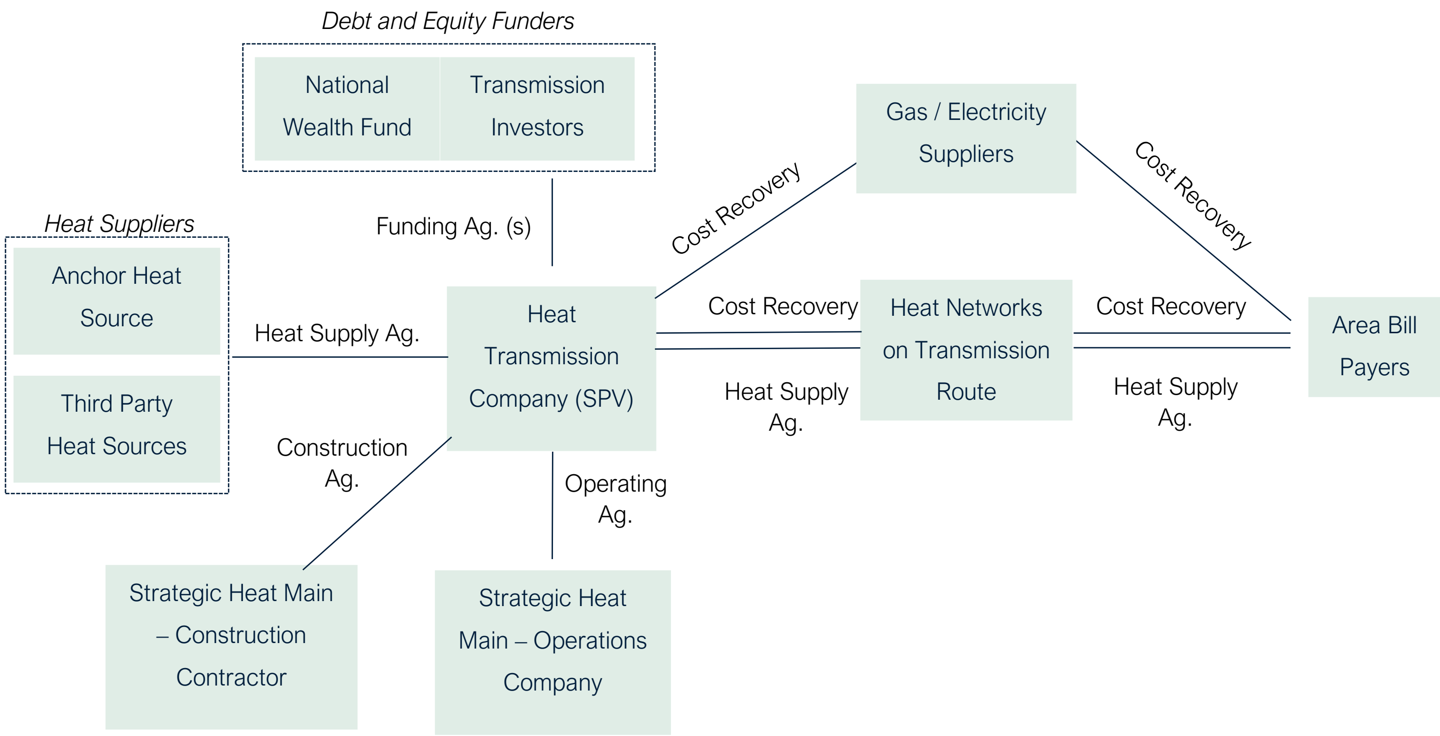

Figure B: Funds Flow – Construction Phase

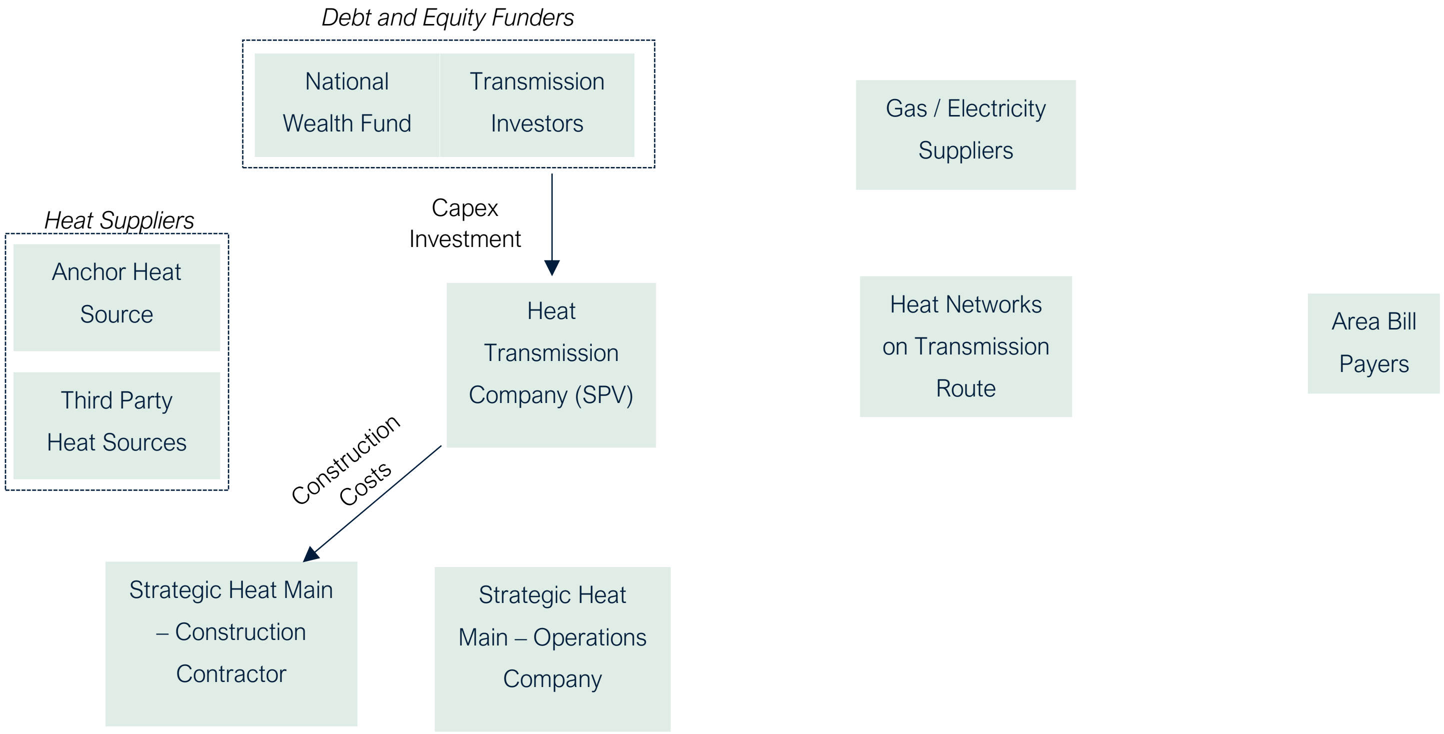

Figure C: Funds Flow – Operations Phase