Outline Business Case

Tottenham Hale / Wood Green District Energy Networks

London Borough of Haringey

RESTRICTED – COMMERCIAL IN CONFIDENCE

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Glossary of Terms

ADPBS	Assistant Director for Planning, Building Safety and Sustainability
ALMO -	Arms-length management organisation
AoA	Articles of Association
ASHP	Air Source Heat-Pump
BaU	Business as Usual
BEIS	The Department of Business, Energy & Industrial Strategy
BRS	Benefits Realisation Strategy
BWF	Broadwater Farm Estate
CAP	Climate Action Plan
CapEx	Capital Expenditure
CCAS-OB	Climate Change and Sustainability Officer Board
CCAS-OG	Climate Change and Sustainability Officer Group
CHP	Combined Heat & Power
CIL	Community Infrastructure Levy
CLS	Company Limited by Shares
CO_2	Carbon Dioxide
CPO	Compulsory Purchase Order
CSB	Customer Service & Billing
CSF	Critical Success Factors
D&B	Design & Build
DCO	Development Control Order
DEEP	Decentralised Energy Enabling Project (run by GLA)
DEN	District Energy Network
DEPO	Decentralised Energy Purchasing Organisation (Run by Stoke Council)
EC	Energy Centre
EfW	Energy from Waste
ELENA	European Local Energy Assistance
ERDF	European Regional Development Fund
ERF	Energy Recovery Facility
ESCo	Energy Services Company
FBC	Full Business Case
FIDIC	International Federation of Consulting Engineers works contract
GBER	General Block Exemption Regulations
GHG	Greenhouse Gas
GHNF	Green Heat Network Fund
GLA	Greater London Authority
GPR	Ground Penetrating Radar
GSHP	Ground Source Heat Pump
GWh	Giga-Watt Hour
HESCO	Haringey Energy Services Company
HfH	Homes for Haringey
HN	Heat Network
HNDU	Heat Networks Delivery Unit
HNIP	Heat Networks Investment Project
HoT	Heads of Terms
HP	Heat Pump
HRA	Housing Revenue Account
HV	High Voltage
IRR	Internal Rate of Return
JCT	Joint Contracts Tribunal works contract
kWh	Kilo-Watt Hour

kWTh	Kilo-Watt Thermal
LBH	London Borough of Haringey
LEAF	Local Energy Assessment Fund
LZC	Low or Zero Carbon
$MtCO_2$	Mega-Tonnes of Carbon Dioxide
MWh	Mega-Watt Hour
NEC4	NEC works contract
NED	Non-Executive Director
NLHPP	The North London Heat and Power Project
NLWA	North London Waste Authority
NOx	Nitrous Oxide Emissions
NPPF	National Planning Policy Framework
NPV	Net Present Value
NT	North Tottenham
O&M	Operations & Maintenance
OBC	Outline Business Case
OpEx	Operational Expenditure
PMO	Project Management Officer
PPP	Public-Private Partnership
PWF	Preferred Way Forward
PWLB	Public Works Loan Board
PWN	Private Wire Network
RIBA 2/3/4	Royal Institute of British Architects plan of work design stages
RPIx	Retail Price Index
RSA	Residential Supply Agreement
S106	Section 106 Agreement
SA	Shareholder Agreement
SC	Shareholder Committee
SIRR	Social Internal Rate of Return
SNPV	Social Net Present Value
SOLR	Supplier of Last Resort
SPV	Special Purpose Vehicle
StA	St Ann's
STPR	Strategic Transport Projects Review
TEM	Techno-Economic Model
TH	Tottenham Hale
ToR	Terms of Reference
UCR2016	The Utilities Contracts Regulations 2016
ULVOAPF	Upper Lea Valley Opportunity Area Planning Framework
VFM	Value for Money
WD	Woodberry Down
WEC	Woodward Energy Consulting
WG	Wood Green

Foreword

Haringey Council is seeking to deliver both a reduction in carbon emissions to tackle the climate emergency as well as ambitious housing and economic growth in the borough to support community wealth-building and the recovery from Covid 19.

The purpose of this Outline Business Case (OBC) is to examine and set out the results of potential Decentralised Energy Networks (DENs) in Wood Green and Tottenham Hale, as a means of delivering low carbon heat to the regeneration of the two areas. The infrastructure investment provides an economic stimulus and availability of low carbon heating infrastructure also facilitates housing and other developments.

The Tottenham Hale DEN and Wood Green DEN are two distinct projects, with separate funding requirements. These have been considered under one OBC as they have common resourcing and commercial requirements, especially when considering the commercial structure proposed and the resourcing required to progress them towards delivery.

The Executive Summary for this OBC has been developed as a separate document. Similarly, the appendices referenced have been submitted as separate documents.

This OBC has been completed to HM Treasury's Green Book standard (as recommended for major projects of this scale) and includes 5-cases.

- Strategic Case – make the case for change and to demonstrate how it provides a strategic fit
- The Economic Case – identify the proposal that delivers best public value to society, including wider social and environmental effects
- The Commercial Case – demonstrate that the preferred option will result in a viable procurement and a well-structured Deal between the public sector and its service providers
- The Financial Case – demonstrate the affordability and funding of the preferred option, including the support of stakeholders and customers
- The Management Case – demonstrate that robust arrangements are in place for the delivery, monitoring and evaluation of the scheme.

Section 1: Strategic Case

1. Strategic Background

1.1. Why Decarbonise?

1.1.1. Climate change is one of the greatest challenges facing mankind. In 2017, alongside other nations, the UK signed the Paris Agreement with the aim of limiting the global rise in temperature to 2°C (the increase where scientists advise impacts on humans are manageable). This commitment built on the already legally binding targets the UK had set itself in the Climate Change Act 2008 to reduce emissions by 80% by 2050.

1.1.2. In 2018, the United Nations International Panel on Climate Change announced that climate change was more advanced than initially thought and advised there were less than 12 years to achieve the necessary reductions in Greenhouse gases (GHGs) to stay within the 2◦C rise in global tempertures.

1.1.3. In 2019, Parliament voted to increase the savings required by the Climate Change Act to 100% and in doing so the UK became the first major economy to commit to a Net Zero target. At the same time, the Government commissioned the Climate Change Committee (the statutory body set up to advise and report on Government's progress in meeting the Climate Change Act) to consider whether the deadline of 2050 in the Climate Change Act could be bought forward.

1.1.4. Also in 2019, Haringey Council declared a Climate Emergency. The Council commissioned work on the Climate Action Plan investigating a deliverable and financially viable date by which date the borough could become Net Zero Carbon. In March 2021 Cabinet approved a the Borough Climate Change Action Plan with a target of being Net Zero Carbon by 2041. A key part of the Action Plan is to increase the generation and delivery of zero and low carbon energy to decarbonise our homes and businesses.

1.2. Why DENs?

1.2.1. Many of the solutions available to decarbonise our buildings are still under development and are not yet market ready (refer to Appendix A for further information and context). Therefore, the current UK thinking around the provision of Low Carbon Heat, as set out in the Heat and Buildings Strategy published in October 2021[1] "heat pumps will be a key technology for new buildings and buildings not connected to the gas grid, and heat networks will be a key technology in areas of high-density heat demand and where there are large low carbon heat sources". There is a growing consensus that low carbon heat can be supplied by two main categories of system:

1.2.2. **Installing individual Heat Pumps** – a heat pump can take ambient energy from the air, ground, water, or waste heat source, at a low temperature and upgrade it to be usable in buildings. They are electrically powered, and the air source heat pump (ASHP) version can be deployed in most buildings. However, they are both more expensive to install and more expensive to operate than gas boilers. Furthermore, mass roll out will require a major investment in the national grid (which will need to double in capacity).

1.2.3. **Installing Decentralised Energy Networks** (DENs) – Unlike ASHPs, DENs are highly location specific. The rationale for a DEN is that it brings the opportunities for scale to the doorstep of individual buildings that otherwise could not access said opportunity. For example, a DEN could tap into a body of water, or access multiple boreholes in the ground, or take heat from an Energy Recovery Facility, and ship it, via pipes buried into the ground to heat customers. If the heat sources are large enough and cheap enough, and the energy demand is sufficiently dense, it can be a cost-effective solution.

1.2.4. There is a recognition that heat networks are location specific and will not always be the right option. However, they have been identified as a 'low regrets' solution and government has provided extensive support, targeted at Local Authorities, over the last 5-10 years, to promote their growth.

[1] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1032119/heat-buildings-strategy.pdf

1.2.5. In addition, the National Planning Policy Framework obliges the Council to identify areas suitable for DENs. The London Plan identifies priority areas where DENs are expected to be viable and these cover most of Haringey. The London Plan also requires Boroughs to establish future energy infrastructure requirements and develop energy master plans, see also section 1.4.

1.2.6. Further information on DENs and the wider energy landscape can be found in Appendix A.

1.3. Benefits from DENs?

1.3.1. While DENs constitute large, complicated pieces of energy infrastructure, they have broad social, economic and environmental benefits, affecting a wide geography and numerous stakeholders.

1.3.2. The two main **environmental benefits** involve reductions in **carbon emissions** and improvements to local **air quality**. In terms of carbon emissions, Haringey currently relies on natural gas for around 85% of its heating needs. This needs to be eliminated if the worst impacts of Climate Change are to be avoided and to meet UK targets. The DEN can deliver energy that is very close to zero carbon, depending on the source. In terms of air quality: transport is responsible for most of the air pollution in London, but natural gas-based heating currently accounts for around 25% of emissions of nitrous oxide (NOx). While more modern gas boilers have become cleaner, the technical limits are now being reached and continued use of gas boilers will create a floor in NOx emissions which will remain as transport emissions are reduced. The DEN can deliver energy with close to zero additional air quality impacts, depending on the source.

1.3.3. From an **economic perspective**, the DEN is not expected to be more expensive (to the consumer) than the current high carbon alternative (gas boilers) and can be beneficial to the local economy. As with gas and electricity networks, much of the cost of the DEN is in the distribution network. Unlike traditional energy networks however, heat networks do not have an established customer base, where the expansion of the network is easier to accommodate, and costs/risks can be shared widely. For a DEN the initial investment required to connect customers is significant and the cost depends on the overall density of the scheme and how quickly the demand materialises in order to share the cost of the network. However, in other parts of the country, not too dissimilar to Haringey, well designed and structured heat networks have been shown to deliver low carbon energy in a cost-effective manner.

1.3.4. From a **social perspective**, while consumer protection issues need to be considered, a DEN can offer a local decentralised energy network, whose profits and growth opportunities bring greater benefit to the local community when compared to gas and electric networks where charges flow to areas remote from Haringey.

1.4. Markets and Policy

1.4.1. In the UK, around 4% of homes (400,000) are currently served by DENs although these are predominantly at building level. Unsurprisingly, these are concentrated in urban centres and rely heavily on natural gas. In Iceland and Scandinavia, the market penetration of DENs is around 50%.

1.4.2. Projections from Department of Business, Energy and Industrial Strategy (BEIS) and the Committee on Climate Change are that the market share will need to increase to around 20% if the UK is to reach its climate change targets and that networks will need to switch from gas to greener energy sources, predominantly waste heat from industry and other processes and naturally occurring heat from e.g. rivers, mines and, where geology is suitable, geothermal resources.

1.4.3. The UK Government, via BEIS, has been investing heavily in heat network projects over the last several years. This includes a revenue support scheme targeted at Local Authorities (via the Heat Network Delivery Unit, HNDU), which has delivered £12M over 7 years (including c.£600k to Haringey). Consecutive capital grants schemes (the Heat Network Investment Programme, HNIP, and Green Heat Network Fund, GHNF) which together commit >£500M to the heat network market over an 8-year period running to 2025, have also promoted growth.

1.4.4. The Greater London Authority (GLA) also provides (primarily revenue) support to DEN projects. One such source is the £6M Decentralised Energy Enabling Programme, DEEP, which has provided around £450k to Haringey, and its £3.25M successor Local Energy Accelerator, LEA. The GLA also made a recent £0.75M capital grant to Enfield Council to pay for increased capacity in its network which safeguards extension into Haringey and Hackney.

1.4.5. These schemes and others like them have created a buoyant Heat Network Market in the UK. Many of the big energy companies have heat network undertakings, and several high-profile energy companies from Europe, where heat networks have significant market share in the supply of heat, have also moved their heat network offerings to the UK.

1.4.6. There are large DENs in several London Boroughs and UK cities including Enfield (Energetik), Lewisham/Southwark (SELCHP), Newham/Hackney (the Olympic Park), Sheffield, Nottingham, Leeds, Coventry, Southampton and a variety of business models have been deployed in their set-up. Many of these schemes are led by the relevant Local Authority / Development Agency. Note this is exclusively the case where schemes serve multiple developments as is required in Haringey. A list of notable UK schemes is provided in Appendix B.

1.4.7. As a result of this growth, regulation of the market is changing. Following a market study into heat networks (conducted in 2018), Government has committed to introducing a heat network regulator and establishing a clearer market framework for heat networks. Government recently announced a forthcoming consultation on Heat Network Zoning which is essentially the creation of exclusive zones where (some or all) heat users are mandated to connect to a heat network. A wider Heat Policy Framework is also in the pipeline which will set wider policy for heat beyond heat networks. This will give greater clarity over how the costs of investing in heat networks (and other technologies) should be shared across society.

1.4.8. In the meantime, the National Planning Policy Framework[2] (NPPF) recognises the importance of heat networks and decentralised energy. For example, Paragraph 20 requires policies to set out an overall strategic vision for provision of energy (including heat) and Paragraph 151 requires Local Planning Authorities to provide a positive strategy to maximise deployment of low carbon heat.

1.4.9. Planning policy in central and inner London has been pro-heat networks since the London Plan was introduced in 2007. The heat network zone map (which can be found in Appendix B) from the new London Plan3 shows where new developments are required to install heat networks4, which also includes the vast majority of Haringey. The GLA has an extensive evidence base to support this which includes the heat density of London and the availability of waste heat.

1.4.10. In addition, the GLA's Upper Lea Valley Opportunity Area Planning Framework (ULVOAPF) identified the potential for a large heat network fed from the forthcoming Energy Recovery Facility (ERF) in Edmonton being built by the North London Waste Authority and set delivery of a heat network across the Lea Valley as an objective.

1.4.11. Haringey's own planning policy5, which needs to be in conformity with the London Plan, is also supportive of heat networks. Policy DM22 requires development in certain areas to be designed to connect to heat networks. The Council also uses planning conditions and obligations to support and promote DENs (and DEN connections) within developments, including mechanisms to generate connection payments. It also uses its planning obligations to get developers to provide infrastructure to support DENs (e.g. as at Clarendon Square in Wood Green where the developer is required to provide a DEN energy centre).

1.4.12. Haringey's evidence base for these policies includes the Decentralised Energy Masterplan6 which analysed opportunities for decentralised energy/heat networks in the borough. The Decentralised Energy Masterplan was funded and commissioned by the GLA and essentially links supply and demand. It shows that there is enough waste heat available from the forthcoming ERF at Edmonton to heat the tens of thousands of homes planned by Haringey's strategic planning policies. These findings were further supported by individual studies into North Tottenham, Tottenham Hale and Wood Green, all of which were funded by central government.

1.4.13. The rationale for intervention is set out in Figure 1.4-13 below.

[2] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/810197/NPPF_Feb_2019_revised.pdf
[3] https://www.london.gov.uk/what-we-do/planning/london-plan/new-london-plan
[4] Planning policy requires developers to install heat network across their development so that they can readily be connected to a larger network if that network comes forward. There are accompanying obligations requiring developers to connect to the network if it is shown to be commercially viable. The role of exploring the larger network between developments sits with the Local Planning Authority by virtue of the National Planning Policy Framework and (in London) the London Plan.
[5] https://www.haringey.gov.uk/sites/haringeygovuk/files/06_haringey_dmp_dtp_221215.pdf
[6] https://www.haringey.gov.uk/sites/haringeygovuk/files/160107_haringey_emp_report_rev7.pdf

Figure 1.4-13 - Rationale for Intervention

1.4.14. Further information can be found in Appendix B.

1.5. DEN Opportunity in Haringey

1.5.1. There are two complimentary opportunities in Haringey; growth in demand for green heat and several green sources of supply.

1.5.2. A significant source of heat is the North London Waste Authority's forthcoming ERF, which will produce enough low cost, low carbon heat to supply 60,000 homes. The proximity of the ERF to the demand highlighted below means Haringey is exceptionally placed to build a DEN.

1.5.3. In addition, there are several sources of affordable low carbon heat in close proximity to Haringey. including the River Lea and reservoirs, several tube ventilation shafts as well as scope to install specific low carbon plant such as CHP or air source heat pumps.

1.5.4. The density of heat demand in Haringey is high and, in some parts, the Borough is experiencing major growth. In particular, there are large pockets of heat demand which have been highlighted as being suitable for DENs. The six core areas in and around Haringey include:

1. Growth around the Tottenham Hotspur Stadium, High Road West and Northumberland Park in **North Tottenham**;
2. Growth in **Tottenham Hale** around Ferry Island, Ashley Road and Hale Village;
3. Growth in **Wood Green** initially focussed on Clarendon Square, the Chocolate Factory and several other schemes;
4. The recently refurbished and expanded heating system at the Councils' **Broadwater Farm Estate**;

5. An anticipated large heating system serving new homes and the remaining NHS facilities at the **St Ann's** Hospital in southern Haringey; and
6. The large regeneration scheme at **Woodberry Down** in Hackney.

1.6. Why should the Council Promote DENs?

1.6.1. Although the DEN market in the UK is buoyant, this is due primarily to local authorities responding to policy from central government (see1.4.6). In the absence of local authority action, there is a market failure around the delivery of DENs. While there is a need for low carbon heat, there is a missing market and there are no providers available to lead on assembling projects serving multiple developments.

1.6.2. This is because there is imperfect competition between DENs and traditional energy networks. The traditional networks have advantages conferred on them through their pre-existing scale, regulatory advantages (such as compulsory purchase powers and rights to install apparatus in the public highway) and due to the fact that the price of traditional energy sources does not fully include the cost of air quality and climate change impacts associated with their use.

1.6.3. In the absence of a regulated market framework and Heat Network Zoning, which government is currently looking at implementing, planning policy is the only real lever for delivering heat networks and local authorities are uniquely placed to promote DENs. However, even planning policy has some significant shortcomings because the delivery of large heat networks requires significant coordination across multiple developments to deliver infrastructure outside of the scope of an individual developer. This comes back to the market failure and the absence of DEN providers. If planning policy can require developers to connect to DENs, additional steps are needed to ensure a DEN provider materialises.

1.6.4. The Council has recognised this and in response to the shortcomings of planning policy and as a lever for implementing large DENs, there are additional commitments in the Borough Plan[7] and in the Climate Change Action Plan. The Borough Plan includes the following under the Place theme: *Lead on the delivery of an energy network where more sustainable energy is generated for use within the Borough & Explore setting up an alternative local or regional energy savings company(s) that would serve our community by helping to tackle fuel poverty.*

1.6.5. The borough's Climate Change Action Plan8 includes commitments under Objective E3 to deliver business cases for the Wood Green and Tottenham Hale DENs and, subject to viability, progress the schemes through commercialisation in 2022 and move to operation in 2024.

1.6.6. Obligations on Local Planning Authorities through the NPPF and Boroughs through the London Plan place the emphasis on the Council to coordinate creation of opportunities for large heat networks.

1.6.7. The Council is well placed to create the supportive strategy required by the NPPF by, for example:

- committing to buy energy from a network,
- offering Council land to house key assets,
- using wider powers (e.g. compulsory purchase and powers to install apparatus in the public highway) to support delivery,
- using planning obligations to ensure wider connectivity,
- committing Strategic Community Infrastructure Levy and s106 funds and
- providing access to wider government financial support for investigating heat networks.

This places the Council in an exclusive position to lead on the creation of DEN opportunities. By combining its role in planning policy with its wider powers and its ability to have a long-term view and bearing in mind it will be managing DENs on its own large development sites and existing Council

[7] https://www.haringey.gov.uk/sites/haringeygovuk/files/borough_plan_2019-23.pdf
[8] https://www.minutes.haringey.gov.uk/documents/s115041/Appendix%201%20Haringey%20Climate%20Change%20Action%20Plan%20-%2026-02-2020%20Clean.pdf

housing estates, the Council is well placed to promote and grow DENs and ensure that the associated benefits are realised.

1.6.8. Without a coordinated approach these new developments, which include the Council's own new Council housing developments, will develop plot by plot solutions. These are expected to have high life cycle costs to end users and the opportunity to create a cost-effective decarbonised district heat solution will be lost.

1.6.9. By taking an active interest in the set-up of DENs, the Council can ensure:

- schemes are developed in a way that take into account the Council's strategic priorities
- that energy infrastructure is put in place which is expected to be considerably lower cost than alternative methods of decarbonising heat leading to lower energy costs for local residents and businesses in the long-term
- in addition, that residents most in need will have additional protections
- that commercial arrangements ensure checks and balances are in place on monopoly heat suppliers (prior to the government introducing regulation)
-

1.6.10. A more active role in delivery would give the Council even more control over delivery of the benefits set out in 1.6.9.

1.6.11. Please refer to Appendix B for further information.

1.7. Why Now?

Borough-wide Timing Opportunities

1.7.1. The Council declared a Climate Emergency in 2019 and published a borough Climate Change Action Plan (CCAP). This gives an urgency to carbon saving projects. For the DENs, the CCAP included a target to deliver OBCs by Summer 2021, then, subject to viability, complete commercialisation in 2022 and start supplying energy in 2024.

1.7.2. The Council has built up a significant latent demand for heat in buildings which are currently under construction or about to start on site through its planning policies. These require private developers to connect to DENs if the projects materialise and make a reasonable commercial offer to the developer. However, it is easier for the Council to make a commercially viable offer to developers while sites are under construction and the planning agreements with some large customers expire in the near future. If the Council does not move now, the customer base begins to evaporate.

1.7.3. There is a government capital grant programme, the Heat Network Investment Project (HNIP), which can provide significant grant funding to the Projects as well as subsidised, almost zero interest loans (the subsidy in the loan is equivalent to a grant – see 2.12 for more detail). HNIP is accepting applications until October 2021. Projects need to demonstrate feasibility when applying but then need to demonstrate further progress in commercialisation to draw down funds by March 2022. While HNIP will be followed by the £190m Green Heat Network Fund (GHNF) starting in April 2022, this is likely to be too late to deliver the projects as set out in this report. However, it may provide an opportunity to deliver further extensions.

1.7.4. Enfield Council, with funding secured from HNIP, is also now starting to build out a DEN from the waste facility in Edmonton to serve Meridian Water and Enfield council housing sites around Fore Street. The Mayor of London has provided additional funding to ensure this system has capacity to supply Haringey and Hackney. This significantly reduces the risk over where Haringey would source a long-term low carbon heat supply from and allows the Council to move ahead more confidently with its DEN programme.

Tottenham Hale Timing

1.7.5. In Tottenham Hale, the Council has entered into numerous planning agreements with developers since 2017. Most of these developers have since commenced construction of their schemes.

1.7.6. The planning agreements were put in place following feasibility work in 2016 which showed a DEN was feasible. These agreements see the developments as customers of an area wide DEN and

commit the Council to making offers (to the developers). However, the offers will be more commercially attractive if they can be concluded before the sites are complete. From a practical perspective, it is clearly better to install the DEN infrastructure before these sites are complete to avoid having to dig up the brand-new public realm. However, this will require relatively high spend on enabling works. This will be at risk as they will be installed prior to a decision on the deliverability of the wider scheme.

1.7.7. Central government HNIP funding is on offer and the TH scheme is eligible for significant funding (indeed, an application has been made based on the project described in this OBC and a time-limited funding offer is now on the table – see sections 4.3 and 5.7 for more detail of the funding.

Wood Green Timing

1.7.8. In Wood Green, the Council has entered into a planning agreement with St William, developer of c.1,800 new homes at Clarendon Square. The development agreement requires:

- St William to provide an Energy Centre (a building to house a central DEN plant) to the Council;
- The Council to make a final offer to St William to supply the Clarendon Square site from the energy centre by October 2022;
- If the Council is to hit this date, considerable work needs to be done to finalise the business case and that work needs to start now.

1.7.9. The planning obligations described above were implemented in 2017 based on early feasibility work for the DEN. This OBC updates the feasibility for progressing the DEN in Wood Green. However, there is still substantial commercialisation work to be done to develop the feasibility work to the point where the Council can make a final offer to St William. A decision is needed now on whether to proceed with the Council DEN scheme to the next stage in order to be able to progress the commercialisation work.

1.7.10. The Council has similar planning agreements with other developments in Wood Green (most of which are not yet on site). These agreements envisage the sites would be customers of the DEN. There are similar commitments on the Council to make offers to these sites although the timeframes are longer.

1.7.11. The Council is potentially developing a new headquarters in Wood Green to rationalise its operational buildings. The new HQ is a potential customer of the DEN and could help address Council commitments to green its portfolio of operational buildings.

1.7.12. A successful HNIP application has also been made for the Wood Green DEN (based on the project described in this OBC) and this offer is time-limited. See sections 4.3 and 5.7 for more detail of the funding.

1.7.13. While there is an option to extend the network further to St Ann's and Woodberry Down, no firm plans exist for implementing such an extension and this business case does not consider connecting them other than to highlight the opportunity. There are a variety of ways that project could be set-up and a separate business case would be required. Scope of the Projects

1.7.14. This Outline Business Case (OBC) aims to assess the case for change and develop the first two phases of a large Decentralised Energy Network (DEN) in Haringey (the "Projects"). These Projects are concerned with delivering affordable low carbon heat to homes and businesses in Haringey and form part of an ongoing Council programme of DENs. The two projects being presented under this OBC are Tottenham Hale (including Broadwater Farm) (TH); and Wood Green (WG).

1.7.15. While HNIP bids have been submitted with defined scopes and proposals to use the ERF as the low carbon heat source (as described in this OBC), the starting position for the two projects was to consider all potential scopes and options for sourcing heat.

1.7.16. The **Tottenham Hale (TH) DEN** is developed around the redevelopment of Tottenham Hale, undertaken by Argent and includes neighbouring sites along Ashley Road with Berkeley Square Developments, Notting Hill Genesis and the Council itself. There is a requirement that these developments are future proofed for DEN delivery. Many of the technical requirements to deliver this have already been secured through the planning process. The TH scheme is also close to Broadwater Farm (BWF) where the Council recently invested £12m on refurbishing and growing its

existing community heating network[9]. There is potential to link the two neighbourhood schemes together. Various heat sources are available including CHP, ground, air and water source heat pumps and the ERF. Maps showing the TH site can be found in the Economic Case 2.18.2, The Tottenham Hale DEN, Figure 2.19-1.

1.7.17. The **Wood Green (WG) DEN** is developed around the Clarendon Square development undertaken by Berkeley Group. In addition to this, there are developments underway on the Chocolate Factory site, Iceland site and Petrol Filling Station Site. There are also new Council offices planned in the area and the potential improvement and redevelopment of the library and potential to connect the iconic Alexandra Palace to the scheme supplementing the iconic building's existing boiler systems. As in TH there will be a requirement that these developments are future proofed for DEN delivery. Many of the technical requirements to deliver this have been or will be secured through the planning process. Various heat sources are available including CHP, ground, air and water source heat pumps and the ERF. Maps showing the WG site can be found in the Economic Case, Section 2.31, The Wood Green DEN, Figure 2.32-1a.

1.7.18. Both the physical scope and commercial scope of these neighbourhood DENs need to be considered, bearing in mind they are anticipated to form part of a larger network serving an area across eastern Haringey and connecting into adjoining boroughs as indicated in the Decentralised Energy Masterplan. It is therefore important to consider opportunities and risks associated with the four other neighbourhood scale DENs, namely **North Tottenham (NT), Broadwater Farm (BFW), St Ann's (StA) and Woodberry Down (WD)**. This has been considered in the Economic Case**.**

- **North Tottenham** – An OBC for a heat network was approved by Cabinet in January 2017[10] for regeneration focused around the High Road West area. This is moving forward again now that funding issues are being resolved.
- **Broadwater Farm** – The BWF Estate district heating scheme currently serves 937 existing homes across 11 blocks and two schools. One of the high-rise blocks is to be demolished which will reduce the load to 835 homes and two schools, but redevelopment of the estate will see the Council add approximately another 350 new homes to the system over the next 5 years.
- **St Ann's** – this regeneration project at a former NHS hospital site for new homes, will be implementing a DEN (to include neighbouring NHS buildings where viable).
- **Woodberry Down** – this scheme in Hackney is one of the largest regeneration projects in London. Berkeley Homes has already built over 2,000 new homes and anticipate completing 7,000 homes by 2040. The homes built to date are in blocks of flats heated by communal systems and are required to connect to a development wide DEN from 2025.

1.7.19. The Commercial Case and Management Case will consider how the two projects at TH and WG fit with the Council's wider DEN projects at NT, BWF and the new HRA properties.

1.7.20. When considering the scope of the DENs the key questions posed are scale, phasing and structure. For example, do Haringey: Form a DEN in a single neighbourhood and seek to grow outwards from there; or Form several DENs in different neighbourhoods, aiming that eventually they will all interconnect; or Form a single DEN covering the majority of the Borough from day one. Based on the answer, how is the build phased and funded and what commercial structure(s) and delivery vehicle(s) should be deployed?

[9] https://www.minutes.haringey.gov.uk/mgAi.aspx?ID=58353
[10] https://www.minutes.haringey.gov.uk/ieListDocuments.aspx?CId=118&MId=7849

1.8. Project Objectives

Table 1.8- Project Objectives

Project Objectives
1. Viability – to maximise income and minimise cost and risk so that the scheme is affordable (to investors) / investible and financially sustainable.
2. Leadership – to demonstrate the Council's ambition and leadership in reducing carbon emissions from new and existing buildings in Haringey in line with the Climate Emergency, emerging Climate Action Plan, Borough Plan, planning policy and wider national and international policies.
3. Customer First – to provide a. energy at a fair price[11]; and b. deliver excellent levels of customer service and customer protection.
4. Programme – to minimise disruption to residents and the local community and avoid clashes with concurrent delivery programmes.
5. Community Engagement – to engage with and get buy in for the project from the local community and developers as well as building trust in the Council to deliver low carbon infrastructure in support of community and developer needs
6. Community Wealth – to provide a stimulus to the local economy by retaining wealth locally, building the local supply chain and by providing job opportunities throughout construction and operation.
7. Capacity Building – to act as a catalyst for the development of further decarbonisation projects in the Borough through in-house capacity and knowledge building.

1.8.1. The priority given to different objectives is important where objectives are not fully aligned or even in opposition. For example, Viability is enhanced by setting the price of energy sold to customers to be higher, whereas Customer-First, encourages lower prices. The objectives will prioritise Viability because Customer-First will not benefit if their supplier goes bankrupt. However, there is clearly a tension between the supply business' profits and costs for customers that will need to be considered throughout the OBC.

1.8.2. A DEN's ability to gain customers will be critically affected by its prices which must be affordable. What is affordable is likely to be set by reference to wider energy markets and so this will act to place a limit on charges. This issue and additional red lines, in the form of Critical Success Factors, are discussed in the section 2.2.

[11] A 'fair price' means certainly no higher than the price of a realistic alternative heating system – see Critical Success Factors in the Economic Case – or if the scheme is sufficiently profitable, prices will be reduced to share benefits with customers

1.10. Impacts expected

Benefits being sought

1.10.1. The table below sets out the primary quantifiable benefits from the project and how these can be measured. No particular targets have been set at this time as these will be informed by the specifics of the projects and revisited in the Benefits Realisation Plan in Appendix C.

Table 1.10-1 1 Project Benefits

Objectives	Main benefits by stakeholder group / customer
1 Viability	Viability can be measured by examining the post-tax, post-finance revenues from the projects. The beneficiaries are the investors in the project (and, of course, none of the other objectives can be achieved if the project does not proceed)
2 Environmental	Quantifiable environmental benefits from the projects include carbon and NOx emissions reductions both of which can be determined by calculating the emissions that gas boilers would have produced. Local air quality improvement should also be measurable although local air quality is dependent on numerous factors. The general public benefits from carbon emission reductions and residents of Haringey will benefit from improved air quality.
3 Customer First	Customer protection can be measured through a variety of means including: • Benchmarking of costs against conventional methods including specifically considering costs faced by customers most in need; • Compliance with Heat Trust requirements over consumer protection; • The level of complaints and compensation paid to customers • Lower levels of service interruption/high levels of fault rectification; and • Surveys showing above average levels of customer satisfaction. Customers, and residential customers in particular, benefit from these areas. There are also reputational benefits for the scheme.
4 Programme	It is difficult to evidence how well the projects avoid clashes with other ongoing developments and the extent to which the projects manage to minimise disruption. However, other projects will be unwilling to engage with the projects where there are clashes (and so successfully acquiring customers from ongoing developments can be considered a proxy for this). In terms of disruption, properly factoring in disruption to analysis of options for installing pipes (e.g. via cost benefit analysis) can help to minimise this (although the benefits quantified here will be based on assumptions in the assessment methodology). Any development will be required to comply with various statutory requirements and monitoring compliance with these restrictions provides further measurable criteria.
5 Community Engagement	There are various techniques to monitor the effectiveness of community engagement through e.g. monitoring numbers of attendees at events, demographic analysis of participants and surveys of residents to understand e.g. levels of trust, extent to which issues are understood, representativeness etc. It is society in general that benefits from improved engagement as it should help lead to better project implementation and less conflict with stakeholders.
6 Community Wealth	Community wealth impacts which can be measured include: • Number of apprenticeships during construction • Creation of additional jobs • Proportion of turnover which is in-sourced • Closer working between supply chain and local schools/community groups The benefits flow primarily to residents in Haringey
7 Capacity Building	Evidence of capacity building includes: • Continuing investment and growth of the DENs and investment in other energy projects • Number of employees with professional membership of energy or engineering institutes • Recognition in energy project awards The Council is the primary beneficiary from a more skilled work force but also creates opportunities for local workers.

Other impacts

1.10.2. Constructing the DEN will lead to disruption around the energy centres in Tottenham Hale and Wood Green. However, the most disruptive aspect of the project arises from works to install the network in the highway, which will affect road users, residents and businesses along the route of the network.

1.10.3. These negative impacts are captured via the objectives around 'Programme' (where there is an objective to minimise disruption) and 'Community Engagement' (where there are goals to consult properly and build trust with stakeholders).

1.11. Inter-Dependencies, Assumptions & Constraints

1.11.1. The analysis in this report is interlinked with several other projects and wider policy.

1.11.2. The Projects rely on supplying energy to a mix of existing buildings and new developments. Many of these sites are controlled by the Council or have planning obligations to connect and buy energy if a commercially viable offer is made. It is assumed that the offer set out in this business case, which is in line with the terms agreed at other similar schemes, is viable and so the Council and new build schemes will connect on those terms.

1.11.3. It is also assumed that the development sites identified in the business case will come forward. The assumed quantum and timing of development has been estimated in conjunction with colleagues in regeneration and planning and sensitivity analysis has been conducted to understand the risks.

1.11.4. The detailed development programme along with individual sites is explained in more detail in the Economic Case.

1.11.5. It is assumed that the North London Waste Authority's ERF will be delivered on programme and will supply heat to the DEN via Enfield Council's Meridian Water scheme on terms set out in this report (which have been informed through discussion with Enfield Council whose negotiations with NLWA are well progressed).

1.11.6. Planning policies including the National Planning Policy Framework, London Plan and Haringey's own development framework are also supportive to the project as are current Building Regulations. It is assumed this will continue or become more favourable to DENs (e.g. through the implementation of Heat Zoning, a clearer market framework and market regulation).

1.11.7. It is also assumed that a level of financial support for DENs will continue to be available from central government, e.g. HNIP and the Green Heat Network Fund, whose role it is to promote the growth of DENs and drive the UK towards Net Zero Carbon.

1.12. High Level Risks

1.12.1. Below are the key thematic risks associated with these projects.

Table 1.12-2 - H/L Risks

Risks	Mitigation
Not Achieving Environmental and Financial Targets	Due diligence and risk analysis of projects
Large upfront unpalatable capital investment	Apply for central government grants where possible
Impact of implementing large disruptive projects	Coordinate with Council's works masterplan
Missing key strategic opportunities	Strong leadership and decision making
Inadequate resource to deliver on ambitions	Build in resource requirements into OBC
Taking on roles the council is unfamiliar with	Internal or external development of competencies required
Delays in decision making	Clean and uncomplicated governance
Cost & Programme Overrun	Strong PMO team to manage the project
Reputational Impact	Stakeholder engagement & clear definition of roles and risk

Section 2: Economic Case

2.1. Purpose of Economic Case

2.1.1. The Economic Case covers optioneering to select a preferred way forward from a longlist of options. The document sets out the evidence-based assessment, risk and sensitivity analysis undertaken to arrive at a recommended preferred option for the scheme. The preferred option will then be developed in the later cases (Commercial, Financial and Management) which set out how the preferred option can be delivered.

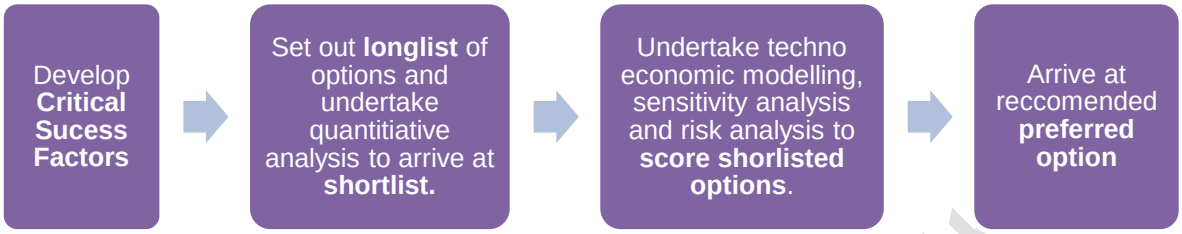


Figure 2.1-1 - Longlist to Preferred Option Process

2.1.2. The process of developing the technical solution is set out in Figure 2.1-1 above.

2.1.3. The content of this case assumes a basic understanding of technical issues around the design of DENs. Less technical readers are advised to first read Appendix A.

2.2. Critical Success Factors

2.2.1. A list of Critical Success Factors (effectively red lines for the project) was developed by officers, covering all key aspects of project deliverability relevant to heat networks and reflecting the project's objectives. The purpose of Critical Success Factors (CSF) is to provide a structured and transparent method for assessing the various options.

Table 2.2-1 - Critical Success Factors (CSFs)

	Critical Success Factors
1	**1A** The scheme must ensure **no customer detriment** vs. alternative heating systems in terms of price, quality of service and consumer protection. **1B** The commercial set-up and ongoing management must be **robust** to ensure the **standard of service** is maintained at a **high level**.
2	The scheme must have a clear strategy for providing an **affordable, secure, low carbon supply of heat** in the short, medium and long-term.
3	The project must meet all investors' **internal hurdle rates** and risk appetites (the precise rates/appetites TBC) but will be a return on investment commensurate with the level of project risk; grant funders will require sufficient confidence that a suitable **benefit to society** will arise to warrant grant funding.
4	The scheme must be sufficiently attractive to developers and customers to ensure connection and agreement of long-term supply contracts and **future growth of the scheme** (bearing in mind planning and other policies can be assumed to provide an onus to connect).
5	Scheme delivery must be **within the constraints of the wider development programme and be implemented with manageable levels of disruption** to concurrent delivery projects.
6	The project must be implemented in a way which is consistent with the Council's internal standing orders and policies and be lawful including: a. The operation of the scheme must fall within the **required noise and emission limits** and cause minimum disruption to the wider community. b. The project must be set up and **procured in accordance with the Council's procurement strategy and policies** on community wealth generation, social value, insourcing, etc.). **The community must have the opportunity to input at various stages.** As a minimum this will be in line with statutory/regulatory requirements for consultation e.g. from planning & housing management services and on Key Decisions taken by the Council but also as part of the voluntary consultation on the Climate Change Action Plan.

	Critical Success Factors
7	**Project risks** must be clearly identified (and quantified where possible) and a robust risk management process must be followed to mitigate risks and keep them within an acceptable level.
8	A **clear exit strategy** must be available to the Council, at all times.

2.3. Long List

2.3.1. To establish a longlist of technology options, we need to define the key characteristics of the schemes we will evaluate.

2.3.2. DENs have a number of key parameters which shape the network. The ones relevant to Tottenham Hale (TH) and Wood Green (WG) are as follows:

- Network Extent;
- Low, Zero Carbon Technology type;
- Energy Centre Strategy;
- Network Capacity; and
- Network Route

2.3.3. Each of these parameters in turn have a number of configurations, which result in several hundred scheme permutations. It is not practical or efficient to consider all possible scheme permutations, so each is reviewed in relation to the scheme, including or excluding options to narrow down the number of permutations that will be shortlisted.

2.3.4. This section outlines the parameters which are relevant for both TH and WG and in turn set out the rationale for excluding or including some options over others. The retained variables are then shortlisted and taken forward for further detailed analysis.

2.3.5. Scheme specific variables for each network are discussed in Sections 2.17 and 2.30.

2.4. Network Extents

2.4.1. The network extent sets out the ambition and scale of the network. It influences the number of customers, and subsequently the amount of heat (and power) sales and volume of benefit the scheme can deliver.

2.4.2. For both TH and WG, officers in planning, housing, regeneration and related areas were contacted to identify sites viable for connection to a heat network. These officers also advised on the likelihood of a scheme progressing and associated risks. The selection of sites focussed on newbuild developments and large existing buildings with heating systems that could easily be connected to the DEN as potential customers.

2.4.3. Note that while connecting small residential buildings, such as terraced or semi-detached homes, is technically possible, it is cost-prohibitive to do so and so these sites have been ruled out.

2.4.4. Similarly, the viable network extent with respect to larger customers is dependent on cost effectiveness of connection. This in turn is affected by the cost of producing heat and connecting customers. While the cost of connecting customers is similar for all heat sources, the cost of supplying them varies and so the network extent will differ depending on choice of heat source which is discussed in the next section.

2.5. Low, Zero Carbon (LZC) Technology

2.5.1. As DENs are built to be low carbon, an LZC technology will be the lead source of heat supply although this will be backed up to a degree by other plant which may be higher carbon.

2.5.2. There are a number of LZC technology options, each with differing characteristics in terms of fuel/energy source, costs, revenues, performance and environmental benefits. Some of the relevant options to TH and WG are:

- CHP (Combined Heat and Power) using natural gas or biomass

- EfW – Energy from Waste from an ERF (Energy Recovery Facility) making use of unwanted heat
- Heat Pumps – electrically powered systems taking ambient heat and upgrading it to be useful in buildings. The ambient heat could come from:
  - Ground or Water Open Loop configuration (where water is taken from the ground/water body, heat is extracted and the cooled water is then returned to the source)
  - Ground or Water Closed Loop configuration (where water is circulated over and over)
  - Air Source Heat Pump (which takes energy from the air)

2.5.3. Detailed information on the relative advantages and disadvantages of each technology is summarised in Appendix R.

2.6. Energy Centre Strategy

2.6.1. There are three main options in selecting a preferred Energy Centre (EC) strategy, which also has a direct impact on the network strategy (as the network needs to be sized to *at least* match the output of the EC). These options are:

- Number and Location of Energy Centres:
  - To have a single centralised energy centre; or
  - multiple distributed energy centres, including locating plant on customer sites.
- Type/reliability of Heat Generation at each location
  - Baseload heat: The baseload is the consistent amount of heat needed by the users of the DEN. Typically this makes up the majority of the annual heat demand and is supplied from LZCs, which as well as being greener, typically have a lower operating cost. Often supply of baseload heat is increased by combining LZC plant with thermal storage (storage of hot water) which allows the LZC plant to deliver a greater share of the demand by storing energy produced at times when demand is low for use at a later time.
  - Peak heat: The peak is the instantaneous maximum heat demand during a year. Typically, gas boilers are used to meet this peak demand as they are not needed all the time and are relatively cost effective and space efficient to install. These boilers also provide back-up to the LZC to improve resilience (as does provision of spare boilers).
  - Further information on baseload and peak demand heat can be found in Appendix D
- Phasing and location
  - How the EC(s) is (are) built out (is an initial oversized building provided and then filled up with plant in phases or are new ECs added as new customers connect?) is linked to the expected size of the network and when new loads come online. There is a balance between up-front cost and risk.
  - Location of the base load (LZC) and peaking plant (gas boilers) is a key consideration for the EC strategy and has a knock-on effect on the network extent and routing.

2.6.2. The EC strategy (detailed in Appendix D) is generally to minimise the up-front space that needs to be funded by the project to minimise upfront capital cost. Generally, LZC and thermal storage plant will be centralised to benefit from economies of scale and sized to ensure the LZC meets most of the annual heat demand (70 to 95% ideally). The remaining peak heat capacity and resilience needs shall be met by gas fired boilers but these may be distributed in several ECs.

2.6.3. The number of ECs and their locations varies from scheme to scheme and option to option. There are some economies of scale from centralising but these are not as strong as with LZCs and so the number of locations for peak plant will tend to be higher. Generally the recommended strategy is to size the initial energy centre to provide the peak capacity of the initial scheme only. Subsequently, and as the DEN grows, the strategy will be to utilise new additional ECs or retain existing plant as sites connect to provide additional generation capacity via smaller satellite ECs, which will meet local peak demand when required. While this is less optimal from an economic and operational perspective, it minimises risk.

2.6.4. Note that in Wood Green, a developer is required to provide a single large EC on behalf of the DEN and so the recommended strategy is to take advantage of this single large energy centre as the obligation on the developer takes the cost/risk away from the DEN project.

2.7. Network Capacity

2.7.1. The pipe diameter determines the capacity of the network to deliver heat. Larger diameter pipes can deliver more hot water and therefore more heat. However, larger pipe is more expensive to install, operate and replace so the network capacity must be optimised between cost, providing flexibility and the future capacity to expand.

2.7.2. Pipework for both networks shall be sized from day one to serve all the sites identified to connect in the short, medium and long term. The pipes shall also be sized according to the EC strategy e.g. if local gas boilers are available to meet peak demands on a development, then the pipe up to the site shall be sized to only meet the baseload demand. This will mean that the pipework to the site is at an optimised size reducing upfront capital costs.

2.7.3. Whilst the network capacity developed during the initial design stages are based on expected sites, there is flexibility to adapt the network (within limits). Changes to operating temperatures or flow rates will be accommodated by oversizing the pipes in the early stages, becoming more defined as the project progresses.

2.7.4. This approach minimises cost by providing flexibility for the future build out and allows the network and EC strategy to adapt to an expanded scheme in a cost-effective manner.

2.8. Network Routes

2.8.1. The network route needs to be carefully considered to ensure the schemes are as efficient and cost effective as possible. Final routing is influenced by several factors, a lot of which is determined in the detailed stages of project development. These factors include site surveys and ground investigations which will help identify what is installed below the surface.

2.8.2. For this OBC the network routes will be developed to an outline design stage, in order to ascertain reasonable cost estimates for connecting selected sites. This routing will be based on:

- Making the most efficient connections from the EC to the buildings and minimising the network length;
- The use of existing roads and pathways where public ownership enables development;
- The use of landscaped / pedestrian areas to reduce disruption to transport routes and allow lower cost installation; and
- The use of minor roads where utility congestion may be reduced and where traffic disruption can be minimised.

2.9. Methodology for Shortlist Options Analysis

2.9.1. Following consideration of the five parameters above, three main heat network options were developed for TH and three for WG (although there are some sub-options in TH). The shortlisted options for each neighbourhood were analysed using a combination of qualitative and quantitative assessment criteria as set out below.

2.9.2. As well as the heat network options, 'Do Nothing' or counterfactual[12] scenarios were also developed as a comparator. See Sections 2.24 and 2.37 for more details of these options. The following sets out how the options were assessed, leading to a preferred way forward.

2.10. Techno-Economic Modelling (Quantitative)

2.10.1. A Techno-Economic Model (TEM) was developed for each network. A TEM is a model that combines the technical solution with economic performance and uses inputs such as projected build out, system performance, capital costs and operational costs. It combines financial and

[12] Counterfactual simply means the thing that would have been expected to have happened if we did not implement the project.

environmental performance to produce economic metrics allowing comparison of options against the 'Do Nothing' scenario and each other.

2.10.2. A table containing a full list of inputs to each TEM is included in Appendices E and F, along with a table presenting the capital cost breakdown for all options considered.

2.10.3. The key economic metrics provided by the TEM are:

- **Net Present Value (NPV)** – the yield of the investment based on the capital, costs and returns over time, together with the discount factor.
- **Internal Rate of Return (IRR)** – the internal rate of return on the investment. The IRR is equivalent to the discount rate that would be applied to a series of cashflows to obtain an NPV of zero.
- **Social Net Present Value (SNPV) –** As per NPV but including the notional monetisation of non-cashable impacts. In this case the Air Quality impact and Carbon savings.
- **Social Internal Rate of Return (SIRR)** – As per IRR but including the notional monetisation of non-cashable impacts.

2.11. Boundaries in Economic Analysis

2.11.1. The boundaries set out the perspective that the project is assessed from, and what benefits and charges are to be quantified in the project's cashflow. Some of the impacts of the project result in a benefit to one group and an equal cost to another. If both of these groups are within the boundary under consideration, the impacts cancel one another out. However, if the analysis boundary is shifted to exclude one of the groups, the perspective of the project will shift.

2.11.2. An example is grant funding. If looking at the project from a UK perspective, a grant from national government is income to the project, but an equal and opposite cost to society which cancels it out. However, if we set the boundary to be Haringey, the grant is still seen as income to the local area, but the cost borne by the rest of the UK is no longer considered within the analysis as a factor meaning a grant from national government is a net benefit.

2.11.3. Table below sets out the main benefits and charges arising from the DEN project, and how they can be evaluated at the three main boundaries.

2.11.4. The Economic analysis undertaken for the OBC has been undertaken at the project level for the NPV, IRR, Social NPV and Social IRR calculations.

Table 2.11-4: Boundaries in Economic Analysis

Benefit / Charges	Boundaries		
	Project	Haringey	Society / UK
CIL (Community Infrastructure Levy): *Haringey to Project (Local Transfer)*	Included	Transfer	Transfer
HNIP (Grant Funding): *UK Gov to Haringey (National Transfer*)	Included	Included	Transfer
Private Wire Network/Levy Avoidance: *National Grid to Haringey (National Transfer)*	Included	Included	Transfer
AQ Benefits: *Direct benefit from project*	Included	Included	Included
Carbon Emissions Benefits: *Direct benefit from project*	Included	Included	Included

2.12. Grant Funding - Heat Network Investment Project (HNIP)

2.12.1. Grant funding is a critical economic variable in assessing the viability of the options. Heat networks are significant long-term capital investments where the costs are often front-loaded onto initial phases with benefits back loaded onto future growth. This can create a funding gap for the initial phase which requires some level of grant to make initiating the project an attractive investment.

The Department of Business, Energy and Industrial Strategy (BEIS) runs the HNIP scheme which offers gap-funding grants (and loans[13]) to heat network projects.

2.12.2. HNIP has a number of initial eligibility criteria and pass/fail tests which an HNIP funding application is tested against:

I. The pre grant 40-year IRR must be positive (above 0.00%).

II. Total grant funding must be less than 50% of the total eligible project costs.

III. The awarded level of grant must not breach UK state aid funding limits[14].

IV. HNIP apply a ceiling on funding so that projects are not over-rewarded to generate a return to investors above a certain level (which is kept confidential by HNIP).

2.12.3. In addition, there is a cost-effectiveness test that is applied to applications. HNIP is awarded based on how effective the HNIP funding is in delivering carbon savings and high volumes of low carbon heat. A request for a larger grant will improve the scheme IRR but will reduce the cost effectiveness score and thus likelihood of being awarded a grant. HNIP has provided guidance as to the cost-effectiveness they expect projects to achieve.

2.12.4. The majority of options we are assessing will be eligible for HNIP funding. It is assumed that where an option is eligible for HNIP funding, some will be forthcoming (although the risk of the funding not arising is assessed).

2.12.5. In modelling the projects to seek to assess a suitable funding amount to include, the critical factor is the cost-effectiveness issue highlighted in paragraph 2.12.3. Where projects are assessed to be eligible for HNIP, it is assumed a grant could be achieved that is broadly in line with the cost-effectiveness targets advised by HNIP. By taking this approach, the level of risk that the actual HNIP award will be different is similar between projects.

2.13. Scoring of Options

2.13.1. Options are scored against the project Critical Success Factors (CSFs), as described in Section 2.2, using a mix of quantitative and qualitative assessments, with the different components weighted to give an overall score.

2.13.2. For the Qualitative assessments, either a score of 1 to 5 was assigned (where possible), or a Pass or Fail was given where there was clear compliance or non-compliance with the CSF.

2.13.3. For Quantitative assessments, scoring was translated into a similar 1 (low) to 5 (High) scale, using the relevant metrics such as IRR and Tonnes Carbon.

2.13.4. It is important to note that the CSFs have been developed to cover backstops across technical, commercial and financial matters. Because at this stage, we are only looking at the technical decisions, we can only assess the CSFs that are affected by these technical choices. Those CSFs which are more dependent on subsequent commercial or financial choices tend to be assessed on a pass/fail basis and at this stage it is assumed they will be able to pass.

2.13.5. It is also important to avoid double counting in the scoring. For example, we are placing substantial weighting on the volume of carbon savings. It is therefore important to base the economic scoring on metrics which do not include a valuation of these carbon savings.

2.13.6. A weighting factor (out of 95) was assigned to each Critical Success Factor to stress importance in the overall project rating.

[13] The HNIP loans are subsidised and close to zero interest – they transfer a subsidy to the project as long as the project was planning on using debt anyway (which almost all infrastructure projects do). The degree of subsidy in the loan depends on the borrower's normal borrowing cost – for the Council, the subsidy in the loan is worth approx. 1/3 of the loan value i.e. if the Council was planning on borrowing £3m but instead takes a £3m loan from HNIP, it is the same as if it had borrowed normally and received a £1m grant.

[14] See separate advice on State aid in the commercial case, generally this is not considered to be constraint for the Council projects

2.14. Sensitivity and Risk Analysis

2.14.1. To ensure that a robust conclusion is drawn from the analysis of the shortlisted options, sensitivity and risk analysis was undertaken for each option. This included:

2.14.2. Sensitivity Analysis – At this high-level assessment stage, there are a number of inputs into the techno-economic model that have some level of uncertainty. Further design, commercial negotiation or market arrangement would be required to increase certainty regarding these inputs. Further information and the results of the analysis can be found in Sections 2.27 and 2.40.

2.14.3. Risk Analysis – This looks at the more fundamental risks which may have a significant impact on the projects' outcome and allow for a more realistic assessment of which is the preferred option, considering the Council's risk appetite. Risks cover reductions in the forecasted scheme build out and loss of key benefits such as HNIP grant and CIL.

2.15. Overview of DH Opportunities

2.15.1. As set out in the Strategic case there are several opportunities for DENs in Haringey and the surrounding boroughs. In part these opportunities arise from the close proximity to the NLHPP ERF (North London Heat and Power Project, Energy Recovery Facility) and the associated Energetik network.

2.15.2. It is also important to note that several previous studies commissioned by the Council expect the eventual outcome of the DENs in Haringey in the long-term is for a single network to emerge connected back to the ERF. However, these studies have not looked carefully at phasing and whether or not it might be appropriate to commence build-out of some parts of the network further from Enfield before they are connected to the ERF.

2.15.3. However, the ability to connect back to the ERF is important and should affect which neighbourhood is analysed first. The order of analysis therefore reflects the DEN's geographical position relative to the ERF, as this is a key option in securing an LZC source of heat.

2.15.4. Figure 2.15-4 below illustrates the three main opportunity clusters for heat networks. The main dependencies when connecting these schemes to the ERF is:

- **Tottenham Hale and Broadwater Farm**
  - Highly dependent on the ERF facility and Meridian water scheme to obtain heat, however these schemes are relatively lower risk as they are largely either existing, under construction or approved for development.
  - Although these schemes are influenced somewhat by the strategy at North Tottenham (NT) connecting the ERF to TH & BWF significantly improves the viability of connecting to DENs further downstream.
  - Given TH and BWF are low risk DEN loads, and its proximity to Meridian Water, a connection to the ERF should be seriously considered. This would in effect become **Phase 1** of a wider Haringey wide DEN.
- **Wood Green**
  - Connecting the ERF to WG is directly dependent on the delivery of Phase 1.
  - Although there are some very large loads in WG which are either existing or under construction and some other schemes approved but yet to start on site, there are numerous other schemes which are not on site or do not yet have planning approval.
  - St Ann's and Woodberry Down are significant nearby DEN projects which the Council has reduced influence and control over.
  - Overall there is insufficient certainty over development to provide critical mass to justify a connection to Phase 1 at this time and so these projects need to be considered as a separate phase.

- However, WG is close to reaching critical mass and the Council has a good degree of control and influence over a sufficient volume of customers to give confidence critical mass could be reached. Therefore WG can be considered on its own without St Ann's or Woodberry Down.
- St Ann's and Woodberry Down can be included in the analysis as potential upside opportunities to WG.

– **North Tottenham**

- This project has previously been addressed in isolation in the NT DEN OBC.
- Although close to Enfield and upstream of Tottenham Hale, there is limited overlap between the projects and so this project has limited impact on the deliverability of Phase 1 (and therefore the wider network). This is a significant cluster of potential customers close to the ERF, however, it is not paramount in ensuring that either TH or WG is delivered.
- It is also relatively risky due to the complexity of the project and the need for it to pass several gateways before it is under construction. It is therefore considered appropriate for a DEN in this part of the Borough to remain within its own separate OBC.

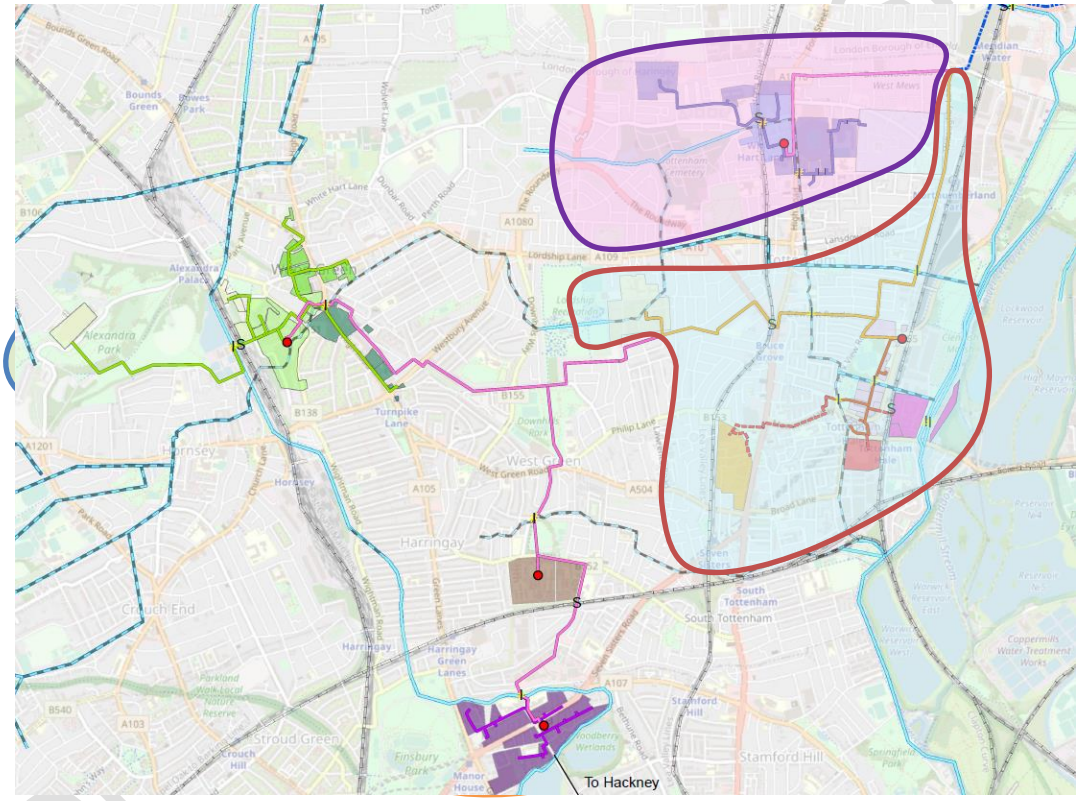


Figure 2.15-4: ERF Masterplan, and Potential Phasing of installation

2.15.5. [redacted]

Therefore, the Economic Case, whilst considering the interdependency of schemes, looks to establish a separate preferred option for Tottenham Hale and Wood Green (and North Tottenham).

2.17. The Tottenham Hale DEN

2.17.1. As per Section 2.3 the scheme variables for Tottenham Hale are as follows.

2.18. Network Extents - Tottenham Hale

2.18.1. The potential sites for connection to a DEN around Tottenham Hale have been identified through analysis of energy performance data on existing buildings and in discussion with planning, regeneration and housing to understand potential future growth.

2.18.2. A map of the potential sites to connect to the network is presented in Figure 2.19-1 below. A full table detailing the number of units and anticipated demand is included in Appendix D.

Shortlisted Network Extents - Tottenham Hale

2.18.3. The network extents for each network varies according to the LZC technology.

- **CHP** – The CHP (combined heat and power) network extent is based on serving only a small-scale scheme.
  - This excludes the Hale Village sites and Broadwater Farm as there is little incentive to extend a CHP led network to these sites as Hale Village already has a CHP and BWF is 1.8km from TH making little economic sense due to the relatively high cost of producing energy from CHP.
  - All future sites around Tottenham Hale are also excluded as there is limited attractiveness to connect to CHP in the future as its carbon benefits begin to diminish (see Appendix R for further information on CHP).
- **ERF** – The ERF network extent is based on serving a large-scale scheme which includes all of the TH loads plus Broadwater Farm. This because the low carbon heat from an ERF is relatively low cost and so supports a larger network extent.
- **Heat Pumps** – The HP network extent is based on serving a medium scale scheme which includes all TH loads but not Broadwater Farm, which, given its distance from the TH network, is assessed to be better served by a local Heat Pump.

2.19. Primary LZC Technology - Tottenham Hale

2.19.1. The Shortlisted LZC technologies which are to be assessed in the techno economic analysis are:

- **Centralised CHP (Combined Heat and Power)** – Heat is distributed via the network to customers. Power is exported and sold to the grid. No feasible customers to directly supply electricity have been identified in the vicinity.
- **ERF** – Heat is taken from the NLHPP Energy recovery facility and distributed to Tottenham Hale and Broadwater Farm via an additional 4.5km of interconnector pipe.
- **Heat Pump** – A ground source heat pump (GSHP), abstracting low grade heat from the ground via boreholes in Down Lane park is used as a source pf LZC. Additional heat capacity for wider schemes to be centralised using air source heat pumps (ASHP).

Figure 2.19-1 - Map of sites for the Tottenham Hale District Heating Scheme – wider area including Wood Green, St Ann's and Woodberry Down and a zoomed in view of the Tottenham Hale area

2.20. Energy Centre Strategy and Location - Tottenham Hale

2.20.1. In order to limit capital expenditure, a single new Energy Centre (EC) of an approximate footprint of 600m^2 is proposed to be constructed. All LZC plant is to be located in the EC, as well as boiler plant sized to deliver the peak heat to the core Tottenham Hale sites.

2.20.2. Three locations, which effectively represent sub-options, were assessed for the new energy centre as follows:

- The Depot Site
- Underneath Watermead Way Flyover
- Adjacent to Watermead Way Flyover

2.20.3. Following stakeholder engagement and design development, the preferred site for the EC is, primarily the land beneath the bridge, and secondly green space adjacent to Watermead Way. The area is owned by the council and is considered comparatively low value.

2.20.4. For the satellite sites being served by the DEN. The proposed strategy is to use existing or new energy centre/plantrooms to locate peaking and resilient gas boiler plant, plus thermal storage where possible. This includes;

- Utilisation of the existing, Hale Village Energy Centre and Broadwater Farm Energy Centre
- Utilisation of the existing plantrooms at The College of Haringey, Enfield and North East London (CONEL), Leisure Centre, Town Hall/ Community Centre.
- Integration of a satellite energy centre within the proposed Retail Park development south of Ferry Lane.

2.21. Network Capacity - Tottenham Hale

2.21.1. Note that the network capacity has limited impact on the ranking of technical solutions and will be finalised in the next stage.

2.21.2. The shortlisted strategy for network capacity in Tottenham Hale is:

- **Local Network:** Pipe from the centralised energy centre is sized to deliver:
  - Peak heat demand to the core local sites in Tottenham Hale (those identified in the small-scale network extent); Plus
  - Baseload Heat only to the wider Tottenham Hale network. Noting:
  - Current expansion envisaged South, East and West of the core network.
  - Some flexibility in future to adapt where the baseload heat is supplied from should development plans change.
  - The baseload heat output is relatively fixed from the start.
  - The peak heat requirements for some wider sites will be served from local boiler plant (rather than the main energy centre), which allows the network pipe sizes required (and therefore capital expense) to be reduced (although there are some downsides in terms of economies of scale on future operating costs and flexibility to adapt the network).
- **Interconnector** (only applicable to ERF option): The interconnector pipe is used to supply:
  - The Tottenham Hale local network. Connection point to be at the Flyover Energy Centre.
  - Broadwater Farm. Connection point at the existing centralised plantroom.
  - Branch from Broadwater for future extension to serve Wood Green and associated DENs
  - The heat from the ERF will be used to supply baseload heat only. The network will be sized to take the full availability of heat from the ERF (20MW) to maximise future expansion.

2.21.3. This includes considerable spare capacity over and above the initial sites based on the identified future loads. Although the quantum of future loads that could be connected is somewhat limited, there is a good degree of flexibility about where these future loads might be located but the network has good adaptability to respond to changes in location of load.

2.22. Network Route - Tottenham Hale

2.22.1. The precise network route has a limited impact on the ranking of technical options and will be finalised in the next stage.

2.22.2. The route for the local network within Tottenham Hale has a limited number of options as the customers sites are mainly situated either side of the short stretch of Ashley Road. Some optioneering has been undertaken at the Northern end of the network to assess benefits of running through Down Lane Park, though this concluded that keeping the network under the road, would be the preferred solution.

2.22.3. The proposed interconnector route shown is more notional and there is a degree of flexibility in how it is routed. Further development will be needed during commercialisation. To allow for deviations from the initial design, an additional 10% of network pipe capital allowance has been included in the economic analysis.

2.23. Summary of Variables for Shortlist – Tottenham Hale

2.23.1. The shortlisting process reduced the number of variables of each design parameter. Those remaining were taken forward for analysis and scoring against the CSFs. In summary the following was shortlisted.

Table 2.23-1 - Summary of Shortlisted variables

Variables	Shortlisted
Network Extent	**Dependant on LZC Technology** (see below)
	CHP – Small Scale Scheme i.e. to TH core sites only.

Primary LZC Technology	**ERF Connection** – Large Scale Scheme i.e. to all TH sites plus BWF
	Heat Pump (GSHP & ASHP) – Medium Scale Scheme i.e. to all TH sites
Energy Centre Strategy	LZC sized to serve **baseload** heat using **multiple** energy centres for peaking and resilient plant.
	Adjacent to flyover selected as preferred EC location
Network Capacity	Not critical to assessment at this stage **Local network** sized to serve peak heat to the small core sites and baseload to the wider sites. **Interconnector** sized to take full 20MW available from ERF and serve baseload heat to Tottenham Hale and Broadwater Farm. Remaining capacity available for onwards baseload supply to Wood Green and further sites.
Network Route	Not critical to assessment at this stage. To be reviewed at next stage. Limited options within local area, considerably flexibility in interconnector route.

2.24. Shortlist of Options - Tottenham Hale

2.24.1. The shortlisted variables have been organised into three main options to be taken forward for the economic analysis. Outline design work and modelling was undertaken to establish what each option may look like in terms of the capacity of plant, lengths of pipe, energy centre dimensions and number of building connections.

2.24.2. These outputs were combined with industry metrics on cost to deliver and maintain all assets required for each option to create a Techno Economic Model which assessed the environmental and economic performance of each option. The full list of inputs into the techno-economic model can be found in Appendix E.

Option 0: Do Nothing

2.24.3. The 'Do Nothing' or counterfactual case, establishes the comparison scenario.

2.24.4. In this case the counterfactual case is communal gas fired boilers within each residential block, and gas fired boilers in a centralised plantroom for the commercial developments. In this case there would be no DEN between the buildings and none of the associated costs, risks, opportunities, revenues or benefits.

2.24.5. The counterfactual position has some conservative assumptions in that it assesses the cost to residents will be equivalent to the Heat Trust15 benchmark for an individual gas boiler which is a level which communally heated buildings are expected to aim towards. Experience shows in reality that tariffs on small communal networks can be significantly higher.

2.24.6. Note that the counterfactual option is not costed in the same way as the district heating options. There is no need to assess the absolute cost of 'Do Nothing' as we only ever assess the difference between this and each option (i.e. it is assumed to be zero (additional) cost across all three options).

Options 1 to 3

2.24.7. The key differential metrics between the three options are outlined in Table 2.24-9a. A graphic profile of the buildout of the network is given in Figure 2.24-9b It is worth noting that the capital spend does not all occur at the start of the projects but is spread over a decade or so. This is due to the heat network buildout being phased to suit the completion dates of the sites it is connecting to.

2.24.8. The initial buildout is where a significant proportion of the capital is incurred (constructing an energy centre and majority of network). Subsequent expansion is a lot cheaper as the project is solely paying for extending the network (and new customers are often at sites located a short distance from existing customers).

Table 2.24-9a - Summary of Key metrics for each option

	Unit	Option 0	Option 1	Option 2	Option 3
LZC Plant	-	None	CHP	ERF	Heat Pump

[15] The Heat Trust is an independent industry body offering consumer protection in the un-regulated heat market.

Estimated LZC Plant Capacity	MW	N/A	1.7	TH (~6.5), BWF (~1.5), West Branch (towards WG & WD) (~12)	4
Annual Heat Demand at Full Build Out	MWh	N/A	12,787	43,974	33,274
Total Network Length	meter	N/A	1877	7209	2809
Estimated Total Scheme CapEx	£	N/A	[redacted]	[redacted]	[redacted]
£/MWH Heat Delivered	£	N/A	[redacted]	[redacted]	[redacted]

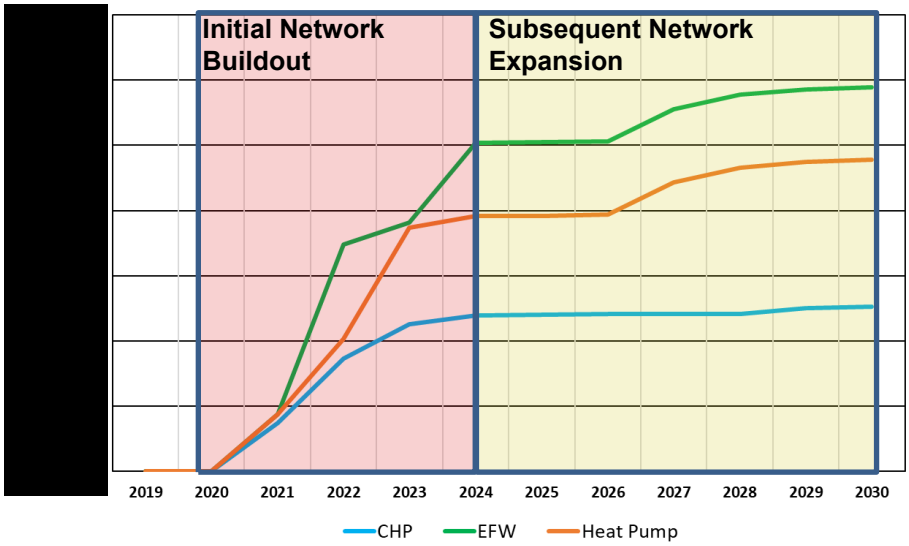


Figure 2.24-9b Estimated Capital Expenditure Profile for the Shortlisted Options

2.25. HNIP Grant - Tottenham Hale

2.25.1. As outlined in Section 2.12 , securing HNIP can be a key aspect in ensuring financial viability of the schemes. However, said schemes need to be eligible. The first eligibility criterion is a positive pre grant IRR.

Table 2.25-1: Initial Scheme 40-year IRR (pre-grant) check.

	Option 1 (CHP)	Option 2 (ERF)	Option 3 (Heat Pump)
40 -Year IRR (Pre-Grant)	[redacted]	[redacted]	[redacted]

2.25.2. Table 2.25-1 shows that of the three options CHP does not meet the initial test for HNIP. It is therefore scored and evaluated in the succeeding sections without any injection of grant funding. Option 2 & 3 are eligible for funding and so an initial grant value will be included in the analysis of these options.

2.25.3. Table 2.25-4 below sets out the initial assumptions around the HNIP grant. The funding request is based on achieving an investable IRR, based on the team's experience of what makes a viable project. As well as considering the cost-effectiveness in line with HNIP targets. (Note the HNIP target metrics were released after this economic analysis was undertaken).

2.25.4. Given its low pre-grant IRR, the HP scheme requires a significant grant intervention, and the Carbon saved, and heat delivered, per £1M of grant, is half that of the ERF scheme.

Table-2.25-4: Initial assumptions of level of grant funding.

		Option 1 (CHP)	Option 2 (ERF)	Option 3 (Heat Pump)
Estimated Total Scheme CapEx	£	[redacted]	[redacted]	[redacted]
Assumed HNIP grant value	£	[redacted]	[redacted]	[redacted]
Assumed HNIP grant as a % of total CapEx	%	[redacted]	[redacted]	[redacted]

2.26. Results of Economic Appraisal - Tottenham Hale

2.26.1. The initial economic appraisal for Options 1-3 and has been compared against the 'Do Nothing' counterfactual. This modelling has been undertaken as per the assumptions for financial (CapEx, Heat tariffs) and heat loads set out in Appendix E. HNIP grants have been assumed as per Table-2.25-4: Initial assumptions of level of grant funding.

2.26.2. The SNPV, and NPVs presented are for a 40-year project appraisal period and all energy prices and heat tariffs are indexed to BEIS Real price forecasts. The graphs below show a summary of the techno-economic performance results for the options considered.

2.26.3. As per the methodology in Section 2.9, scores were tabulated out of 500.

2.26.4. The CHP, ERF and Heat Pump options scored 205, 430 and 352 respectively. The ERF option scored significantly better on the Economic, Carbon and Attractiveness for Growth metrics.

2.27. Sensitivity Analysis – Tottenham Hale

2.27.1. A sensitivity analysis was run in the techno-economic model on a multitude of variables, including a variance in final Capital and Operational costs of ±15%, and decreases in revenue resulting from the final negotiated heat tariffs being lower than assumed.

2.27.2. As the ERF heat supply is a natural monopoly (i.e. there is only one person to purchase it from and there is not an effective market) an additional set of sensitivities were run on the heat purchase price.

2.27.3. Results of the sensitivity analysis is outlined in Figure 2.27-1. The trend is similar to the baseline results, in that the ERF still represents a substantially improved position over CHP, and measurable improvements on Heat Pumps.

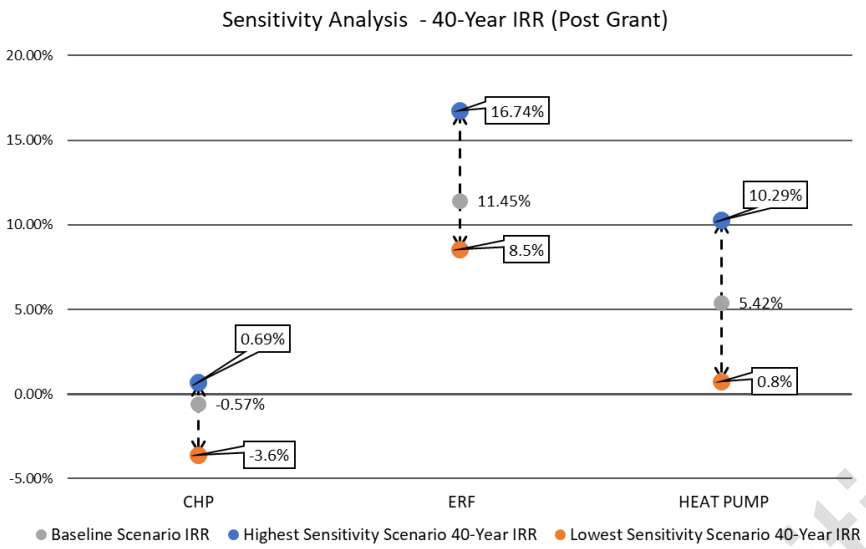


Figure 2.27-1: Sensitivity Analysis Results

2.28. Risk Analysis – Tottenham Hale

2.28.1. Risk scenarios were run to allow for a more thought out conclusion of which is the preferred option.

2.28.2. The key risk scenarios include risks such as, what if the Tottenham Hale network does not build out as forecast and secures less customers, and what if the schemes do not secure assumed capital from CIL or HNIP.

2.28.3. The resulting impact to SNPV, SIRR and IRR give a rounded view on the impacts of the various risk scenarios. The IRR range of the risk scenarios is outlined in Figure 2.28-1.

2.28.4. As shown, ERF has the highest 'worst case' IRR. This 'worst case' scenario for the ERF occurs when the scheme is limited to serving the small core extent of sites in Tottenham Hale, whilst maintaining supply to BWF and securing HNIP. The main conclusion from this is:

- The ERF still offers the best option for the TH DEN, post risk scenario testing.
- The ERF is expected to offer a minimum investable level of returns as long as the scheme secures HNIP. If HNIP is secured then the ERF option should be viable (to the council) even if it doesn't expand beyond the small core sites, and BWF.

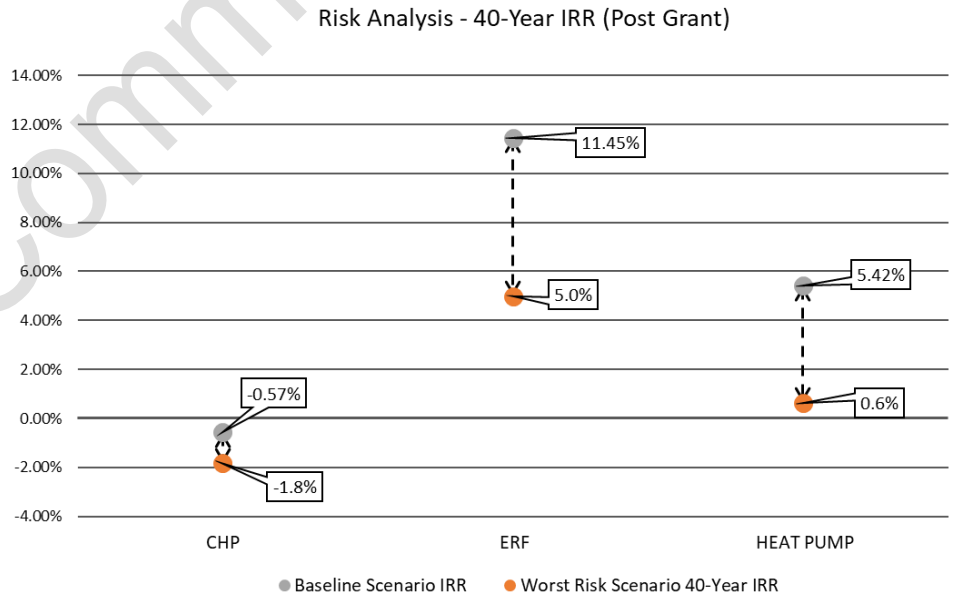


Figure 2.28-1: Risk Analysis Results

2.29. Preferred Option – Tottenham Hale

2.29.1. Post quantitative, qualitative, sensitivity and risk analysis, Option 2 – Energy Recovery Facility is concluded to provide the highest resulting score and the best opportunity for achieving the objectives specified by the Critical Success Factors for Tottenham Hale. The option in summary:

- **Network Extent** – The scheme should aim to serve the largest extent i.e. core sites in and around Tottenham Hale, wider sites to the South, East and West and Broadwater Farm. This will require approximately 7,200m of pipework to be installed.
- **LZC Technology** – Heat should be obtained from the North London Heat and Power ERF facility (in Edmonton) via the Energetik Meridian Water Network. The site is located 3km north of Tottenham Hale. The TH DEN scheme is anticipated to save up to 58,000 Tonnes of Carbon in the short term (15 years) and 270,000 Tonnes in the long term (40 Years)
- **Energy Centre** – A new Energy Centre should be constructed adjacent to the flyover. This will house boilers to supply peak heat and resilience (for the core scheme) (approximately 14MW). The plate heat exchangers for interfacing with the ERF in order to serve all of Tottenham Hale (initial loads plus subsequent expansion), with baseload heat and thermal storage (and the branch of the interconnector towards WG) should be sized at approximately 7.6 MW.

- Future extension of the network beyond the Core scheme will require more gas boiler plant for peak loads. This can be provided by existing infrastructure in Tottenham Green and at Hale Village, but a new satellite energy centre would need to be secured in the retail park.

2.29.2. Please see Figure 2.29 for a map of the proposed DEN at Tottenham Hale.

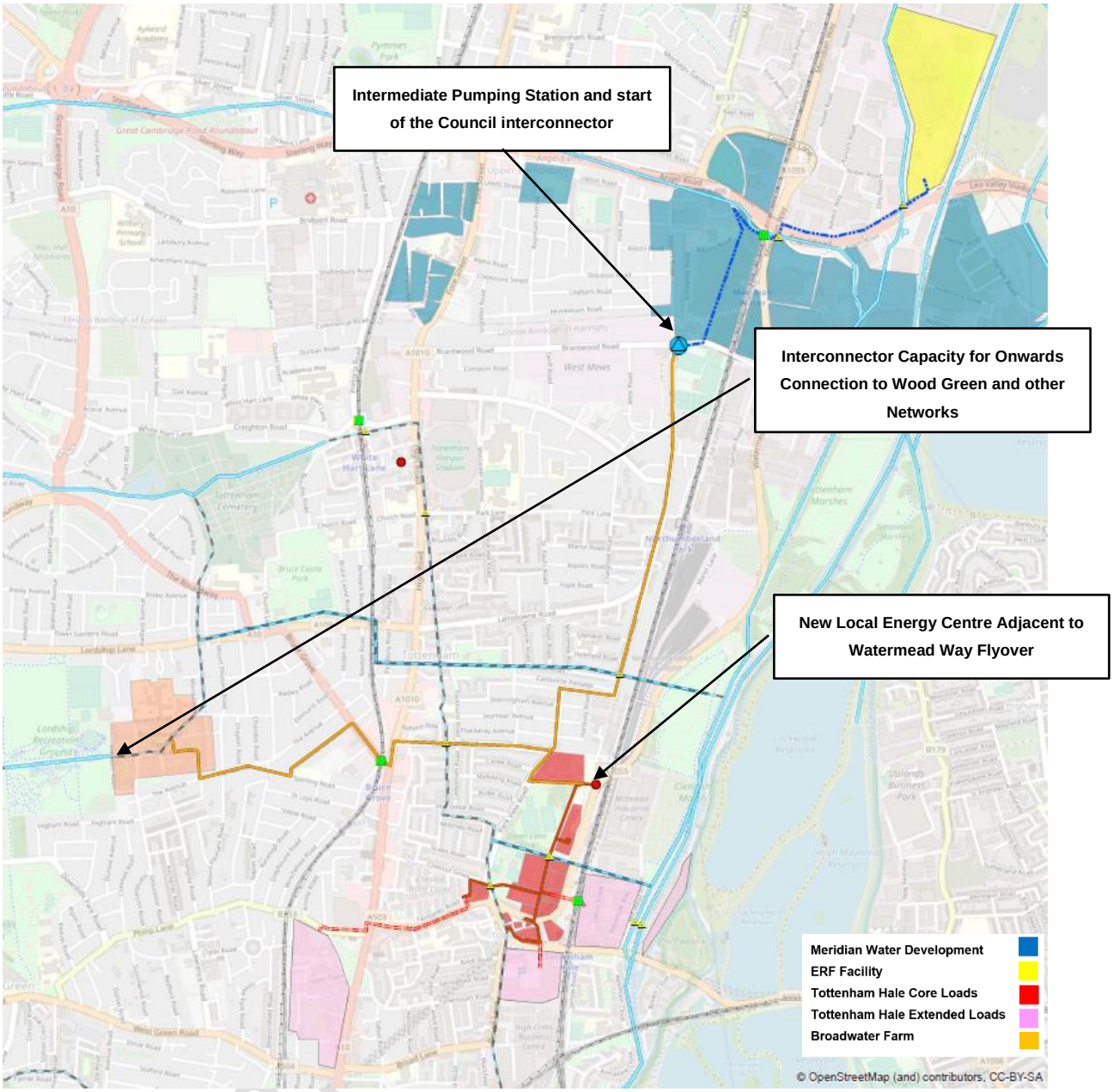


Figure 2.29: ERF relative to Tottenham Hale and Broadwater Farm

2.30. The Wood Green DEN

2.30.1. As per Section 2.3 the scheme variables for Wood Green are:

2.31. Network Extents - Wood Green

2.31.1. The potential sites for connection to a DEN around Wood Green have been identified through analysis of energy performance data on existing buildings and in discussion with planning, regeneration and housing to understand potential future growth.

2.31.2. A map of the potential sites to connect to the network is presented in Figure 2.32-1b below. A full table detailing the number of units and anticipated demands for each extent is included in Appendix D.

2.31.3. As described in paragraph 2.4.4, the network extent chosen varies for different technologies is described below.

Shortlisted Network Extents - Wood Green

2.31.4. The network extents varies according to the LZC technology.

- **CHP** – The CHP (combined heat and power) network extent is based on serving a smaller scheme based on the core sites in Wood Green. There are also opportunities to sell electricity via a Private Wire Network to customers such as the planned new council offices and the Wood Green Bus garage (where buses are being electrified and so there is a steady demand for power).
- **ERF** – The ERF network extent is based on serving all of the WG loads. There is an assumption that the ERF is already connected to Broadwater Farm (see Section 2.29). Additionally, separate analysis is undertaken to assess the opportunity to extend the network to Woodberry Down and St. Ann's. These are not included in the base scheme as they are considered relatively high risk and it is possible to decouple them from the Wood Green sites.
- **Heat Pumps** – The Heat Pump network is based on serving the medium scale scheme which includes all of WG.

2.32. Primary LZC Technology – Shortlist Options - Wood Green

2.32.1. The Shortlisted LZC technologies which are to be assessed in the techno economic analysis are:

- **Combined Heat and Power** (CHP) – Heat is distributed via the network to customers. Power is exported and sold via a private wire network; any excess electricity is sold to the grid.
- **ERF** – Heat is taken from the ERF in Edmonton and distributed to Wood Green, WD and StA via an additional 4.2km of interconnector pipe (from BWF).
- **Heat Pump** – A lead ground source heat pump (GSHP), abstracting low grade heat from the ground via boreholes in Barratt Gardens. As the network builds out, extra heat pump capacity could be added in the form of air source heat pumps on the roof of the energy centre at Clarendon Square based on ambient air or potentially located at the local TfL ventilation shaft at Wood Green tube station and based on exhaust air.

Small Scale Scheme (Core Scheme) (CHP/HP/ERF)

Medium Scale Scheme (HP/ERF only i.e. not CHP) +

Large Scale Scheme (expansion opportunity) (ERF only)

***Tottenham Hale and BWF (Phase1)*(WG ERF Dependant on this Phase)**

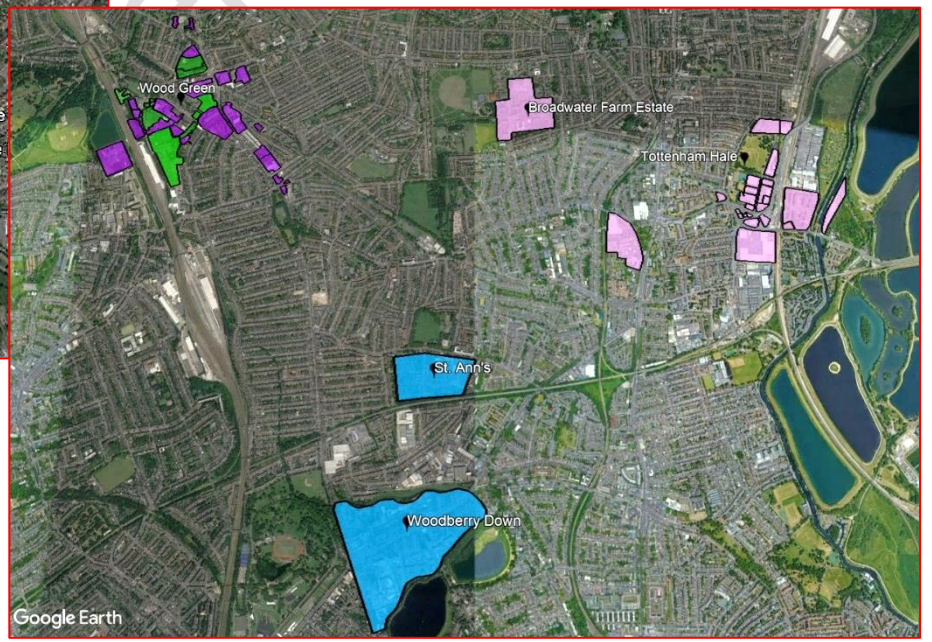


Figure 2.32 Network Extents Map (zoomed out map also showing Tottenham Hale, St Ann's and Woodberry Down and zoomed in showing Wood Green only)

Please refer to Appendix D for more details on the different network extents and buildings connected.

2.33. Energy Centre Strategy - Wood Green

2.33.1. **WG Energy Centre** – The energy strategy for Wood Green is largely predetermined on the basis that the developer St William has committed to providing the base build for a circa 1,000m² energy centre within the early phases of their Clarendon Square development. The EC will have significant space to hold the LZC plant plus up to 20-25MW of boilers. Alexandra Palace is proposed to retain its current boiler capacity (estimated at 5MW) and be supplied baseload heat from the central EC only.

2.33.2. **Expansion strategy**: If the scheme expands as forecast, there is limited chance that a small amount of additional space may be required to house further thermal storage or at worst case a few MW of peak - gas boiler plant. If required, this plant is proposed to be incorporated into a small satellite energy centre/plantroom located close to clusters of high heat density such as the north-east extension of the heat network. See Figure 2.33-3a for possible EC locations.

2.33.3. **Woodberry Down and St Ann's:** For the options considering ERF plus the additional opportunity to connect WD and StA, each of these clusters will have their own local heat network with their own central energy centre. These local energy centres will house peaking gas boiler plant as well as the plate heat exchangers (hydraulic interface) with the ERF interconnector pipework.

Potential Satellite EC Location – Constructed in future as required

Network Spine – Sized to supply full output from the Clarendon Sq. Energy Centre

Clarendon Square Energy Centre – Building provided by St William. Up to 20MW of Boiler Plant and LZC. Floor Area approx. 1,036m²

Network –Ally Pally retains existing Boilers.

Figure 2.33-3a - Energy Centre Location and Provisional Network Route

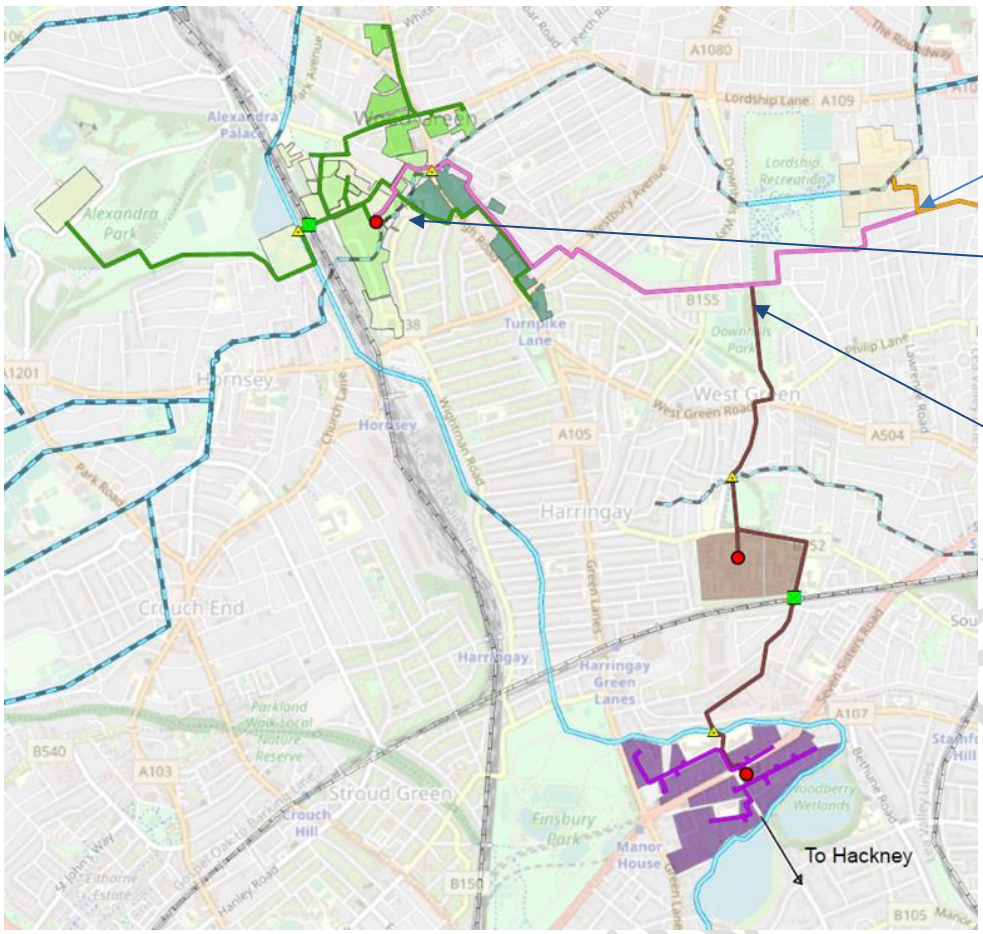


Figure 2.33 – ERF Option (2) – Interconnector Pipework Potential Routes

2.34. Network Capacity - Wood Green

2.34.1. Note that, as with Tottenham Hale, the network capacity has limited impact on the ranking of technical solutions and will be finalised in the next stage.

2.34.2. The shortlisted strategy for network capacity in Wood Green is:

- **Local Network**: Pipe from the centralised energy centre is sized to deliver:
  - Baseload heat plus peak heat demand of around 25MW to the local sites in Wood Green.
  - Note: Pipe sizing for the wider network is to be determined once there is further confirmation on which sites are connecting. The current strategy is to provide flexibility.
  - Baseload Heat only, to sites such as Alexandra Palace which will retain onsite boilers.
- **Interconnector** (only applicable to ERF option):
  - The interconnector pipe is to be sized to take the full availability of the ERF heat upstream from Phase 1 (Tottenham Hale and BWF – see Section 2.29). Opportunity for a branch to distribute towards Wood Green and WD and St A.
  - This pipe shall supply baseload heat and will be sized to match the available capacity to maximise future expansion.
  - The interconnector branch towards WD and StA shall be sized to transfer an additional 5MW of capacity reserved for networks further downstream in Hackney.

2.34.3. This includes considerable spare capacity over and above the initial sites based on the identified future loads. Although the quantum of future loads that could be connected is somewhat limited, there is a good degree of flexibility about where these future loads might be located and the network has good adaptability to respond to changes in location of load

2.35. Network Route - Wood Green

2.35.1. The network route needs to be carefully considered to ensure the schemes are as efficient and cost effective as possible. Final routing is influenced by several factors, a lot of which is determined in the detailed stages of project development. These factors include site surveys and ground investigations which will help identify what is installed below the surface.

2.35.2. For this OBC the network routes will be developed to an outline design stage, in order to ascertain reasonable cost estimates for connecting selected sites. This routing will be based on:

- Making the most efficient connections from the EC to the buildings and minimising the network length;
- The use of existing roads and pathways where public ownership enables development;
- The use of landscaped / pedestrian areas to reduce disruption to transport routes and allow lower cost installation; and
- The use of minor roads where utility congestion may be reduced and where traffic disruption can be minimised.

2.35.3. The network route for the local network within Wood Green has a number of options and is subject to development during the further stages of the project. The outline network route is set out in Figure 2.33-3 and for the ERF option the potential route is shown in Figure 2.33

2.35.4. As per Phase 1 (see Section 6.6) further development of the interconnector shall be undertaken during commercialisation. An additional 10% capital allowance has been made for potential deviations from the current notional route.

2.36. Summary of Variables for Shortlist – Wood Green

2.36.1. The shortlisting process reduced the number of variables of each design parameter. Those remaining were taken forward for analysis and scoring against the CSFs. In summary the following was shortlisted.

Table 2.36-1 - Resultant Shortlist

Variable	Shortlisted Solutions
Network Extent	**Dependant on LZC Technology –** *See below*
Primary LZC Technology	**CHP** – Small Scale Scheme i.e. to WG core sites only – private wire supply (electricity) to WG bus garage and New Council Offices.
	ERF Connection – Medium Scale Scheme i.e. to WG (all sites identified in WG) additional opportunity to connect WBD and St Ann's (Large Scale Scheme)
	Heat Pump – Medium Scale Scheme i.e. to all sites in WG only
Energy Centre LZC Strategy	LZC serves **baseload** heat and is centralised and accommodated within the **single EC** which is within Clarendon Square Should they be required future Backup/peaking energy centres (within development cluster NE)
Network Capacity	**Local network** sized to serve baseload + peak heat to all the Wood Green Sites except for Alexandra Palace, Woodberry Down and St Ann's which will be sized for baseload heat only. . **Interconnector** sized to take available heat from phase 1 to supply baseload to WG, WD and StA as well as reserved capacity for Hackney.
Network Route	Single route assessed at present.

2.37. Shortlist of Options - Wood Green

2.37.1. As per Tottenham Hale, the shortlisted variables have been organised into three main options to be taken forward for the economic analysis. The full list of inputs into the techno-economic model can be found in Appendix F .

Option 0: Do Nothing

2.37.2. The 'Do Nothing' or counterfactual case for Wood Green is as per Tottenham Hale (Section 2.24).

Options 1 to 3

2.37.3. The key differential metrics between the three options are outlined in 2.37-1a. A graphic profile of the buildout of the network is given in Figure 2.37. It is worth noting that the capital spend does not all occur at the start of the projects but is spread over time. This is due to the heat network buildout being phased to suit the completion dates of the sites it is connecting too.

Table 2.37- 1a: Shortlisted Options

Option	Unit	Do Nothing	Option 1	Option 2	Option 3
Technology	-	None	CHP	ERF	Heat Pump
Annual Heat Demand MWh	MWh	N/A	15,166	36,239	36,239
LZC Plant Capacity kW	MW	N/A	2.2	WG (6.5)	4,000
Total Pipework Length (m)	meter	N/A	1,693	8,104	4,728
Capital Cost	£	N/A	[redacted]	[redacted]	[redacted]
CAPEX / Heat Delivered	£/MWh	N/A	[redacted]	[redacted]	[redacted]

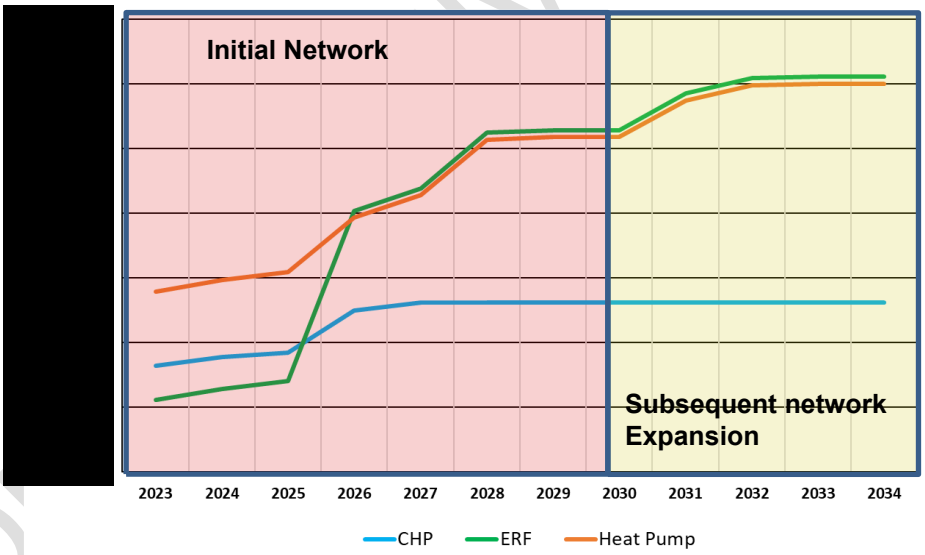


Figure 2.37 - Estimated Capital Expenditure Profile for the Shortlisted Options

2.38. HNIP Grant – Wood Green

2.38.1. As outlined in Section 2.12, securing HNIP can be a key aspect in ensuring financial viability of the schemes. However, said schemes need to be eligible. The first eligibility criterion is a positive pre grant IRR.

Table 2.38-1: Initial Scheme 40-year IRR (pre-grant) check.

	Option 1	Option 2	Option 3
40 -year IRR (pre-grant)	3.57%	5.45%	-0.81%

2.38.2. Table 2.38-1 shows that of the three options, the heat pump does not meet the initial test for HNIP and is therefore assessed without any injection of grant funding. For Option 1 & 2 an initial grant value will be included in the analysis.

2.38.3. Table 2.38-2 sets out the initial assumptions around the HNIP grant where the funding amount is based on achieving cost-effectiveness in line with HNIP targets. The CHP scheme is far less effective at generating the volume of energy sales and especially carbon savings which HNIP is trying to achieve and therefore can only be expected to receive a much smaller grant award from HNIP.

Table 2.38-2: Initial assumptions of level of grant funding.

	Unit	Option 1	Option 2	Option 3
Estimated total scheme CapEx	£	[redacted]	[redacted]	[redacted]
Assumed HNIP grant value	£	[redacted]	[redacted]	[redacted]
Assumed HNIP grant as a % of total CapEx	%	[redacted]	[redacted]	[redacted]

2.39. Results of Economic Appraisal – Wood Green

2.39.1. The initial economic appraisal for Options 1-3 has been compared against the 'Do Nothing' counterfactual. This modelling has been undertaken as per the assumptions for costs (CapEx, Heat tariffs) and heat loads set out in Appendix F. HNIP grants have been assumed as per Table 2.38-2

2.39.2. The SNPV, and NPVs presented are for a 40-year project appraisal period and all energy prices and heat tariffs are indexed to BEIS Real price forecasts. The graphs below show a summary of the techno-economic performance results for the options considered.

[redacted]

2.39.3. As per the methodology in Section 2.9, scores were tabulated out of 500.

2.39.4. The CHP, ERF and Heat Pump options scored 278, 420 and 235 respectively. The ERF option scored significantly better on the Economic, Carbon and Attractiveness for Growth metrics.

2.40. Sensitivity Analysis – Wood Green

2.40.1. A sensitivity analysis was run in the techno-economic model on a multitude of variables, including a variance in final Capital and Operational costs of ±15%, and decreases in revenue resulting from the final negotiated heat tariffs being lower than assumed.

2.40.2. Results of the sensitivity analysis is similar to the baseline results, in which ERF is presents a substantially improved position over Heat Pumps, and some improvement over CHP.

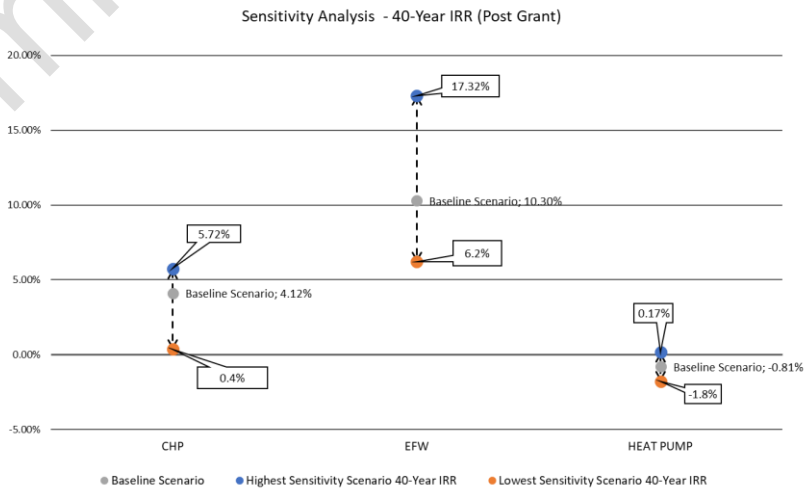


Figure 2.40-2 - Sensitivity Analysis Results

2.41. Risk Analysis – Wood Green

2.41.1. As previously outlined risk scenarios were run to allow for a more thought out and risk adjusted conclusion on the preferred option.

2.41.2. The resulting impact to SNPV, SIRR and IRR give a rounded view on the impacts of the various risk scenarios. The IRR range of the risk scenarios is outlined in

2.41.3. Figure 2.41-6. This shows how the IRR changes from the baseline to the worst-case risk scenario.

2.41.4. The loss of private wire supply for the CHP scenario has been modelled under sensitivities and has a significant impact on the viability of CHP. (IRR reduced to 0.4%) This is a major risk, especially given shifting policy which is unfriendly to private wire, including Ofgem's Targeted Charging Review and potential curtailments of when CHPs can export to grid.

2.41.5. Figure 2.41-6 and the sensitivity analysis, the CHP becomes financially unattractive if there is any reduction in number of connections or a loss of private wire sales (or both). The ERF remains at a positive IRR even with a significant reduction in in the number of connected loads (28 down to 7 connections). Note, this IRR is on the basis that the full assumed HNIP grant is awarded, care is needed with this assumption as the grant conditions may not allow this. However it demonstrates the robustness of the ERF scheme even with some drop in connections.

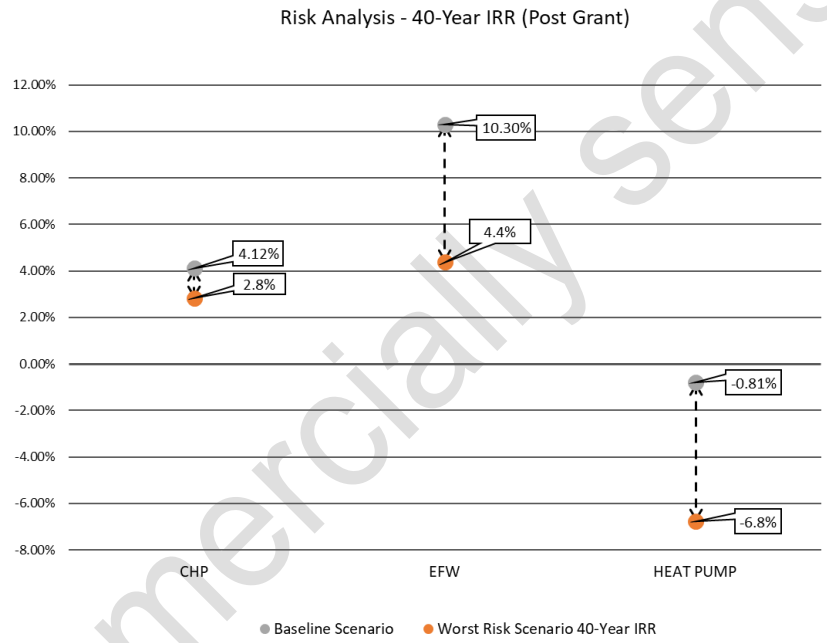


Figure 2.41-6: Risk Analysis Results

2.42. Opportunity Analysis – Wood Green

2.42.1. The relative proximity of the significant heat demands of Woodberry Down (WBD) and St Ann's (StA's), offers an opportunity to expand the Wood Green network (Large scale scheme – see 2.31)

2.42.2. [redacted] Whilst St Ann's is being developed in partnership with the GLA and therefore has a greater likelihood to connect, on its own is unlikely to justify the length of interconnector pipework required to deliver heat to the site without additional grant funding.

2.42.3. Due to these factors, these two connections have been considered as opportunities rather than part of the base network.

2.42.4. Figure 2.42-4 shows the financial impact of switching on the various connections. The addition of Woodberry significantly improves the ERF performance. This is primarily through the significant additional heat sales (24GWh) and anticipated connection charges [redacted]. St Ann's has a slightly detrimental impact on the IRR, due to the additional cost to connect not offset by the low volume of heat sold. However, should WBD be secured, it is likely to be pursued on the basis of social benefits.

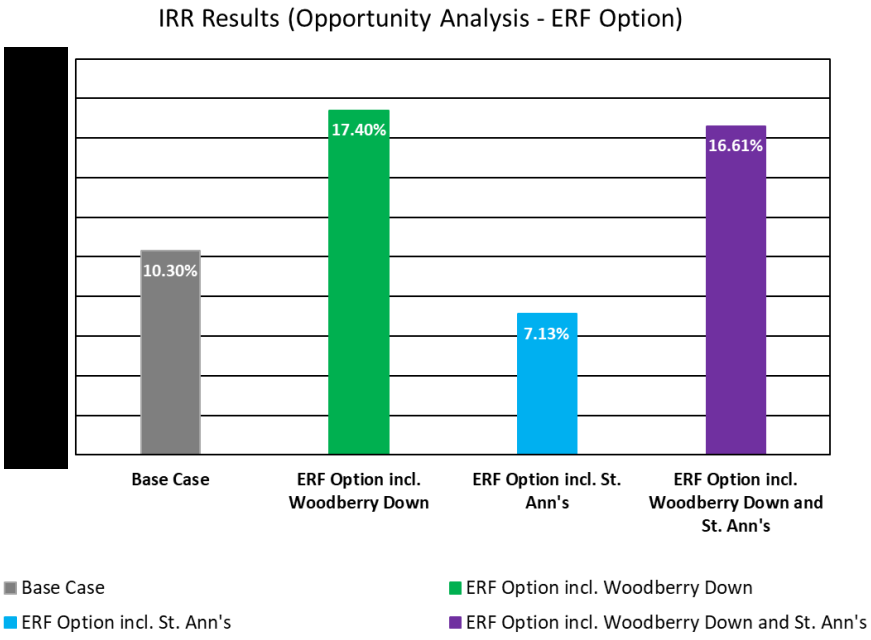


Figure 2.42-4: ERF Opportunity Results.

2.43. Preferred Option – Wood Green

2.43.1. Based on the initial comparison of results and sensitivity analysis (prior to risk adjustment):

- the ERF option provides the best solution in terms of economic and social benefits

2.43.2. The baseline CHP option scores OK, from an economic perspective however has significant risks around the future of private wire supply which underpins its viability. It also scores poorly on social benefits and so on balance is not recommended

2.43.3. There are critical dependencies with Phase 1 (an ERF Scheme) which introduces some caution in concluding the ERF as the preferred option for Wood Green. However, at the time of writing;

- An HNIP grant has been offered for Tottenham Hale [redacted]

- There remains the risk that the scale of development in Wood Green is a lot less than forecast, given the majority have only been identified in the Council area action plan, and are some years away from making planning applications to the council.
- However, a second HNIP grant has been offered for Wood Green. Risk analysis shows that with the HNIP grant on offer (for Wood Green), even a with very limited number of connections transpiring, the scheme IRR remains positive.

2.43.4. In parallel there is also a time imperative around Wood Green, as follows:

- The Council need to make a final commercial offer to St William (the developers of Clarendon Square) which is pivotal to ensuring a network is delivered in WG. This offer must be provided by Q3 2022 to provide St William with the stipulated time to consider and enter into negotiations with the Council.
- The Council need to gain OBC approval to undertake the work required to firm up the case for Wood Green, thus enabling the above discussions to take place.

2.44. Way forward – Wood Green

2.44.1. It is clear that ERF is the preferred option for Wood Green, and all actions should be undertaken to ensure its delivery. A number of these will be delivered as part of commercialisation activities for Phase 1 (Tottenham Hale and Broadwater Farm), including the negotiations with Energetik. Other activities specific to Wood Green include;

- Finalisation of the HNIP process for Wood Green.
- Continuing to coordinate technical requirements with the St William Clarendon Square energy centre design teams, to enable an ERF connection.
- Gain further certainty on development plans in Wood Green.
- [redacted]
- Looking to secure agreements in principle to supply Woodberry Down and St Ann's.

2.44.2. Please refer to the Management Case for further information on the strategy for the next stage of works for Wood Green.

2.45. Further Note on Sensitivity Analysis

2.45.1. The analysis above to select preferred options for both TH and WG was undertaken some time ago. Since then, a number of changes have been identified to the assumptions around the scale and timing of development at confidence that this will proceed. These changes tend to have a similar impact across all options and so are not significant enough to affect the preferred option. Therefore the analysis in the Economic Case has not been updated to reflect these changes.

2.45.2. However, the refreshed inputs have been used in the Financial Case where the cost, funding and affordability of the scheme is affected by even small changes in the input.

2.45.3. The Financial Case is therefore based on slightly different (more up to date) base case assumptions on the build out of the scheme. Furthermore, the Financial Case considers a 'shock test' sensitivity where a significantly slower build out is used as a sensitivity (see section 4.13.9). Both the updated base case and the shock test scenarios used as inputs to the modelling have been developed in close consultation with the planning and regeneration departments.

Section 3: Commercial Case

3.1. Purpose of Commercial Case

3.1.1. The commercial case for the District Heating Networks (DENs) at Wood Green and Tottenham Hale will demonstrate the commercial approach to delivering the projects including the delivery options and procurement routes required alongside a commercial strategy.

3.1.2. While this Commercial Case pertains to Wood Green and Tottenham Hale, it should be noted that the solutions contained herein, takes into account the Council's potential wider programme of DEN projects, and so are compatible with the programme as a whole.

3.2. Commercial Strategy

3.2.1. Note the analysis that follows is for the planned TH and WG projects. A similar analysis was done in the 2017 OBC for the planned DEN project in North Tottenham (and much of the same logic applies between the three planned schemes).

3.2.2. It is important to note that as well as these schemes which are still in development, the Council has a number of existing DENs (and DENs under construction) within the HRA where decisions on the role allocation have already been made. The existing DENs serve around 1,400 residents (850 at Broadwater Farm and around 600 across 33 smaller schemes) and there are around 250 new homes currently being delivered at two sites in the Housing Delivery programme which have building scale DENs and a further 450 new homes across several other sites in the pipeline that will have shared heating systems.

3.2.3. At the end of this section, the difference in roles between the proposed TH, WG, NT and existing HRA schemes will be discussed in section 3.4

3.3. Commercial Strategy for Tottenham Hale and Wood Green

3.3.1. The high-level Commercial Strategy for the TH and WG projects requires identification and assignment of the various roles involved in the development, delivery and operation of a heat network. It is particularly important to identify the roles the Council will perform. The roles can be further categorised as follows:

3.3.2. **Roles that the Council must / should perform:** These are roles that the Council must perform for the successful delivery of the project and achievement of eventual objectives. They also include roles which the Council is obligated to undertake.

3.3.3. **Roles that will be performed by a number of parties including the Council:** These are roles that could be performed by the Council and other parties as well e.g. the Council alongside other property owners will act as landlord, landowner and customer.

3.3.4. **Roles that the Council must avoid:** These are roles that the Council must not perform due to a lack of expertise, unacceptable risks and/or unmanageable conflict.

3.3.5. A summary of the roles is set out in Table 3.3.5 below, including an analysis of whether the Council must, should, could or won't undertake particular roles. The analysis of the degree of imperative to take on the roles assumes that there is a desire for the project to happen. While there is no compulsion on the Council to deliver the projects, the preceding Strategic and Economic Cases set out the need for the projects and the economic benefits they can bring.

Table 3.3.5 - DEN Roles

Role	Comments	Relevant Entities
Promotion	Whilst this role can, in theory, be taken on by a number of parties, the projects in Haringey generally involve multiple developments and the Council is unique in having the power and ability to coordinate them. Most stakeholders that undertake this role will be limited to projects confined to their own property and the council with its overarching responsibility has a unique perspective. The Council, armed with statutory powers relating to planning and policy, alongside its role as significant land/property owners, being major energy users itself and having significant community and local public sector relationships can leverage its assets/buying power and relationships to promote heat networks. Consequently, the Council **must** perform (and already is performing) this role to maintain strategic control, provide direction and ensure integration with future development plans and the wider borough agenda.	The Council / Heat Undertaking
Funder	The investor market in district heating is growing. However, investor funding requirements are unlikely to be met by the proposed projects without significant Council backed guarantees. This means many of the substantive risks will remain with the Council and it is therefore better value for money for the Council to invest directly as the cost of capital will be lower suggesting the Council should fund the project. However, the main constraint is that there is insufficient time in the programme to bring in third party finance prior to taking a decision to proceed with the project. This constraint means the Council **must**, therefore, act as Funder. The Council can access low cost finance from a variety of sources including existing resources, grant funding, planning obligations / developer contributions, connection charges etc.	The Council
Asset Ownership	Asset Ownership covers the new assets for the project including: generation assets, primary and secondary networks (i.e. the network between buildings and the network within buildings respectively). It does not include assets outside of the project such as the ERF itself or Energetik's pipes within Enfield. Secondary networks are often retained by building owners and so are typically in varied ownership. The key asset ownership question concerns primary networks and generation assets which are frequently in common ownership due to the limited size of most UK DENs. Note also that whilst there will be instances where some primary network components are on developer land, they will typically be owned as part of the primary network with leases and easements in place to achieve this. The Council (or a Council owned heat undertaking) **must** undertake this role (for the core assets).	The Council / Heat Undertaking
Governance	To ensure direction of the project and ensure progress towards policy objectives alongside the need (as a funder) to oversee financial performance, this is the role the Council **must** perform.	The Council / Heat Undertaking

Role	Comments	Relevant Entities
Regulation	When the TH/WG schemes are operational a national heat regulator will be in place which will be OFGEM.	OFGEM tbc
Supplier of last resort	A "supplier of last resort" (SOLR) is required if the heat supplier goes insolvent or fails in some other way. The regulated electricity and gas supply markets have statutory processes to deal with issues arising out of supplier bankruptcies, but no such bespoke arrangements exist for heat networks. However, where the heat network is operated by a separate entity that is backed/owned by the local authority, the local authority effectively takes on this role through either its contractual linkage as the shareholder, reputational standing or through its role as a landlord (e.g. there is no SOLR at Broadwater Farm where the Council is both the landlord and heat supplier and has sufficient financial standing to mitigate the issue). Therefore the Council **must** take this role.	The Council
Installation	The Design and Build (D&B) contractor installs (and typically also designs) the heat network and takes construction risk and some liability for defects post completion. The Council should **avoid** this role as it lacks the capacity and expertise and therefore it must be outsourced.	D&B contractor
Operation	An Operator is responsible for the operation and maintenance of the heat network and is responsible for ensuring sufficient heat is available to meet demand. The Council should **avoid** this role as it currently lacks the capacity and expertise and therefore it must be outsourced. In the medium-term, if the DEN grows as expected, there may be scope to insource all or part of this function.	O&M Contractor
Sale of heat	This role involves ensuring heat is provided to customers and so involves generation and/or procurement of heat, distribution and supply. Note that electricity and gas markets have separated monopoly distribution roles from generation and supply where there is a degree of competition. This is not the case within the heat network market. This is because the limited size of networks means that even if generation and supply were separated from distribution, there would not be sufficient competition in these functions. Therefore, the same organisation can be, and frequently is, responsible for all three functions and heat customers do not have the option to switch suppliers. Whilst generation, distribution and supply can be assigned to separate entities, this i) does not guarantee >1 supplier to allow customer choice and ii) adds significant complication when initiating for projects which are still evolving as is the case with Haringey, and it is assumed these roles will remain vertically integrated (although generation of most of the heat will be at the ERF, this will not be a firm supply and the Council is responsible for ensuring reliability – see paragraphs 3.12.17 and 3.12.18). Therefore the Council (or its heat undertaking) as the Asset Owner **must** perform this role.	Heat Undertaking

Role	Comments	Relevant Entities
	Note: The Council's ALMO, Homes for Haringey (HfH), could be used to facilitate the sale of heat by providing the primary customer service interface and managing billing and income generation (functions in line with HfH's existing skillset). Later on, the costs assigned to delivery of this part of the service assume this will be done 'in-house'. If this is not the case, operating costs will increase but the change is minor. Finally, note that there will be cases where the project supplies heat in bulk to landlords who then supply heat to residents (including e.g. the Council as landlord of several HRA blocks). In this case, the landlord takes on the 'sale of heat' role (the Council has already taken this role in the HRA) but this is technically outside of the project boundary.	

3.3.6. The Council has a number of other drivers that help clarify what roles it should take on. These include those listed below.

- The Council **MUST** provide heat to HRA blocks, BWF and North Tottenham. In fact, the Council is already doing this role, and is supplying heat to over 800 homes at BWF, as it has done for the last 50 years.
- The Council has commitments and targets it **SHOULD** meet and has committed to looking at a DEN to provide heat to all of the new developments around the WG and TH areas.
- All buildings in Haringey will need to decarbonise in the future. Haringey is geographically well placed and is going through a growth spurt, meaning that it is ideal for heat networks. The Council **SHOULD** facilitate a heat network now, as the alternative will be more costly in the future.
- If in the future it was decided to extend the interconnector to Wood Green, the Council has the opportunity to discuss joint ownership of that piece of infrastructure with other LAs and the GLA. However, with the wider development programme under way there is a time imperative and the Council **MUST** decide if it will commit to developing the WG and TH DENs now prior to concluding discussions with potential co-investors.

3.3.7. As shown above the Council will be involved in a number of key roles, which are commercial in nature. There is a need for the Council to decide whether it will take on these roles itself or create one or more companies to do so on its behalf. There are a number of options available to the Council which are discussed in the next section.

3.4. Differences in Commercial Structure Between Council Schemes

3.4.1. Reviewing the OBC for NT and historic decisions for HRA schemes, there is much in common between the four schemes in terms of role allocation. The Table below sets out the different role allocations.

Table 3.4-1 – Difference role allocations

	TH and WG	NT	HRA
Promoter	Council Must	Council Must	Council Has
Funder	Council Must	Council Should	Council Has
Asset Ownership	Council (or SPV) Must	Council (or SPV) Should	Council Has (without an SPV)
Governance	Council Must	Council Should	Council Has
Regulation	Ofgem Will	Ofgem Will	Council Has (inc Local Government Ombudsman) but Ofgem Will

	TH and WG	NT	HRA
Supplier of Last Resort	Council Must	Council Must	Council Is/was
Installation	Council Won't	Council Won't	Council Hasn't
Operation	Council Won't	Council Won't	Council Hasn't
Sale of Heat	Council (or SPV) Must (but could involve HfH in customer service role)	Council (or SPV) Should (but could involve HfH in customer service role)	Council Has (without use of SPV but has employed HfH to manage assets and provide customer service exclusively on unmetered schemes)

3.4.2. The principal differences between the TH/WG schemes and NT is that there is potential to involve the private sector at NT due to the degree of control provided through the scale of the council-led High Road West development. The development programme for High Road West is not as compressed as that in TH and WG and a single developer provides much greater control. These two factors facilitate the option to involve the private sector in funding and owning the scheme. However, the 2017 OBC for NT still recommended that the Council should take on these roles and lead on delivery of the NT scheme.

3.4.3. There are a few key differences between the HRA schemes and the other three schemes in that

- The decisions have already been taken for the HRA and, if there were choices for how to implement projects, they have already been made.
- The HRA schemes are smaller and more or less exclusively supply the Council's own housing stock (the exception being two community schools at Broadwater Farm)

3.4.4. Apart from those key points, the role profile the Council has already chosen to take in the HRA is essentially the same as the profile being proposed at TH, WG and NT.

3.4.5. There are some other key differences between the historical approach taken by the Council when supplying heat within the HRA and recommendations for the three new schemes, the main ones being:

- the Council has delivered its heat supply business in-house rather than setting up an SPV. The three new schemes have the option to do this differently (and this is discussed in the next section)
- the Council has effectively self-regulated (although technically schemes are under the remit of the Local Government Ombudsman and, because the Council has been supplying customers as the landlord, additional protections have applied to residents from various housing-related acts including those arising from leasehold reform). In the future, Ofgem will take this role for all schemes.
- HfH has provided the customer service role on HRA DENs but this has exclusively been on schemes without heat meters where residents were charged on a flat rate basis. HfH has no experience of operating a billing service based on metered data which is what is required for the other three schemes.

3.5. Delivery Vehicle Strategy

3.5.1. There are a wide range of delivery structures suitable for delivery of the DENs in TH and WG (NT is not considered here and, as discussed above, the Council has already chosen to deliver DENs in the HRA directly). Set out below are potential structures which represent points along a spectrum, ranging from fully public sector led to fully private sector led. Examples of where the models have been used are provided together with an assessment of the suitability for the TH and WG DEN projects based on the analysis in section 3.3.

Table 3.5-1 – Delivery Vehicle Options

No.	Description
1	*Entirely public sector funded, built, operated and owned with no separate delivery vehicle* ***[Not practiced in UK due to lack of capacity and expertise within LAs/size of schemes – therefore not suitable for TH and WG]***
2	Entirely public sector funded operated and owned (hence no separate delivery vehicle), except design and build by private sector under a series of contracts for various aspects of the Project. **[In-house, e.g. the Council's own schemes in the HRA, larger schemes in Camden, Islington, Westminster. However, this option does not qualify for HNIP support and so is not a viable option for the TH and WG projects]**
3	Fully public sector owned delivery vehicle with D&B and some functions outsourced to private sector delivery partner(s) **[Council SPV, e.g. Leeds, Gateshead, Cardiff, Sutton, Barking, others. The only suitable option for TH and WG]**
4	Public-public partnership with joint development and financing – D&B and some functions outsourced to private sector **[Public-public JV, e.g. Exeter/DExTCo? Not a viable option to start the TH and WG projects]**
5	Public-private sector partnership with joint development, delivery and financing responsibilities **[Public-private JV, e.g. *originally* Nottingham, Sheffield, Woking (none remain as JVs). Not a viable option to start the TH and WG projects]**
6	Private sector led development and delivery with public sector commitment in elements of the project (e.g. commitment to long term heat offtake contract, plus grant funding) **[Concession Contract, e.g. Birmingham, Coventry, Leicester, Olympic Park, Citigen, etc. Not a viable option to start the TH and WG projects]**
7	*Full private sector development, delivery and financing* ***[Only ever delivered on a single site basis and so not suitable for the TH or WG projects]***

3.5.2. Option 3 is considered the only viable option to commence the projects. This aligns with the analysis in section 3.3 which shows the Council (or a Council owned heat undertaking) must take key roles. However, the option of delivering the scheme in-house (Option 2), while technically possible, is ruled out because of the level of HNIP funding which is required to make the projects attractive. HNIP is available to Local Authorities only if they set up an SPV.

3.5.3. Options 4 and 5 are not available options for initiating the scheme although they are available in the future should the Council wish to change the structure. Indeed, Options 4 and 5 are potential options for implementing later stages of the project and should be considered for the wider interconnector pipework and the potential future expansion to St Ann's/Woodberry Down through the possible use of a 'PipeCo' separate from HESCO. PipeCo could own the interconnector assets, buy heat from Energetik and sell to HESCO. The HESCO would then only be responsible for the energy centres and local area networks i.e. TH, WG etc. The reasons for this are as follows:

i. It is not considered viable for the Council acting as the scheme promoter to involve third party investors (either private sector or other public sector bodies) from the start (either as JV partners, Options 4 and 5, or concessionaires, Option 6) at WG and TH. This is due primarily to timing issues caused by the constrained delivery programme but also due to the lack of certainty/control the Council has over the customer base (typically where a third party is involved, the customer base is largely existing and ready to buy energy or there is a much clearer build out timeframe under the control of a single large developer who is therefore able to take the demand risk – it is rare for private sector investors in DENs to take demand risk. Even if the Council were to reach a point where it had sufficient control over the customer base, there is insufficient time in the programme to find a project partner before a decision needs to be taken to build the scheme in order to supply energy to customers to the required timescales)

ii. However, it is arguable that the WG and TH projects can be split into local area networks and interconnector pipework; the programme for the interconnector can be decoupled so that there are effectively two different 'start' dates.

a. WG and TH local area networks delivery needs to take place during 2023/24

b. The interconnectors that WG and TH are reliant on could be delivered in 2025/26 – they do not start until later and so could be separated into a PipeCo and the Council could defer their implementation to allow time to find a third party to (co-)invest in the interconnectors (although if the Council commences the local area network projects in 2023/24, it must also be prepared to deliver the interconnector part of the projects without third party involvement should any attempt to find a partner fall through)

iii. Additional PipeCo projects include extensions to St Ann's and Woodberry Down. The local area networks in these locations will be delivered by the respective developer for the site.

iv. North Tottenham (see 3.4.2) and PipeCo have potential to introduce third party involvement from the start

a. At NT, it is possible to conclude negotiations with Lendlease and then let a concession by novating contracts with Lendlease to an incoming Concessionaire (Option 6)

b. For PipeCo – this could be a public-public JV (tbc) or competition to appoint delivery partner

v. Involvement of the private sector needs to be considered vs. overarching objectives of the Council as set out below in the extract from the Borough Plan (with emphasis added on aspects most relevant to DENs). Furthermore, involvement of the private sector is not dissimilar to PFI-type arrangements and so the degree of investment obtained from vs. the degree of risk transferred to any private sector partners requires careful assessment (this also applies to public sector partners but is likely to be less acute).

> Borough Plan Outcome 9: a healthier, active and greener place
>
> Reduce CO2 by 40% before 2020 and begin the journey to reduce to zero by 2050
>
> We will:
> - Promote Ultra Low Emission Vehicles, such as electric cars, and where required work with partner to install electric charging points.
> - Require all new development to achieve the Zero Carbon Standard.
> - ***Improve the carbon footprints of the council's corporate buildings and work with other partners to encourage energy efficiency projects.***
> - ***Lead on the delivery of an energy network where more sustainable energy is generated for use within the borough.***
> - Develop a plan for Haringey to become Zero Carbon by 2050 ***and start on its delivery***.
> - ***Explore setting up an alternative local or regional energy savings company(s) that would serve our community by helping to tackle fuel poverty***.

3.5.4. Although Option 3 is considered the only option, it also has a number of advantages over the alternatives including:

- Council control of projects,
  - Allows prioritisation of policy goals and carbon savings ahead of financial return
  - Provides access to financial returns of heat networks
- As well as being required for HNIP funding, an SPV
  - Limits Council exposure to reputational risk to some degree
  - Limits Council exposure to financial risk to some degree
  - Aligns with Council preferences regarding the manner by which it would deliver non-statutory energy services
  - Allows for the Council to easily exit the scheme at a later date
- Council leadership across a number of DEN projects effectively provides a common delivery vehicle across multiple projects which is an enabling factor for the future expansion of the heat networks programme (and would not be guaranteed with some other delivery models)

- Council funding recognises that the substantive risks for the project are likely to remain with the Council in any event and that private sector investment is considered unlikely to represent value for money.

3.5.5. Based on the above assessment, **Option 3 - Fully public sector owned delivery vehicle with private sector delivery partner(s)** is recommended as the preferred option. As set out in Table 3.5 this approach has been used by several other public sector bodies including a number of local authorities. The key benefits of this option are summarised below as well as details of how they align with the Council's objectives:

Table 3.5 - Preferred Delivery Option

Characteristic	Description of Fully public sector owned delivery vehicle
Accountability for delivery of public value/benefit	Having a separate SPV (which is wholly, or majority Council owned), will provide clarity around the capital investment to develop the asset, costs and revenues, which will be publicly available. In addition, if the Council wanted to exit the SPV in the future, the lines of demarcation are clearer.
Investment opportunity for the public sector	While it is recognised the scheme will need significant public sector support in order to be deliverable, this can be justified in terms of the non-financial benefits. Once adequate support has been obtained, the remaining requirements will reflect an investible opportunity which can provide returns to the Council as investor.
Use of delivery partners allows risk sharing/risk transfer	As per section 3.2, the installation and operation (and potentially customer service and billing aspect of heat supply) roles will be outsourced as the Council does not have the capacity to fulfil these functions. The development of a Council owned SPV allows the Council to negotiate the level of risk shared between itself and the delivery partner(s) who will design, build, operate and maintain the system. The potential risk transfer and contracting options for these roles are discussed below in section 3.11
Ability to meet Haringey Council's strategic goals for the district energy system: e.g. reduce carbon and reduce fuel poverty.	A Council owned SPV allows the Council to influence the key success criteria and operational objectives, allowing it to specify the strategic goals of the overall project. Private sector involvement may limit delivery to more profitable parts of programme significantly reducing scope / benefits.
Ability to enable future expansion of the district energy system	As the SPV owner, the Council would be able to drive and develop new aspects of the heat network.
Enables the establishment of a coherent and more consistent brand across the borough	The use of a single SPV to deliver services across the DEN(s) and beyond, provides the opportunity to develop a DEN brand. This can lead to further financial and commercial benefits through the ability to attract and develop talent and expertise.
Possible access to a wider pool of finance in future	Given the various timelines associated with the individual DEN projects the Council is considering, with some likely to be operational prior to others being constructed, there could be a possibility for collateralising future cash flows when connections have been made. An SPV with multiple projects provides a diversification of revenue streams, reducing volatility and risk. This could present an interesting proposition for investors as the underlying risk is reduced and the financing structure can move from project finance to corporate finance. Where additional projects are then funded through corporate debt, this could be beneficial as it will reduce the reliance on local authority funding.

3.6. Detailed Delivery Structure and SPV

3.6.1. The Council-owned SPV is recommended as the most appropriate corporate vehicle for the delivery of the Programme of DENs.

3.6.2. As set out above, Option 3 could morph into Option 4 (public-public JV) with the expansion of the network and the introduction of a PipeCo in relation to the interconnectors. The public sector JV partners are likely to be neighbouring LAs who have similar objectives and would benefit from having low carbon DENs delivering heat to their areas.

3.6.3. A public-public JV would also be beneficial as being co-owners can help resolve areas of conflict in what would otherwise be a supplier / customer relationship. This arrangement will be explored further post OBC and while developing the FBC.

Company Structure

3.6.4. It is recommended that the SPV is setup as a Company Limited by Shares (CLS). This is typically a commercial company that is managed by directors and owned/controlled by shareholders.

3.6.5. A CLS is the most flexible option and allows the Council to retain control of the project whilst also offering an equity stake, if desired, to a delivery partner. It also provides the flexibility to offer stakes in the energy network(s) in the future if desired.

3.6.6. A CLS is also allowed to distribute profits without restrictions. This would allow the heat network to deliver economic benefit to the Council. State Aid rules would need to be considered; however, this mostly affects the way in which the Council lends to the delivery vehicle or provides services to it.

3.6.7. In the first instance the Council is expected to own 100% of the shares. This structure allows for the payment of surpluses as dividends to the Shareholder – i.e. the Council, or to be used for reinvestment in the network.

3.6.8. The board of directors would be appointed by the shareholders, (i.e. the Council). This approach also has the flexibility to appoint one or more non-executive directors to provide expertise to the company.

3.6.9. CLSs are easily understood structures and backed by the Companies Act 2006. A CLS can trade, raise finance, invest in or be sold to third party investors. A CLS is liable to corporation tax on any taxable profits arising within the company. Should the CLS be dissolved any surplus would ordinarily be distributed to the shareholders in proportion with their interests.

3.6.10. Other types of company structures were reviewed, one other viable option is a Limited Liability Partnership (LLP). This is discussed further in Appendix G.

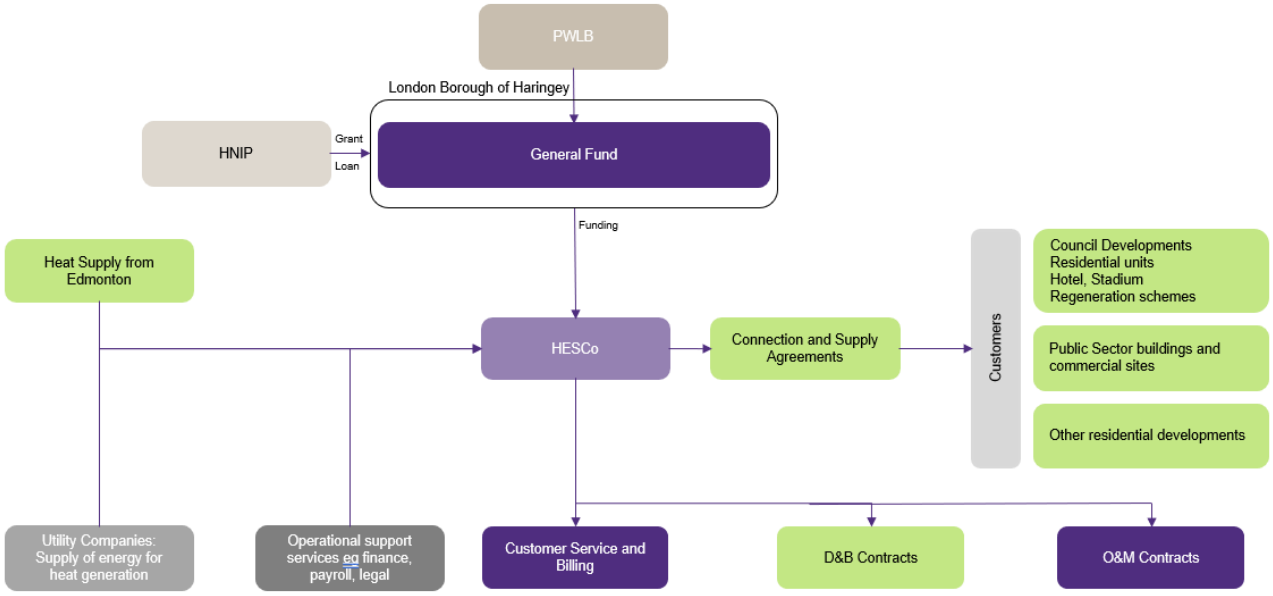
3.6.11. In principle, if the CLS was an LLP then this could eliminate corporation tax costs. However, the financial modelling currently forecasts a marginal benefit from the avoidance of corporation tax due to a lower overall tax charge over the life of the project. This is largely due to the capital allowances that are claimed, which minimises the tax charge but also delays the cashflow relating to tax payments reducing the financial benefit from tax avoided in present value terms. The option to set up as an LLP may be revisited later if there are changes in the project dynamics and a significant financial benefit can be obtained.

3.6.12. As can be seen from the above, there is something of a tension between maximising the tax efficiency of the delivery vehicle structure and minimising the complexity of the operational, contractual and regulatory structure which will be explored in the next stage of work.

3.7. SPV Structure

3.7.1. For the purposes of this OBC, the proposed SPV has been named HESCO (Haringey Energy Supply Company). Figure 3.7-1 below, provides an overview of the proposed relationships which HESCO will hold in order to operate. These relationships are key levers for enabling HESCO and the Council, to manage the risks of business operations.

Figure 3.7-1 Overview structure of HESCO and key relationships



3.7.2. As a new entity, the SPV will not have a proven track record of heat delivery, being a newly established company which is a subsidiary of the Council. Given this, it is possible that the private customers of the SPV will look to secure guarantees from Haringey Council. For major consumers there may be a requirement for a Parent Company Guarantee or an expectation that the Council will act as supplier of last resort. ".Supply of energy is a commercial undertaking and any funding from the Council (or other public bodies) to the HESCO may constitute a subsidy under the subsidy control regime which has replaced EU State aid law since 31 December 2020. Financial support may constitute a subsidy if it is provided at below 'market rate'. However, even if the financial support to the HESCO does constitute a subsidy it may be a lawful subsidy if compliant with the subsidy control principles, or in other ways under a new regime. See Appendix H for more information on Subsidy Control.

3.7.3. The HESCO articles of association would regulate the appointment of directors and matters requiring shareholder consent. This structure would be simple to administer with all decisions vested in members or officers via delegation arrangements.

3.7.4. The fact that Haringey Council is both a customer and has control of the energy supplier (HESCO) could be seen as a blurring of roles. Ideally, the Council would not have members, or the Section 151 Officer on the HESCO board – thus avoiding conflicts of interest. The Council would need to carefully consider the matters that it (as shareholder) would require approval of under the business plan of the SPV. This could include registering any other shareholding, appointments and remuneration.

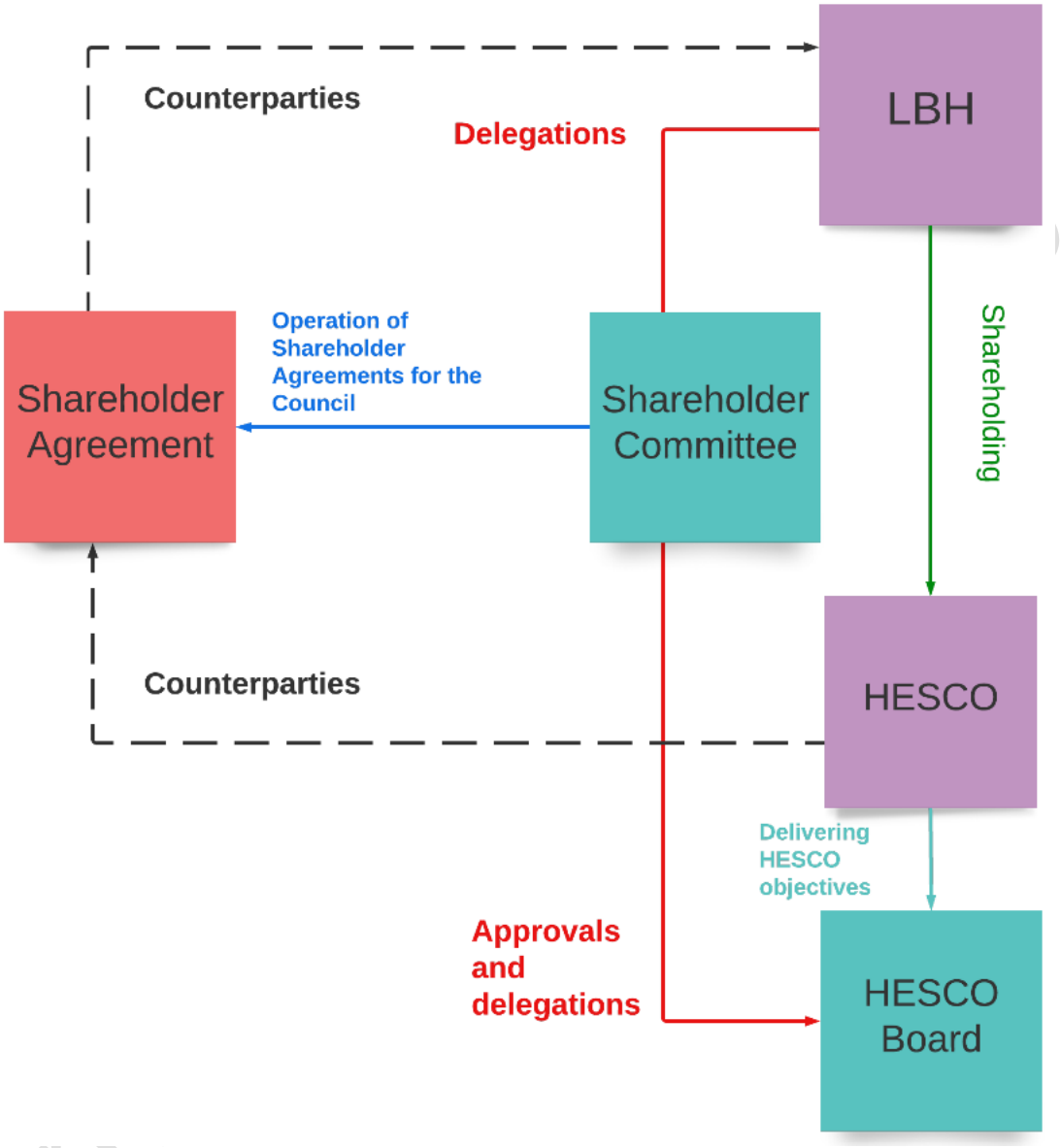
3.7.5. This structure ensures alternate options for investment and alternative ownership models are preserved for future consideration. Wholly owning the SPV also enables the Council to control whether profits are distributed or reinvested in the business.

3.7.6. It is anticipated that the DEN programme will be delivered through a single SPV structure (i.e. HESCO would own assets in TH and WG even though they are not physically connected).

3.8. Governance

3.8.1. As the Council is undertaking multiple roles, a multi-tier governance set up needs to be in place. The structure of these arrangements is laid out in the following diagram.

Figure 3.8 Shareholder relationship between Council and HESCO



3.9. Shareholder Committee

3.9.1. The Shareholder Agreement will govern the relationship between the Council and HESCO. This serves to manage and regulate the relationship between the shareholder (i.e. Council), the management of HESCO, ownership of shares and the protection of the shareholders. The Shareholders Agreement (SA) will also govern the way HESCO is run including appointment of directors and procedures relating to board meetings and shareholder decisions.

3.9.2. The Shareholder Committee is set up to assess the performance of HESCO and to provide the Board of Directors with appropriate Terms of Reference (ToR). The committee should not be concerned with operational issues but will provide the avenue via which the Council will manage its relationship with HESCO.

3.9.3. The point above is critical to the successful operation of the HESCO and the DEN Programme delivered through the HESCO being financially viable. It is crucial that the Council understands that the Shareholders' Board is the method by which it *manages its relationship with* HESCO and not

the *specific management* HESCO. Day to day management of HESCO is undertaken by the HESCO Board of directors as set out below. Blurring the lines between shareholder and company can result in a viable Business Plan not delivering returns to the Council. It is critically important that once the Business Plan and Company Policies (including specific policies on charging and debt collection) have been approved by the Shareholder Committee, the company is then left to operate these in an unfettered manner.

3.10. HESCO Board

3.10.1. The HESCO Board of Directors will be responsible for the management of the SPV, specifically delivery of the business plan and approved company policies and ensure that it remains commercially viable and financially robust. Fundamental to the successful operation of HESCO is sufficient resource to ensure the smooth operation.

3.10.2. The staffing of HESCO is still to be finalised but will include a number of contract managers and technical specialists as well as a board that can provide direction and decision making.

3.10.3. There are a number of roles that will be outsourced once HESCO is formed. While procuring the services of D&B, O&M and CSB contractors is obvious there are also several other roles that will need to be procured. These can be provided by the Council's in-house teams or by the private sector. Some of these roles may have to be TUPEed from the Council. Funding for these roles will be via HESCO's operating budget.

3.10.4. Table 3.10-4 below sets out in more detail the specific roles of the Council acting through its Shareholders Board and the HESCO's own Board

Table 3.10-4: Roles of Shareholders and HESCO Board

Council – Shareholder Board
The Shareholders Board will be concerned with objectives of the project and the performance of the HESCO, including: - Financial position of the SPV - Approving business plan / other activity outside of the business plan / delegations - Approving charging policy - Approving debt management policy - Carbon reduction - Delivery of social-economic issues like fuel poverty / apprenticeships - Customer satisfaction and complaints resolution
HESCO – Board of Directors
The Board of Directors will be responsible for day-to-day management of the SPV, ensuring that it remains commercially viable and financially robust, including: - Preparation of business plan - Monitoring cost and revenue against business plan - Developing and delivering plans for expansion - Operational issues e.g. maintenance, plant and equipment, IT systems, security of data - Stability and reliability of heat provision - Headroom available for making debt repayments - Debt and cash collection position - Customer satisfaction and complaints handling - Health and safety incidents - Audit reports

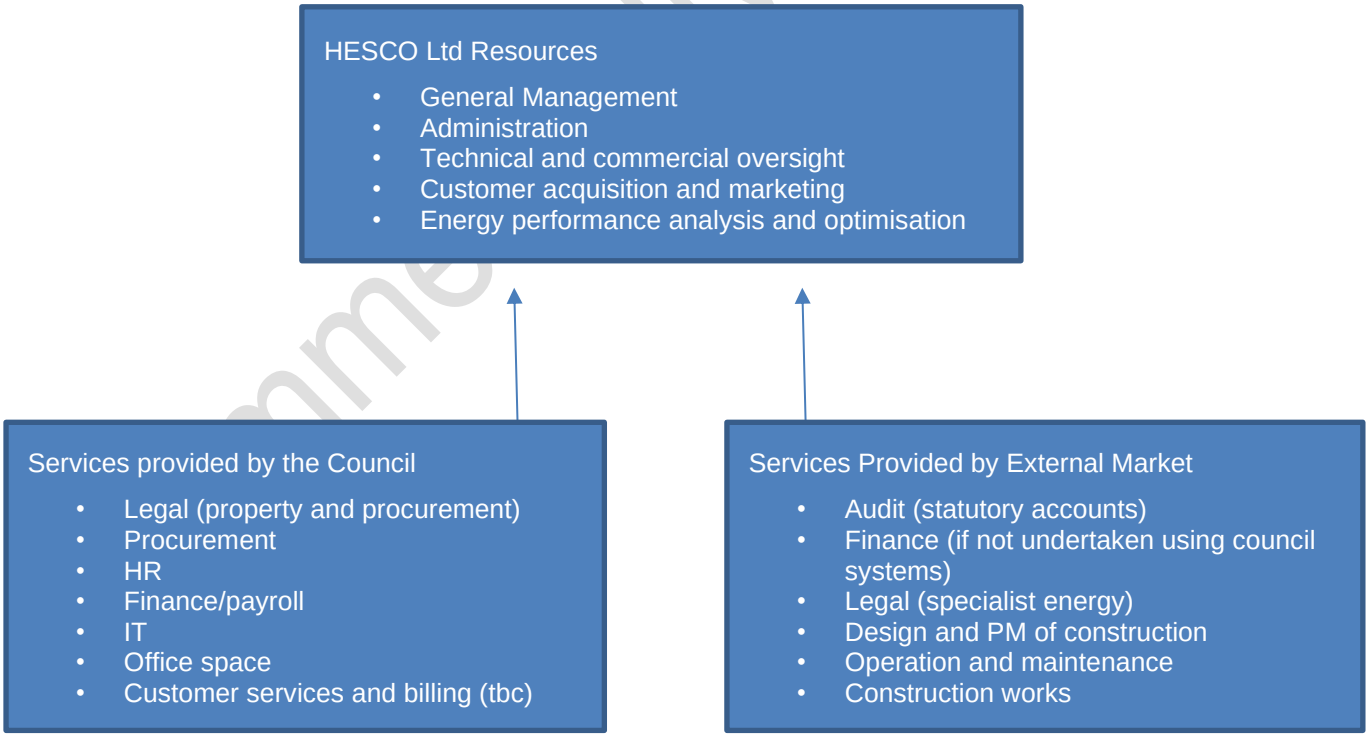
3.10.5. Table 3.10-5 shows the expected split between the roles which would be delivered by internal HESCO resources, those which will provided by wider Council resource and those more specialist services produced externally as well as comments on the arrangements.

Table 3.10-5 – Roles of Shareholders and HESCO Board

Role	Comments
Dedicated resource - Management and admin staff - Office space	- Staff would need to be hired by or transferred to HESCO - Services would have to be procured or arranged via contract with a provider (could be the Council)
Operational support: - Finance - Payroll - Legal - IT - Marketing - Procurement	Backoffice services can be outsourced or provided by the Council Service level agreements will be needed to manage these requirements Arrangements can vary dependent on availability of 'in-house' resource Where SPV ownership is shared, other shareholder demands will also need to be considered
Specialist/Periodic services - External audit - Energy reporting - Carbon audits	Some services will have to be procured as and when required due to their specialist nature and need Audit services may be tendered for on a periodic basis

3.10.6. Figure 3.10-6 provides further details on the specific roles which it is expected will be undertaken by each of these parties.

Figure 3.10-6 – Resourcing of HESCO and Services provided to HESCO



3.11. Contractual Arrangements

3.11.1. As a legally distinct entity, the HESCO will be the party that engages with the private sector for the development and operation of the networks in TH and WG. The analysis below details the most significant contractual arrangements that HESCO will enter into. See also Figure 3.10-6 above.

3.12. Operational Arrangements

3.12.1. HESCO will require a number of contractual arrangements in order to function as a heat supply business. These are summarised in Figure 3.10-6 above.

3.12.2. For some of these contracts, it is possible to aggregate them under one supplier and where possible this is recommended.

Design and Build (D&B), Operation and Maintenance (O&M) and Customer, Service and Billing (CSB) Contracts

3.12.3. Section 3.3 sets out that HESCO will outsource D&B and O&M and potentially CSB roles. It is currently proposed to break these up into separate contracts (and potentially to break the D&B role down further into packages such as energy centre building, energy centre fit-out, buried DEN network, etc.).

3.12.4. Please refer to Section 3.22.2 below(Procurement) for more detail on the reasoning behind the contractual arrangements and risk transfer being targeted.

Energy Purchase and Sale Agreements

3.12.5. There are a number of agreements that HESCO will need to enter into both to buy and sell energy. These are:

Energy Purchase

- Heat offtake from Energetik
- Services from Utility suppliers (gas for back up boilers and electricity for plant operation e.g. pumping)

Energy Supply

- Connection and Supply Agreements (C&SA) with site Developers for the connection and supply of heat to their sites. Underneath these will sit the individual commercial (CSA) and residential supply agreements (RSA) entered into by HESCO directly with end consumers once the developer's initial role (to construct the scheme, take heat during build out and then procure these subsidiary agreements) has expired

Energy Supply Agreements

3.12.6. There is one primary agreement that HESCO will use for the connection of development sites which is the Connection and Supply Agreement (C&SA). However, it has two different forms which relate to whether the supply is residential or bulk (non-residential).

3.12.7. The simplest form of C&SA is for bulk supply where HESCO's responsibility ends at the thermal substation (connection point between the DEN and the building network). In this case, heat is sold in high volume to a single customer who may be a landlord who in turn sells heat to tenants of the building.

3.12.8. For residential supply, the C&SA is the baseline agreement between the Developer and HESCO. In this case, the C&SA has residential (RSA) and commercial (CSA) supply agreements that sit under it. The C&SA sets out what heating infrastructure HESCO is responsible for (post adoption), which normally includes all parts of the on plot/site district heating infrastructure that are constructed by the Developer up to and including the HIU/meters in the dwellings.

3.12.9. Developers could be either private or the Council itself either acting as a developer, or via a developer (primarily to deliver new HRA blocks as part of the Council's housing delivery programme). These developers are required to connect to the DEN as per planning policy.

Developers are typically responsible for negotiating and paying for heat network connections and may also be acting on behalf of future occupants who will become the customers of the DEN.

3.12.10. Where the Council is buying a block from a developer, it will typically determine whether or not to buy energy from the DEN.

3.12.11. Existing buildings would typically negotiate connection and supply agreements on behalf of themselves as the occupant/operator of the building. The existing buildings we will approach to participate in the project tend to be large public facing institutions (e.g. schools, colleges, council buildings). In a majority of cases the existing buildings fall under the Council's remit, therefore simplifying the connection decision. Where existing buildings are not owned by the Council (e.g. Harris Academy) additional engagement is required to enable the connections.

3.12.12. In some cases (e.g. leisure centres), the building owner (Council) might be institutional but the occupier would be a third party (such as Fusion Leisure). Where there is an incumbent third-party occupier, negotiations would be more complex depending on length of lease and obligations within a lease. For leisure centres where operators are typically on 5-year contracts, the Council would be responsible for connection costs (an improvement to the building) and would require buy-in from current occupant on the supply contract. A commercially simpler option would be to time the DEN connection in line with the procurement of the next operator.

Heat Purchase

3.12.13. The primary source of heat for the HESCO's DEN is planned to be obtained via the proposed interconnection (of Tottenham Hale and then Wood Green local area networks) with North London Waste Authority's ERF plant at Edmonton. Officers have had initial discussions with Energetik on a heat purchase agreement over the last two years which has identified many of the key commercial aspects of the agreement to feed into preparation of the business case. During this time, Energetik has been progressing its own heat purchase agreement with the North London Waste Authority which has now been signed (and this agreement will dictate much of Energetik's commercial approach). Further information on these discussions can be found in the Management Case (Section 5.7.43).

3.12.14. Energetik is keen to sell heat to customers and so it is expected that the Council will negotiate an agreement with Energetik for heat. This is likely to be back-to-back with Energetik's own agreement with NLWA. Whilst discussions have been informal, they have identified many of the key issues. The latest status of these arrangements is set out below:

- NLWA has planning permission and has commenced preparatory works and procurement for a D&B contractor for main facility. A number of planning conditions remain to be resolved including demonstrating support to commercially viable DENs and this may provide some leverage with NLWA.
- Energetik:
    - has received funding from the GLA which requires Energetik to make a connection available to Haringey with 20MW capacity
    - has now signed exclusive heat purchase agreement with NLWA for up to 60MW of heat and therefore it effectively has a monopoly for heat generated by this facility
    - cannot practically use all of the heat within Enfield and therefore need to find customers in neighbouring Boroughs
    - has received HNIP funding which includes a condition to sell heat to Haringey at 'close to cost'
    - has planning permission for its scheme and has commenced construction
    - is actively approaching the Council's DEN team to understand opportunities and commence discussions
    - cannot offer anything it has not obtained in their agreement with NLWA e.g. guarantees (none provided), period of agreement (expected to be up to 40yrs)
- Discussions with Energetik are at an early stage but some key principles have been defined
    - The price paid by Energetik to NLWA is based on electricity income foregone by NLWA and this provides a floor in what Energetik can offer the Council
    - Availability, carbon performance and maximum temperatures are set
    - The capacity available to Haringey is capped by the size of infrastructure currently being installed by Energetik (the GLA has funded an upgrade to allow a nominal 20MW supply with zero connection cost)

- Current modelling for DEN Programme as contained in this OBC includes prudent assumptions based on the above constraints

3.12.15. Haringey will need to comply with public procurement legislation and internal standing orders when buying any energy from Energetik and a route has been identified which makes use of an exemption in the Utility Contract Regulations to allow direct negotiation (although a waiver to internal standing orders will still be required). Please see Section 3.27.11 on procurement. The Council's Contract Standing Orders, Procurement Code requires a waiver from Cabinet to use this exemption and award a contract and the waiver will be sought as a part of the FBC. Negotiation can commence in the meantime.

3.12.16. The approach to progressing the discussions to formal agreement is set out in the Management Case (Section 5.7.43).

3.12.17. Note that the heat supply from the ERF (of up to 20MW) is not intended to supply all of the heat for the DEN as the peak capacity when fully built out is likely to be around 60MW and the ERF will require regular downtime for maintenance. The local energy hubs therefore house natural gas boilers which will provide top-up heat in cold weather and are capable of supplying the full heat load for periods of ERF maintenance. The ERF will supply around 90% of the heat.

3.12.18. Indeed, heat supplies from the ERF are not expected to come online until 2025/26 whereas the local networks are expected to start operating in 2024. This means the link from Energetik's network to the energy hubs in Tottenham Hale and Wood Green is not on the critical path and there is more time to deliver this part of the project.

Utilities Supply

3.12.19. Although the primary source of heat for HESCO is the NLWA ERF, there is a need to provide back up and top up heat supplies when this is offline as well as energy for pumping heat around the network. The back-up supplies of heat will come from conventional gas fired boilers located around the network. Therefore HESCO will need to put in place contracts with utility suppliers which it is expected will be procured through the Council's existing arrangements via the Laser framework.

Support Arrangements with the Council

3.12.20. In order for the HESCO to start trading and be able to operate, the Council and the HESCO will have to enter into a number of agreements. These will include arrangements for funding (loan), staffing and administration. In addition, any contracts entered into by the Council involving the DEN will have to be novated to the HESCO.

3.12.21. This could include some arrangements which constitute procurement by HESCO e.g. for legal, accountancy, procurement or HR support to be provided by the Council. Any such procurement is likely to be of low value and not subject to public procurement rules.

3.13. Financial Arrangements

3.13.1. The Council's provision of finance to HESCO for the TH and WG projects will come from a range of sources which are either on granted or on lent from the Council to the HESCO. The sources available to the Council include PWLB, CIL, s106 agreements, HNIP Grants, HNIP Loans, etc. The figure below provides a summary of these lending arrangements (MEEF is the Mayor's Energy Efficiency Fund, a potential source of borrowing by the Council).

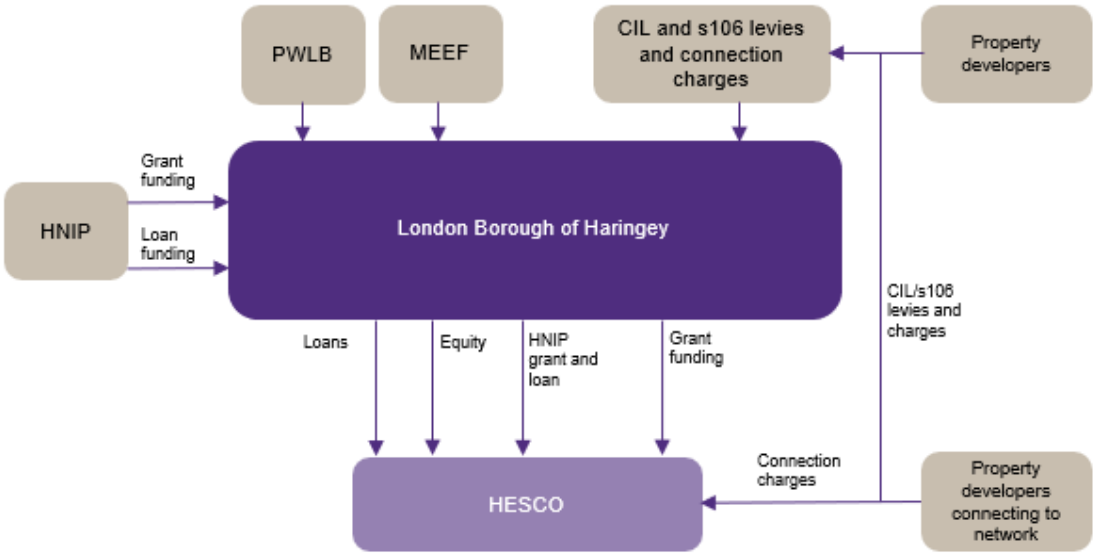


Figure 3.13-1 - Funding Sources

3.13.2. Note that the proposed funding strategy for the project is discussed in detail in Section 4: Financial Case

Subsidy Control[16] Considerations

3.13.3. The Council recognises that this project has Subsidy Control implications and has sought advice which can be found in Appendix H - this currently shows that the proposed project is capable of being compliant. Although this will be monitored as the project progresses in the event of any significant change which may impact this assessment.

3.13.4. The following potential areas of aid will be assessed through commercialisation to ensure this current view remains the case, i.e.

- HNIP (and other grant schemes e.g. Green HN Fund, ERDF, Housing Infrastructure Funds)
- Community Infrastructure Levy (CIL)
- ECO (this is a market payment from an energy company to the council for helping them meet their obligation to reduce domestic running costs in existing buildings)
- Connection charges as set out in s106
- Leases from the Council to HESCO
  - In Wood Green, the developer is obliged to lease the EC to the Council for peppercorn – the Council will sublease to HESCO
  - In Tottenham Hale, it is proposed HESCO will lease low value land from the Council for a peppercorn and will then develop the EC on this land
- To benefit from the Council's statutory land rights (which have a value), HESCO may pay the Council to build pipes on its behalf if the Council leases back to HESCO for peppercorn
- Finance from the Council: equity if returns are lower than normal / soft loans at below market rates
- Parent Company Guarantee from the Council to HESCO
- Other services from the Council to HESCO e.g. free accommodation for HESCO staff at the Council offices, legal and procurement advice from the Council staff to HESCO, use of the Council contracts (gas and electricity, etc.)

[16] Subsidy Control has replaced State Aid since 31/12/2020.

[redacted]

3.13.6. In applying the subsidy Control principles it would be prudent to consider the requirements of GBER Art 46; the system must be an energy efficient district heating and cooling system. The Council anticipates that both the general conditions and the specific requirements under GBER would have been satisfied had they applied. For example, it is estimated that >90% of the heat delivered by the project will be sourced from the ERF.

3.13.7. The former GBER rules about the quantum of allowable aid do not directly apply, although they may be used by HNIP as a guide to allocation of grant.

3.13.8. While the preliminary analysis of the quantum of aid considers only the major sources (loans, CIL and HNIP) it is likely to increase once more minor sources of potential aid are included (e.g. future GLA DEEP funding etc).

3.13.9. The UK ceased to be subject to the EU rules directly after the end of the Transition Period on 31 December 2020New arrangements were agreed in the UK/EU trade and co-operation agreement which amongst other things has introduced a subsidy control regime which now applies in the UK. It is being amplified and updated by the Government's subsidy control bill currently before parliament.

3.13.10. The amount of Subsidy and Subsidy Control compliance is reviewed under the Financial Case (Section 4.1.4).

3.14. Access and Permission Agreements

3.14.1. The DEN networks cross a large geographic area, and on occasion need to cross or be built in vicinity of existing infrastructure. In order to construct the DEN, various permissions will be required. These will require agreements, which HESCO/ the Council will need to enter into. These are further described in the management case (Section 5.8). The entities that we will need to seek agreements with include:

- Network Rail
- Council - Highways Service
- Council - Planning Service (including Environmental / Pollution Services for ground works)
- Environmental Agency
- TfL (where bus routes may be impacted).

3.14.2. Alongside formal agreements and permissions, the DEN programme will work closely with other key stakeholders to develop and ensure safe delivery of the DEN network. These include Tottenham Hotspurs Football Club so that crowd control and pipe installations do not conflict, and other council services that are key users of the road network (e.g. Waste Services).

3.15. Ownership and Property Arrangements

3.15.1. The DEN network can be broken down into distinct constituent parts.

3.15.2. Simply put, the ERF is at the heart of the network and Energetik have arranged to take heat from the ERF and are building a network of buried pipes to the Haringey border.

3.15.3. A pumping station will need to be provided (on Council land) close to the interface with the Energetik network to provide additional impetus to circulate water through an 'interconnector' network of buried pipes between Enfield and neighbourhood scale energy centres at various locations in Haringey.

3.15.4. The energy centre buildings are expected to be either on Council land or provided by a developer to the Council as part of a planning/development agreement with a suitable lease. The energy centres will house boiler plant, thermal stores (to accumulate heat supplied from the ERF to be discharged at peak periods), more pumps and other ancillary equipment.

3.15.5. There is then a local network of buried pipes between the neighbourhood scale energy centre and customers.

3.15.6. Buried pipes are considered as 'primary network'. The buried interconnector network for the TH and WG projects is anticipated to be exclusively within either the public highway or Council land. The vast majority of the buried neighbourhood network is expected to be within the highway or Council land or within customers' land. The exception is the proposed link to Alexandra Palace in Wood Green which is likely to require agreement to cross Network Rail and Thames Water land (because available routes following the public highway are prohibitively expensive).

3.15.7. Where the buried/primary network reaches buildings, a hydraulic break is provided between the buried network and the buildings above ground heating system in the form of a substation. This is to manage system pressure and/or to provide a clear demarcation in ownership.

3.15.8. The above ground system in many customer buildings (which are mainly residential buildings[17] but this may also apply to non-residential or mixed-use buildings) will then comprise a secondary network linking to multiple customers in the building. Some buildings (typically non-residential but could apply to houses) will have only a single customer and there is no secondary network.

3.15.9. Where there is a secondary network, the final connection to a customer is via a Heat Interface Unit which, again, provides a hydraulic break primarily to manage ownership responsibility (but also to limit potential leaks within customer demise which can be difficult to access).

3.15.10. The ownership arrangements for the constituent parts is set out in Table 3.15-11 below.

3.15.11. Note that in many cases the ownership proposes the Council initially with a transfer to HESCO. The rationale for this is explained in paragraphs 3.16.14 to 3.16.25.

Table 3.15-11 Ownership arrangements

Component of Scheme	Description	Ownership Arrangements	Operated and maintained by
ERF [note this is outside of the OBC]	The Energy Recovery Facility at the Edmonton EcoPark that supplies	NLWA / LEL	LEL's contractor tbc
Energetik/primary network [note this is outside of the OBC]	Buried network including valves, controls ducts, etc.	Energetik / Enfield Council	Energetik's contractors (Vital Energi tbc)
Pumping station	Small plant room location on Council Land	HESCO	HESCO's O&M contractor
Interconnector/primary network	Buried pipe downstream from Energetik but upstream from each Energy Centre	Initially Council then transferred to HESCO	HESCO's O&M contractor
Energy Centre – TH	New Build Energy Centre adjacent to flyover	HESCO (building) – land on which EC constructed leased to HESCO by Council	HESCO's O&M contractor
Energy Centre – WG	Energy Centre on St William site	HESCO (by lease sublet from Council) – building owned by developer initially	HESCO's O&M contractor

[17] Including many Council housing buildings

Component of Scheme	Description	Ownership Arrangements	Operated and maintained by
Energy Centre, primary network, HIUs and tertiary networks – Broadwater Farm [all existing]	Entire scheme at BWF	Council (HRA) [1]	Council's O&M contractor (same O&M contractor as HESCO but under different contract)
Local/primary network – in highway	Local area heat network between energy centres and customer buildings	Initially Council then transferred to HESCO	HESCO's O&M contractor
Local/primary network – in customer land	Local area heat network between energy centres and customer buildings	Initially developer until HESCO is set up then HESCO (unless HESCO not set up in which case Council)	HESCO's O&M contractor
Local/primary network – in Council Land	Local area heat network between energy centres and customer buildings	Initially Council until HESCO is set up	HESCO's O&M contractor
Local/primary network – in private Land	Local area heat network between energy centres and customer buildings	Initially Council then transferred to HESCO	HESCO's O&M contractor
Substations/Commercial points of connection	The thermal break between the local area network and each building (some buildings contain multiple customers connected by a secondary network, some buildings contain a single customer)	HESCO	HESCO's O&M contractor
Secondary network in new build – primarily bulk supply to residential blocks [including to any HRA blocks]	The entire heat infrastructure within residential buildings up to and including HIU	Developer/building owner [including Council (HRA)] [1]	Developer/building owner's O&M contractor [where this is HRA, this is the Council's O&M contractor which will be the same O&M contractor as HESCO but under a different contract]
Secondary network in new build – primarily residential metering and billing by HESCO	The entire heat infrastructure within residential buildings up to and including HIU	Developer	HESCO's O&M contractor
Tertiary networks	Heating systems in the dwelling after the HIU	Individual property owners	Individual property owner [including HRA, note tertiary systems are normally landlord's reserved property in leases]

Component of Scheme	Description	Ownership Arrangements	Operated and maintained by
Non-residential building heating systems	The building heating system after the commercial point of connection	Building owner	Arranged by occupier/owner

Note [1] – there are several Council housing blocks (within the HRA) that are proposed to connect to the DENs in TH and WG. The heating systems serving these blocks are currently operated by the Council's in-house heat supply business. HESCO will provide a bulk heat supply to these sites which will continue to be operated by the Council. [redacted]

3.16. DEN Buildings (Energy Centres and Pumping Stations)

3.16.1. The Council has powers to establish and operate generating stations (i.e. Energy Centres) and construct associated works for the conveyance of heat (i.e. pumping stations).

3.16.2. The proposals under consideration in this Outline Business Case include:

- A pumping station near the border with Enfield;
- An Energy Centre beneath/adjacent to the Watermead Way flyover in Tottenham Hale (figure 14.6-4; and
- An Energy Centre in Wood Green.

3.16.3. The first two of these buildings are on Council land:

3.16.4. In order to distribute the heat from the Energetik network an intermediate pump station is required to be installed close to the LB Enfield / Haringey boundary. It is proposed to locate this small building approximately the size of a single garage adjacent to the Highway on land that is Council owned as shown in Figure: 3.16-4 and 5 below.

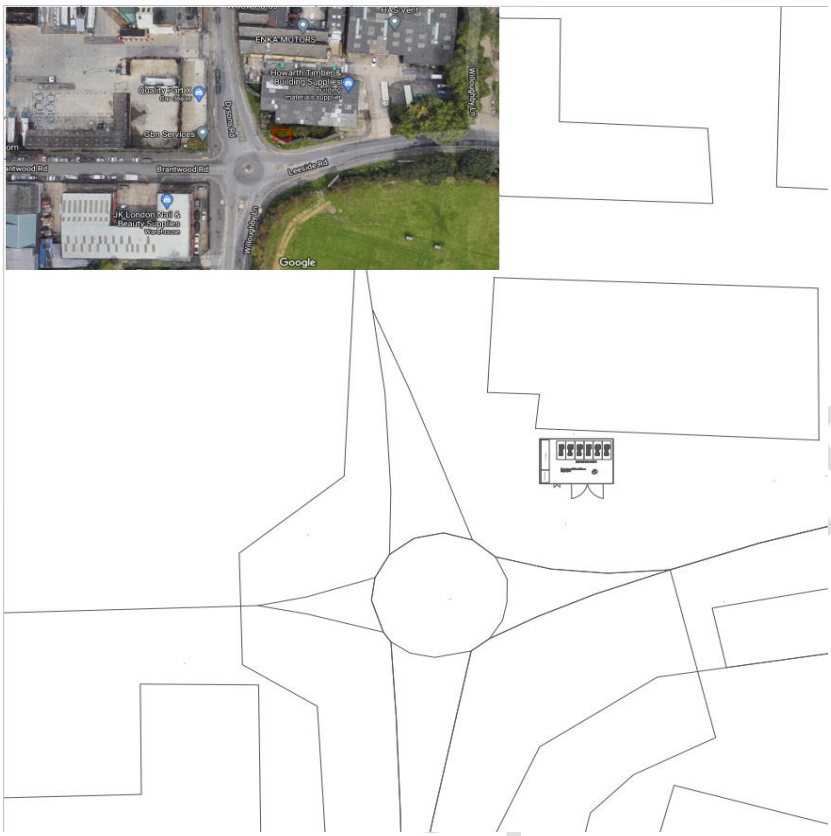


Figure: 3.16-4: Location of pumping station adjacent to Elm Lea Trading Estate at junction of Leeside and Dyson Roads (red box indicates pumping station location)

Figure: 3.26-5: Location of pumping station (purple rectangle) adjacent to Elm Lea Trading Estate (red area indicates council ownership)

3.16.5. The pumping station has been provisionally sized to export the full 20MW capacity available to the Council and Hackney and is expected to be c. 30m^2 and expected to fit on land behind advertising

hoardings located adjacent to the Elm Lea Trading Estate. The pumping station is considered likely to fall within Local Authority permitted development rights.

3.16.6. The Tottenham Hale Energy centre is to be a newly constructed Energy centre, designed to house; peak and back up boilers for the core Tottenham Hale site, heat exchangers for hydraulic separation between the interconnector and local networks, ancillary plant, and 275m3 of thermal storage to maximise the utilisation of the ERF heat.

3.16.7. The building is proposed to be a single storey portal frame type construction. The precise design is to be confirmed (a consultation and planning application will be required). Two alternative visualisations of the Energy Centre are set out in Figures 13.16-10b and 3.16-10c below.

3.16.8. There are pros and cons to the two options. The option to install the energy centre entirely adjacent to the flyover is simplest from a Highways consent and land ownership perspective and is also lower risk and lower cost. However, it is more intrusive and has greater impact on the surroundings and so is considered to have greater planning risk.

3.16.9. Installing some of the plant under the highway is possible. This could be less active plant e.g. thermal stores or meeting rooms. However, there are issues with this in terms of integrating with the bridge structure to ensure there are no impacts on the bridge and maintenance is not compromised.

3.16.10. The EC will be located in wholly owned Council (highways managed) land, see Figures 3.16-10a, b and c. There are a number of factors that will need to be taken into account before the location of the Energy Centre is finalised including: (i) the highway status of the Council's land; (ii) whether any highway use will need to be stopped-up to allow the construction of the Energy Centre (pursuant to provisions in the Town & Country Planning Act 1990 or the Highways Act 1980 (as appropriate)); (iii) whether the land just needs to be re-designated or appropriated to an alternative use; and (iv) whether any works could be carried out under licence pursuant to Section 50 of the New Roads and Street Works Act 1991. The planning process should identify and secure any access to the flyover that may be required by the highway authority for maintenance purposes, if any part of the Energy Centre is proposed to be located underneath or adjacent to the flyover.

Figure 3.16-10a: Preliminary 3-D visualisation of Tottenham Hale Energy Centre Adjacent to Flyover

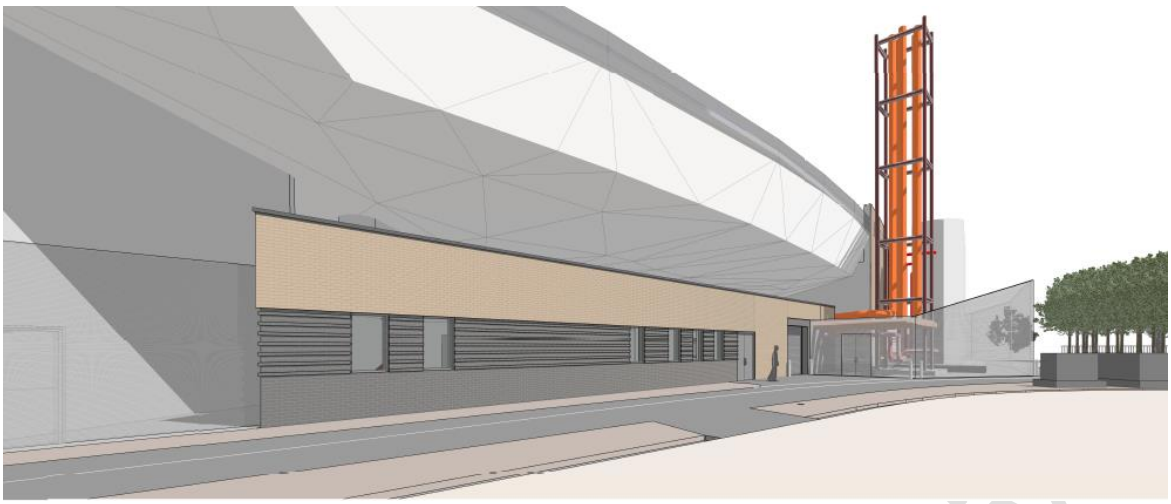
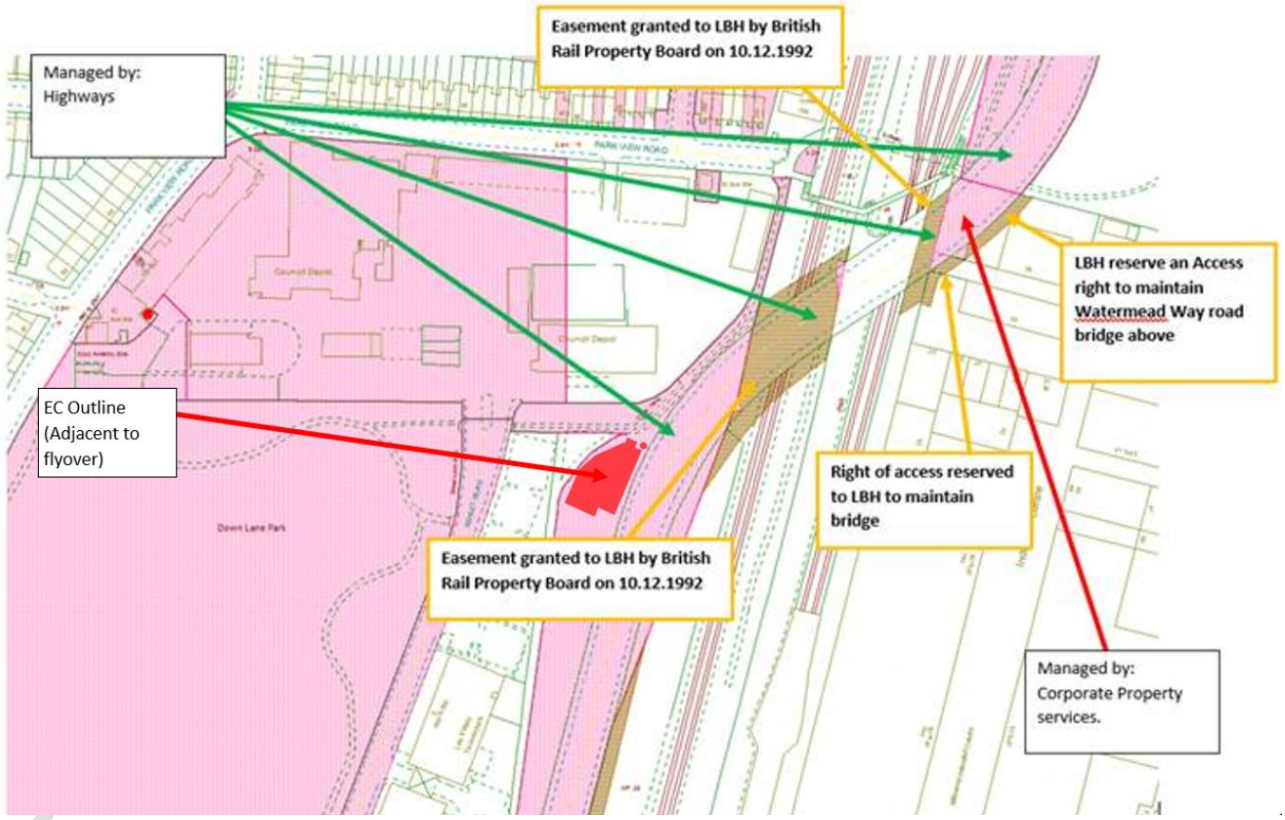
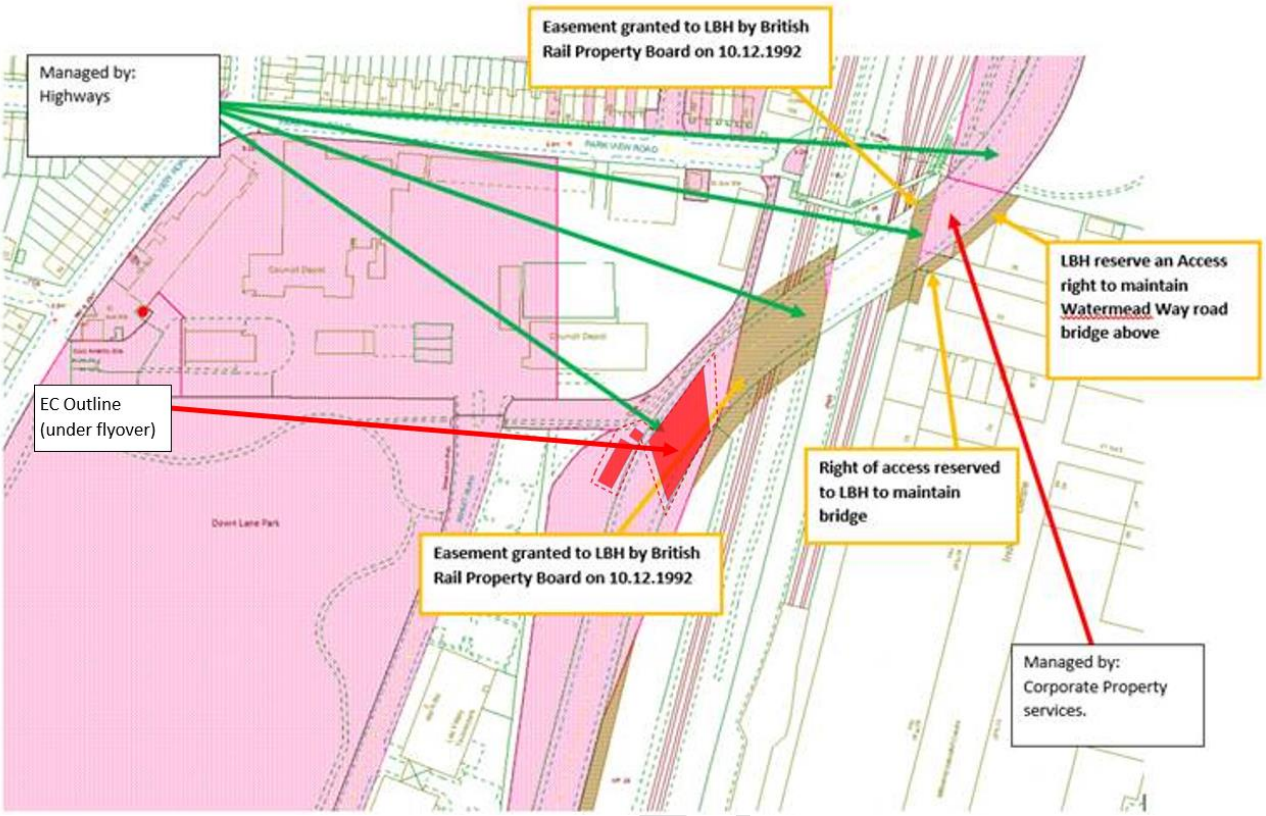


Figure 13.16-10b: Preliminary 3-D visualisation of Tottenham Hale Energy Centre Under and Beside Flyover

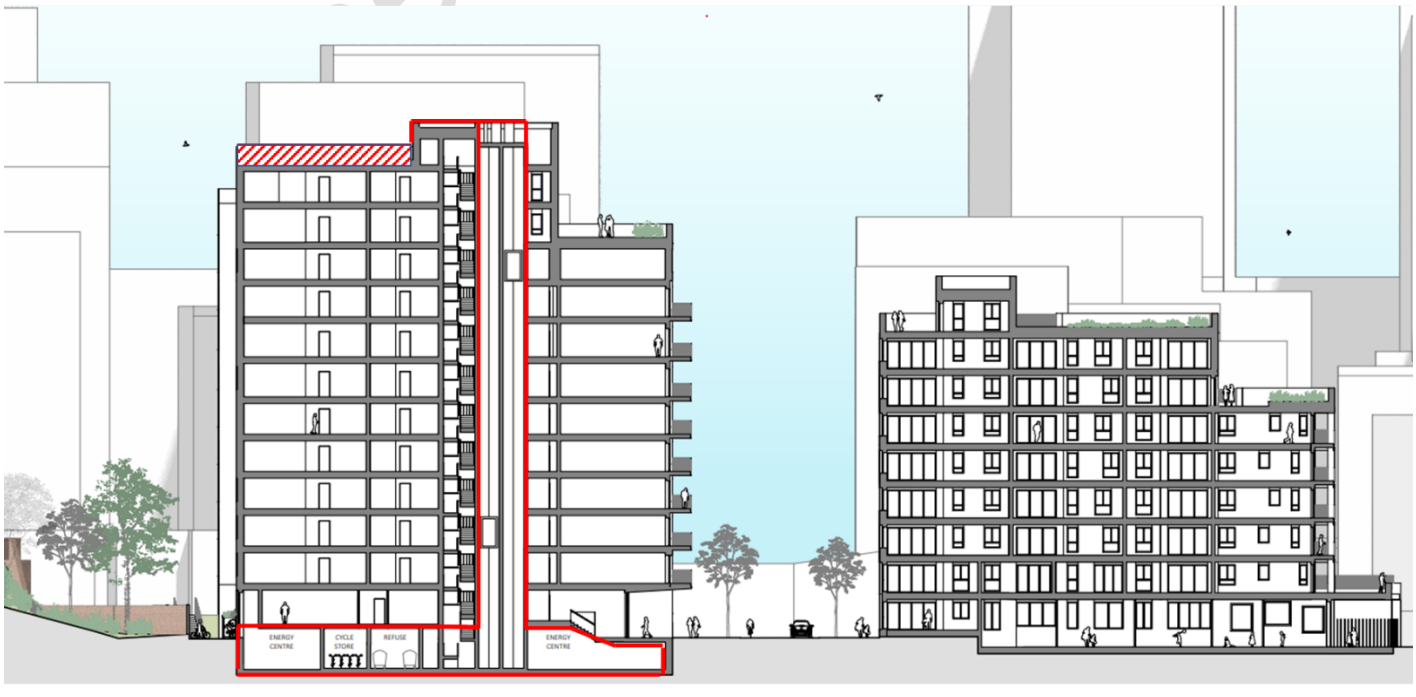
Figure 3.16-10c: Location of Tottenham Hale Energy Centre (red polygons) beneath and/or adjacent to Watermead Way flyover (pink shaded area indicates Council freehold)





3.16.11. The energy centre in Wood Green is on developer land and is shown in Figure 3.16-11below. The Council may seek delivery of energy centre buildings on developer land through agreements with developers (e.g. planning agreements, as is the case at Wood Green or development agreements, as per the proposal in the North Tottenham OBC).

Figure 3.16-11: Section through the Wood Green Energy Centre in Building D4 of the Clarendon Square development – red outline shows indicative area to be leased to the Council



3.16.12. The Energy Centre (EC) at Wood Green is an example of how the Council can obtain an energy centre via a s106 agreement. The agreement for the Clarendon Square development obliges the developer to provide an energy centre within the scheme. To facilitate this the Council will need to enter into a lease agreement with St William (the developer) to fitout and use this EC including laying utilities to/from the space. This is already established through a parallel planning obligation on the developer to enter into a lease. The lease itself will be developed during the next stage of work (the s106 states timelines around when the developer must enter into negotiations with the Council and issue the lease which are triggered by how they progress their development and these have not yet been triggered).

3.16.13. The figure 3.16-11 above gives an indication of how the energy centre will look. It is housed in the basement and ground floor of a new building (with existing planning permission) and while there will be louvres and some other infrastructure at ground floor, it is incorporated into the wider built environment. insert here – drawings of StW Energy Centre and explanation of the additional functionality/cost.

Buried Network in Highways Land/Council Land

3.16.14. Advice from Bevan Brittan (the Council's legal advisors) is that the Council has a statutory power to place or maintain apparatus in a street (including breaking open the street to install and maintain heat pipes) without the consent of any owner of the subsoil beneath the street.

3.16.15. However, the HESCO does not have these statutory powers and therefore would require the consent of the relevant highway authority and any subsoil owners to break open the street to install and maintain heat pipes.

3.16.16. It would also likely to be necessary for the HESCO to obtain landowner consent from any subsoil owners even in a situation where the Council had relied on its statutory powers to install the heat pipes and then the Council had subsequently transferred ownership of the pipes to the HESCO.

3.16.17. There are a range of potential options by which HESCO could secure the necessary landowner consents. The most straightforward option would be for the HESCO to agree appropriate easements and wayleaves with the landowner. However this may not always be possible (if, for example, the identity of any subsoil owner is unknown). Alternative options could include:

- the Council relies on its CPO powers to acquire the necessary property rights and then transfers those rights to the HESCO;
- where the owner of the subsoil is unknown, an application could be made to the Land Registry, in reliance on a principle known as the 'medium ad filum presumption' (essentially that the Council has a presumed ownership of the subsoil), and obtain insurance against the risk that this presumption may be incorrect; or
- the Council could install the pipes in reliance of its statutory powers and **retain ownership and control** of the pipes, and then agree a contract with the HESCO which allows the HESCO to use the pipes. It may be possible for HESCO to undertake this role without the HESCO requiring landowner consents. Further consideration would be required to ensure that the HESCO's role in this situation would not stray over into one that involved the transfer of a degree of property interest and/or control to the HESCO in way that resulted in the need for the HESCO to obtain landowners consents.

3.16.18. It is also possible that, in the future, the statutory powers currently held by the Council to install and maintain assets in the subsoil beneath a highway could be extended to other organisations (potentially such as the HESCO) that build or operate heat networks. This possibility is contemplated in the Government's *"Heat Networks: Consultation on Market Framework*" document published in 2020.

3.16.19. Further consideration would therefore be required at the commercialisation stage regarding the requirement for landowner consent in respect of HESCO's potential role in installing and maintaining the pipes.

3.16.20. There are a range of potential options by which HESCO could secure the necessary landowner consents.

3.16.21. See Appendix I (Legal considerations regarding laying pipes and breaking open the street) for further details.

Buried Networks in Private Land

[redacted]

3.16.26. While the Council does have compulsory purchase powers, under section 13(1) of the Local Government (Miscellaneous Provisions) Act 1976 Act, to acquire rights over third party land, consent would have to be obtained from the Secretary of State. The standard compulsory purchase process can take 18-24 months to conclude, which is programmatically challenging.

3.17. Heat Pricing Strategy

3.17.1. HESCO's business will be the supply of low carbon heat to customers across the various DENs. This section details how (and on what basis) the cost of heat has been assumed to be charged to residents and businesses in this OBC.

3.17.2. There is scope to change the proposed charging although this will have financial implications. The Council will have control over this through Cabinet (unless delegated to officers) prior to FBC. Post FBC, changing charges will be more complicated as a number of contracts will have been signed and the financial implications will be increased as the Council will already have invested. It is assumed the charging strategy would be subject to shareholder approval (i.e. Council as shareholder).

3.17.3. The OBC has modelled the sales of heat by the HESCO to a range of customers. These include primarily housing sites (a mix of private sites and HRA sites with both tenants and leaseholders) but also non-residential sites. It is important to understand the core principles used when determining HESCO's assumed charges which are common to all sites. These are:

a) The total charges for heat supply from HESCO will be no more than the costs that would have otherwise been incurred by the building owner/occupier for heat supplies from the cheapest long-term alternative and permissible system on a whole life cost basis.

b) HESCO's charges will also vary from site to site because the cheapest long-term alternative and permissible system varies from site to site (e.g. an individual air source heat pump (ASHP) in a new building or a communal gas boiler in an existing block)
c) HESCO's charges will be split[18] between the building owner / landlord and the occupant(s) and reflect how the costs of alternative heating systems would have been shared
d) The share of HESCO's charges payable by the occupant will reflect energy costs and will vary with consumption. They will be structured as a fixed charge (£ per month) and a variable charge (£ per unit of energy used)
e) The share of HESCO's charges payable by the building owner reflect that often a building owner is legally obliged to provide and maintain heating infrastructure on behalf of occupants. It will be structured as a fixed cost (i.e. independent of energy use)
f) The charges will change over time as the e.g. If the cost of gas increases, charges will also increase
g) The HESCO model and charging will not differentiate between Council sites and non-Council sites.

3.17.4. The first principle of the HESCO charging is to ensure that the charges will be no more than the costs of the cheapest long-term alternative and permissible system on a whole life cost basis. This is assumed to be as follows for different buildings:

- For existing buildings, the cheapest long-term alternative and permissible system is the existing heating system, and the associated running costs which are often relatively low, will be known. All of the existing buildings proposed to connect to the DEN (whether residential or non-residential) currently rely on larger commercial sized gas boilers (communal gas boilers in residential buildings). It is challenging to supply energy from the DEN at a lower cost than available from larger gas boilers. In this instance the HESCO will therefore work to match these costs but will only offer to sell energy to customers where a commercial case can be made to do so.

- For new buildings (where all of those proposed to connect are residential buildings), the cheapest long-term alternative and permissible system is an individual Air Source Heat Pump (ASHP). This would be the alternative system required by planning if not connecting to a DEN. Note that this also applies to some recently constructed residential buildings where, because the DEN is not yet available, the planning approval has allowed installation of communal gas boilers on condition that the building connects to the DEN if a viable offer is made. ASHPs have a higher overall cost of heat and so there is scope to offer a reduction from the DEN.

3.18. Heat Charges to Residential Consumers

3.18.1. HESCO has two options for supplying residential blocks. It can either:

a) Supply to the person operating the heating system in the block who will then sell energy on to residents (this is assumed to be, and frequently is, the landlord although there could be another body acting as the intermediary between HESCO and residents); or

b) Reach agreement with the building owner/landlord to use the building heating system to supply direct to residents.

3.18.2. The first option will be used in the following situations:

- In any Council residential building (existing and new) [redacted]

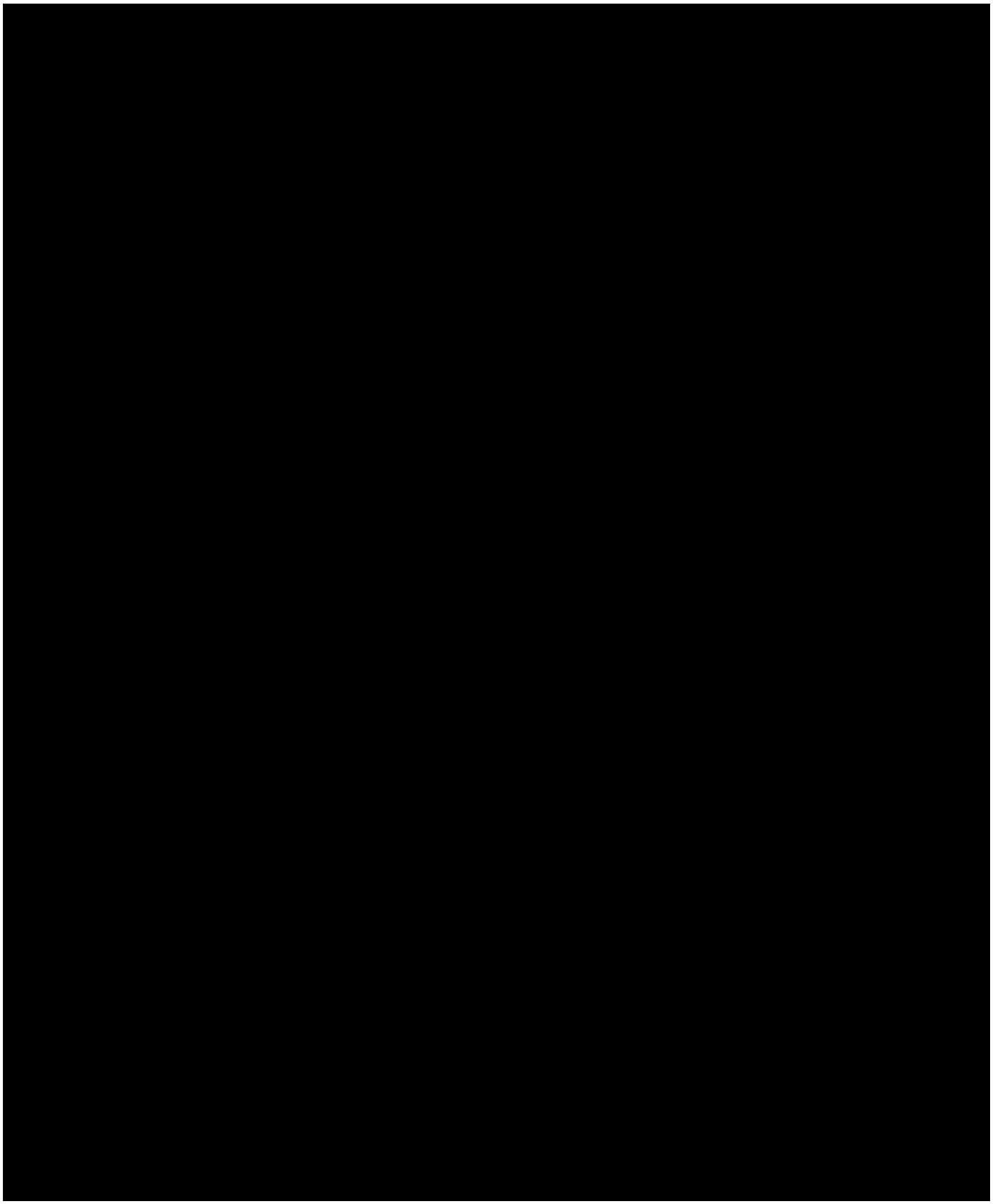
- In any existing residential building as changing the arrangements within the block will be constrained by existing legal arrangements.

[redacted]

[redacted]

[redacted]

[redacted]



[redacted]

3.19. Heat Charges to Commercial Buildings (non-residential)

3.19.1. All of the commercial buildings proposed to connect are large existing buildings with large commercial boilers (as opposed to small commercial units within residential buildings which are discussed in 3.18.23 above).

3.19.2. For existing commercial consumers it is proposed that charges are set fundamentally on the same basis as above, to match avoided whole life cycle costs. However, because the cost base faced by larger customers varies on a site-by-site basis charges will vary on a site by site basis also. In addition, some larger existing sites will be expected to retain their existing gas boilers and some will not (meaning the DEN allows the building to avoid the cost of maintaining and replacing boilers going forward) and this will also need to be reflected in pricing.

[redacted]

3.20. Indexation

3.20.1. Once tariffs have been set, it is important to define how these will change over time, reflecting the changing costs of energy, materials and labour. The assumed approach is that fixed charges will be indexed according to CPI and variable costs will be indexed against wholesale gas costs although the precise approach will be explored further as the project moves to FBC. Note also the potential unhedged risk described in 3.18.10 and 3.18.11 which will need to be monitored.

3.21. Procurement Strategy

3.22. Procurement Overview

3.22.1. The analysis of the various roles in Section 3.3 showed that the installation and operation aspects of delivery of the projects should not be undertaken by the Council. It also identified the potential to outsource the billing aspect of the Heat Sales role to Homes for Haringey and that the project would need to purchase the majority of its heat from Energetik.

3.22.2. The Procurement Strategy across the programme of DEN projects responds to these roles and seeks to achieve the following:

- **Compliance:** All procurement activities are likely to exceed thresholds for relevant Procurement Regulations. Contracts procured by the Council should comply with procurement guidelines over and above the regulations. It is expected HESCO will have similar standards (which will need to be defined and agreed by Cabinet as part of the work to set up HESCO).
- **Timescales:** The process must support the proposed delivery programme for the relevant DEN.
- **Flexibility:** The scope of contracts must be flexible enough to allow amendment, expansion and change
- **Value:** Must deliver value for money
- **Risk transfer:** Ensure that a range of risk transfer options can be tested and costed to allow the best value approach to be identified.

3.22.3. In addition to the large new DENs proposed at TH and WG, the Council is considering a further large new DEN at North Tottenham. Elsewhere within the Council's HRA portfolio there is an existing large network serving 11 blocks and 2 schools at Broadwater Farm and around 30 smaller networks serving single buildings and is in the process of acquiring around 10 smaller new networks. Where possible, the procurement strategy for service supply to the HESCO will be flexible enough to take these areas into account. Further legal input into the development of the procurement strategy can be found in Appendix J – Procurement Advice (Legal).

3.23. Timing of Entering into Contract / Set up of HESCO

3.23.1. There are a number of key factors to consider in relation to the timing of establishment of HESCO and entry into contracts, and this section summarises some of those key factors.

Establishing clear decision-making responsibilities between the Council and HESCO

3.23.2. If HESCO is set up too early, then company-level decision-making (through the Council, as shareholder, and the HESCO directors) will to some extent run in parallel with the Council's project board arrangements, with the risk of duplication and wasted effort increasing. However, if HESCO is set up too late, then the company's directors will be inheriting a corporate, financial and contractual structure for which they have limited responsibility. The project timeline should actively target a point in time when certain decisions are delegated to the HESCO directors rather than the project board and for that to happen, HESCO should at least be incorporated and the HESCO directors formally appointed to office.

Process for agreeing HESCO contracts

3.23.3. Some of the contracts required by HESCO to deliver the projects have a long lead-in time to procure. Indeed, the procurement/negotiation of some has already started and the remaining contracts need to start procurement imminently.

3.23.4. As the HESCO does not exist yet, this activity must be commenced by the Council. In doing so, the Council must be clear that HESCO will be the eventual contracting party e.g. by stating in the procurement that the contracting party will be either the Council or HESCO and, if it is the Council, that the intent will be to novate to HESCO.

3.23.5. Although the precise timing for set-up of HESCO will be considered as part of a report submitted to Cabinet on the design of the HESCO structure and governance, HESCO is not expected to exist until mid-2022 at the earliest. Forming HESCO around this time, when the projects will still be in the midst of commercialisation, would allow HESCO to take on responsibility for finalising procurement and

contract negotiation (as noted above under the previous heading). In this case, the FBC submitted to the Council for final approval of the projects could be submitted by the Board of HESCO to the Council as shareholder. This would give more ownership of the FBC to HESCO directors.

3.23.6. The set-up of HESCO will include agreements between HESCO and the Council which will cover areas such as i) novation of existing contracts, such as those for consultancy services (e.g for any consultants delivering commercialisation work if HESCO is set up during commercialisation phase), to HESCO ii) transfer of any completed assets to HESCO (with collateral warranties see 3.25.2), and iii) the Council providing support to HESCO through planning policy

3.23.7. If HESCO were set up in mid-2022, it would also see the commercialisation budget being transferred from the Council to HESCO to fund the remaining commercialisation activity. This could be accompanied by a Commercialisation Business Plan setting out the tasks, budgets, and timescales that HESCO will be expected to deliver, in this way, HESCO would be obliged to take ongoing procurement workstreams to completion and to prepare a FBC/ Construction Business Plan. The Commercialisation Business Plan would also act as a constraint on the HESCO Boards' delegated authority.

3.23.8. If this opportunity to shift responsibility for the commercialisation work from Council officers to HESCO were taken, it would also require tidying up of delegations to avoid parallel decision-making processes e.g. to address any delegated authorities to officers granted as part of this OBC

3.23.9. While HESCO may take on some (new and novated) contracts at this stage (some of the new contracts are likely to be with the Council), they will be relatively low value contracts e.g. for employment, office space, accounting and legal support, etc. This would be funded from the commercialisation budget.

3.23.10. However, the major contracts associated with delivery of the project (i.e. D&B, O&M, connection and supply contracts) will not be signed until after the Council has approved the FBC. FBC approval would involve all be of these contracts being effectively signed simultaneously (including novation of any contracts from the Council to HESCO). In this case, HESCO will have finalised the negotiation of contracts and be seeking authority to enter into them or be proposing to the Council (in a HESCO authored FBC) a proposal for the Council to novate some of its existing contracts to HESCO. [See section 5.7.50 of the management case]

3.23.11. Enabling HESCO to mobilise for "go live" – the incorporation of HESCO provides the Council with a separate vehicle, with its own company number, registered office and initial board of directors. However, there are many additional administrative steps (i.e. not directly linked to negotiating, agreeing and implementing contractual agreements with HESCO) which are nevertheless required to enable the company to trade on and from the contract commencement date(s). These include:

a) opening bank account(s) and appointing signatories;

b) adopting a suitable system for financial management and reporting, including invoicing (both in and out);

c) registering as an employer with HMRC for PAYE (if the company is going to employ staff);

d) registering for VAT;

e) appointing auditors (if needed in year one) and accountants (note – as HESCO would be a controlled company (which a wholly-owned subsidiary will be), it must obtain the Audit Commission's (or its successor's) consent to the appointment of its auditor);

f) putting in place employment contracts and associated HR policies;

g) ensuring appropriate arrangements are in place for payment of staff and pensions;

h) entering into service contracts/arrangements with executive directors and appointing non-executive directors, if appropriate (note – as a regulated company (which a wholly-owned subsidiary will be), there are restrictions on what can be paid to "regulated directors" in relation to remuneration and expenses);

i) adopting a conflicts of interest policy for HESCO directors;

j) approving/executing director indemnities (from HESCO and/or Council to directors);

k) agreeing a board meeting and shareholder committee meeting schedule;

l) ensuring appropriate health and safety policies are in place;

m) ensuring appropriate insurance is in place (e.g. employers' liability insurance, public liability insurance and directors and officers (D&O) insurance);

n) adopting relevant corporate policies and procedures, including a sensible procurement policy for awarding contracts for the supply of goods, works and services to HESCO;

o) considering whether HESCO requires a specific website and ensure domain name for any company website is registered;

p) registering with Information Commissioner for data protection purposes and ensuring appropriate data protection policies are in place;

q) displaying HESCO's name on the outside of the company's offices or other places of business and show company's name on all business stationery, including letters, invoices, receipts and cheques;

r) showing HESCO's place of registration, registered number and registered office address on all business letters, order forms and electronic business communications, including any website;

s) as a "regulated" company, ensuring all "relevant documents" state that HESCO is controlled by the Council and name the Council.[20].

Failing to complete the necessary steps in advance of "go live" would either delay that date or alternatively expose HESCO to an unnecessary risk. Accordingly, the project plan should allow sufficient time between incorporation of HESCO and commencement of service delivery by HESCO.

3.24. Aggregation / Disaggregation of Contracts to Deliver and Operate Assets

3.24.1. The phasing of the TH and WG projects (and other projects in the wider DEN programme) is the main consideration in the approach to contracting.

3.24.2. There is increased exposure to price risk and risk of challenge if seeking to enter into works contracts where design work has not been progressed to a certain level. On the flipside, there are potential advantages from aggregating projects to achieve scale.

3.24.3. Phasing is also an important issue with respect to deciding whether to seek to combine Design and Build (D&B) with the Operational and Maintenance (O&M) aspects of the DEN programme.

3.24.4. However, consideration of performance risk, which is a key concern for the DEN and this is greatly affected by design and installation quality, is also important when considering whether to combine D&B and O&M.

3.24.5. A combined DBOM procurement can be an effective way to transfer performance risk (especially on more complicated parts of a DEN such as secondary networks and low carbon heat generating plant such as CHP or heat pumps).

3.24.6. However, before committing to a DBOM procurement, it is important to consider:

- there is an extremely limited pool of contractors able to deliver a DBOM contract on a project of this nature (perhaps 2-3, exposing the Council to price risk).

[20] *"Relevant documents"* means (a) all business letters of the company; (b) all its notices and other official publications; (c) all bills of exchange, promissory notes, endorsements, cheques and orders for money or goods purporting to be signed by or on behalf of the company, and (d) all its bills of parcels, invoices, receipts and letters of credit (Companies Act 1985, s349(1), referred to in reg. 4 of the Local Authorities (Companies) Order 1995).

- The complicated parts of the DEN (the ERF and secondary networks) are not being delivered by HESCO and so cannot be covered by DBOM (much of the D&B HESCO will deliver is buried pipes where quality control/latent defects are simpler to address)

3.24.7. There are also other ways to address performance risk. A similar transfer of risk to that achieved through DBOM can be obtained through employing a long-term O&M provider to monitor the design and installation process (delivered by others) prior to adopting plant which they are required to operate in accordance with minimum performance requirements.

3.24.8. Bearing this in mind and considering there is a pressing need for the Council to procure O&M services for a number of DEN projects nearing completion within the HRA, it is therefore proposed to split O&M from D&B.

3.24.9. The above consideration of DBOM excludes the CSB role. This is clearly a distinct role from the works but also from the O&M services (which are technical in nature whereas the CSB is the primary customer interface). This is demonstrated by the limited number of organisations that provide both O&M and CSB services. It is proposed to split CSB into a separate service to maximise competition.

3.24.10. The D&B, O&M and CSB services are therefore discussed individually below.

3.25. Design and Build (D&B)

3.25.1. As discussed in paragraph 3.24.2, the alignment of the development and delivery programmes for each DEN project affects the extent to which the procurement of the D&B of the projects can be aggregated. As discussed in paragraph 3.24.2, the alignment of the development and delivery programmes for each DEN project affects the extent to which the procurement of the D&B of the projects can be aggregated. If the TH and WG projects do both proceed, they are likely to have similar delivery programmes and so the team will assess opportunities to deliver better value by aggregating these schemes. Alongside this, the other Council scheme at North Tottenham will be monitored for opportunities to combine procurements.

3.25.2. While the works will be procured under a standard D&B process, DEN projects in the UK are specialist by nature and it is crucial that the quality of the install is high. Therefore, we will be targeting contractors with proven track records of delivering similar works, with sufficiently robust warranties as latent defects can have a significant impact on overall performance and can be difficult to identify and put right. These warranties will be transferrable to allow assignment from the Council to HESCO (as the Council may instruct some works prior to the set-up of HESCO) and to potential future owners. As discussed in 3.24.7, the O&M provider (described in next section) will be contracted to oversee the design and installation process and manage performance risk.

3.25.3. There are a range of contract options which are used in the market to cover D&B activities for DENs. Contracts can be either bespoke to heat networks or be more generalised contracts adapted for use with heat networks. Standard build contracts, such as JCT, NEC4 or FIDIC are commonly used, and well understood by both the market and the Council. The council would normally use JCT and are likely to for these works, though it is recognised that other contract forms are acceptable as long as there are suitably experienced staff available to undertake the contract management role.

3.25.4. HESCO's activities are likely to be subject to the Utilities Contracts Regulations 2016 (UCR), rather than the more general Public Contracts Regulations 2015 (PCR). All utilities (which includes contracting authorities undertaking certain heat and electricity supply activities) in England are subject to the Utilities Contract Regulations 2016 ("UCR"). Contracting authorities which are also utilities will be subject to the UCR (rather than the PCR) when procuring contracts for their "relevant activities" (e.g. supplying electricity to a network or the supply of heat). Refer to the procurement papers (Appendix J)

3.25.5. These works will therefore be procured under the Utilities Contracts Regulations (2016), using the negotiated procedure. This type of procurement activity is likely to take 7-9 months to complete, excluding approvals. The scope of the D&B procurement includes:

- Installation of the main interconnector to Enfield (TH and WG);
- Energy Centre Shell (TH only);

- Energy Centre fitout. (TH and WG);
- Installation of primary network in TH and WG;
- Installation of substations

3.25.6. The D&B procurement is likely to be subdivided into individual packages to seek best value. There is a limited pool of contractors (perhaps 3-4) who can provide the full range of D&B services required for the DEN programme and slightly fewer who could provide a DBOM service.

3.25.7. Breaking the contract up into smaller, more specialist packages will significantly increase competition and provide better pricing.

3.25.8. Although this will increase HESCO's need to manage interfaces between contracts, there is inevitably a need for this type of coordination on a project of this scale which will be built in a number of phases over many years (e.g. see 3.25.10 but also consider that the secondary networks within buildings are some of the most complicated parts of the scheme and these will be designed and built by individual developers21). Therefore, HESCO will need to be capable of managing contract interfaces.

3.25.9. In addition, subdividing the works will give the Council the most amount of flexibility ensuring the wider development programme is taken into account.

[redacted]

3.25.11. One area where the phasing issues set out in 3.24.2 are less of an issue is the primary network. Here is impractical to design the pipework to the same level of detail as above ground assets prior to procuring anyway. Thus there is greater scope to procure a single provider across all of the Council's DEN projects to benefit from economies of scale.

3.25.12. The potential to use suitable frameworks for the delivery of the DEN project will be monitored prior to launching procurements (start of procurement for the main D&B contracts is some months away due to the amount of design work required). This is considered more likely for the energy centre building and energy centre fit-out (where e.g. the Council's own LCP framework, Re:FIT or others will be carefully considered) than for buried pipework (where no potential frameworks have been identified suitable for these highly specialist works).

3.25.13. One area the team is investigating is how the Stoke City DEPO22 framework (which is a public sector procurement vehicle for District Heating pipe materials) can be used for the delivery of pipe materials only (i.e. supply of the pipe and not their design and installation) across the D&B elements described above promoting standardisation & optimised pricing.

3.25.14. The precise approach to risk transfer in D&B contracts will be determined closer to the time but typically it is expected the procurements will target transferring design risk (obviously) as well as

[21] A variety of methods are being used to standardise the design of secondary networks e.g. recent planning approvals require developers to comply with a standard specification

[22] Decentralised Energy Purchasing Organisation

risks around programme and price (through seeking fixed price contracts and appropriate LADs for delay).

3.25.15. Procurement of the buried pipe will provide opportunities to negotiate around risk allocation for e.g. incidences of contaminated land along the route, the need to divert utilities, etc.

3.26. Operation and Maintenance (O&M)

3.26.1. While there are difficulties in aggregating works contracts from all of the Council's DEN projects into a single procurement as set out in 3.24.2, it is far simpler to aggregate the services elements of the project,

3.26.2. In particular, there are significant benefits to having a single O&M provider operating across all DEN networks. These include procurement efficiency, consistency of approach across all schemes, reduced administration burden on HESCO (through a single point of contact), economies of scale to reduce pricing, and increased focus from contractor based on the increased value of the contract.

3.26.3. The works to the Broadwater Farm Estate were procured under emergency measures to ensure individual gas boilers could be removed from the blocks on health and safety grounds. The district heating scheme, which is run as an in-house scheme within the HRA, currently serves 937 existing homes across 11 blocks and two schools. One of the high-rise blocks is to be demolished which will reduce the load to 835 homes and two schools but redevelopment of the estate will see around another 350 new homes added to the system. The emergency works are now nearing completion (having been delayed by Covid) and, while there are interim arrangements in place for the ongoing O&M, the pressing need to procure an O&M provider means procurement has started.

3.26.4. There is a similar need to procure an O&M provider for new Council housing blocks being acquired in Tottenham Hale at 1A Ashley Gardens and Welbourne as these will complete within the next 12-months.

3.26.5. This immediate imperative to source an O&M provider for Council housing ahead of developing the FBCs for TH and WG is one of the reasons a DBOM (Design, Build, Operation and Maintenance) approach has not been taken.

3.26.6. However, the O&M tender has been structured to:

- take the opportunity to procure a single O&M provider across the programme who can carry out technical operational services for all Council DENs (the procurement explains that the O&M service may be split into multiple contracts and some of these may be novated to a Council SPV).
- transfer operating risk by ensuring robust minimum performance standards are in place
- allow us to reach a similar position as if a DBOM procurement had been undertaken (see paragraphs 3.24.6 and 3.24.7) as the O&M provider will be in place and in a position to review designs, oversee construction and adopt new plant

3.26.7. The strategy for the O&M procurement is to use a negotiated route under UCR2016. This route allows for negotiation which is necessary to address the complexity of the scope without creating divergent solutions. This type of procurement is likely to take 7-9 months to complete, excluding approvals (which in turn are lengthened by the requirement for consultation with leaseholders at Broadwater Farm).

3.26.8. Haringey has purchased an existing contract from B&D Energy Ltd (Barking and Dagenham Council's wholly owned ESCo), which it has adapted to meet the specific needs of the DENs.

[redacted]

3.26.10. The O&M tender is seeking a provider to deliver design and installation review, operation, maintenance and repair services for a period of 5+5 years for existing HRA schemes/ HRA schemes under construction at Broadwater Farm, Welbourne and Building 1A, Tottenham Hale and is then expandable to all new schemes. The estimated value of the contract over 10yrs is up to £10m.

3.26.11. The scope of services includes all aspects of a DEN from energy centres through buried networks, above ground networks and systems within dwellings up to including the HIU and meter but not the tertiary in dwelling heating systems (which require minimal maintenance). The operation and maintenance requirements will be undertaken in accordance with O&M manuals and manufacturers' recommendations with a backstop of SFG20 (the industry standard specification for maintenance of building engineering systems).

3.26.12. In addition, the procurement will obtain a schedule of rates to provide these services to new DEN schemes built to the Council's standard specification as well as a design review and option process.

[redacted]

3.26.14. The services cover technical services that could be required by either the HRA or HESCO and transfer risk to the provider via:

- An output specification defining minimum system performance with payments from the contractor where these are not achieved, set to reflect the loss incurred, coupled with gain share mechanisms where the performance exceeds the minimum requirement to ensure the system is run efficiently.
- SLAs relating to a wide range of issues including e.g. response times, fault rectification, delivery of disaster recovery, call response, etc. with compensatory payments to mirror those offered to residents by HESCO for interruptions to supply, missed appointments, etc.
- Via a contractor's financial liability, to require the provider to meet the cost of repairs up to an agreed limit. A range of limits are included in the tender document and it will be our intention to contract on a fully inclusive basis if possible (subject to tender prices in comparison to budget).

3.26.15. This approach has been taken for several reasons:

- The contract value and nature of the services dictated that the route to market needed to comply with the Utilities Contract Regulations 2016.
- A market review identified that no suitable frameworks existed.
- The nature of the procurement requires negotiation, the UCR negotiated procedure was selected.
- The use of the Barking and Dagenham contract was chosen as it was a developed form of contract for provision of essentially the same services which had already been tested with the market and was available to allow the procurement to be launched ASAP.
- A single provider will improve efficiency of procurement, simplify management, and drive economies of scale.
- The design review process, minimum performance standards and a contract length of up to 10 years allows a long-term transfer of performance risk and provides stability during a period where the DEN programme is expected to be growing.
- The combination of the contractor taking liability for repairs and future minimum standards for performance means that they will be motivated to ensure the design review and adoption process is rigorously undertaken (therefore reducing the requirement for technical resource to review this either within the DEN team or from external engineering consultants)
- The 5yr breakpoint provides an opportunity to switch providers. It will also allow the Council to consider insourcing the contract if the scale has increased sufficiently to allow this.

3.26.16. Note that the procurement allows for the service to be broken up into multiple contracts covering different scopes of the Council's heat network portfolio. This is to take account of the likelihood that the Council will get into contract with a provider prior to set-up of HESCO but will then want to novate some aspects of the contract to the SPV.

3.27. Customer Service and Billing (CSB)

3.27.1. The Customer Service and Billing function is the customer interface part of the heat sales role. It is therefore a critical function in terms of ensuring positive customer interactions and keeping the reputation of the heat supplier (whether that be HESCO for TH and WG or the Council supplying

HRA properties) intact. Careful thought is therefore required before outsourcing this function to the private sector.

3.27.2. Sections 3.3 and 3.4 identified that Homes for Haringey (HfH) already performs a similar function in terms of liaising with residents on general housing matters, repairs, collecting rent and service charges and specifically collects heat income (on unmetered schemes – although there is no experience within HfH of billing metered schemes) and are well placed to provide this function to either:

- Newer HRA schemes which are now metered (and where the service must start imminently); or
- The non-HRA schemes within HESCO's portfolio (where the service is not expected to be required until 2024)

3.27.3. Noting that this would require two separate arrangements between HfH and the Council/HESCO.

3.27.4. While involving the existing expertise within the wider Council family is seen as desirable in terms of protecting the Council's reputation vs. outsourcing this service and bearing in mind the Council's policies on in-sourcing, HfH has indicated that they are not in a position to mobilise a new CSB service for metered schemes in the short-term.

3.27.5. Furthermore, the Council is currently reviewing whether there are benefits from insourcing HfH to improve accountability and better join up services.

3.27.6. Therefore, while the medium-term plan is to deliver the CSB service (to both the HRA and HESCO heat supply operations) from the same Council-owned pool of expertise, the precise route for delivering this will be kept under review.

3.27.7. In the short-term, officers have developed a scope of services for the CSB role to procure an external service provider for the newer HRA schemes where meters have been installed (i.e. Broadwater Farm, Building 1A and Welbourne).

3.27.8. This scope of services is designed to dovetail with the O&M procurement where e.g. the O&M provider is responsible for demonstrating that metering systems are operational, signing off that an appropriate schedule of meters has been produced and providing meter readings to the CSB provider.

3.27.9. The scope also sets out service level expectations in detail around response times to resolve customer queries, customer satisfaction, financial reporting (of e.g. aged debt), etc. with payment tied to achieving minimum requirements. Hence the contract is designed to ensure service levels are high. The contract will also transfer price risk for maintaining these service levels.

[redacted]

3.27.11. The procurement is expected to start in November and will be under the Utilities Contract Regulations where the services threshold is £378,660. As the contract value is over £160k, a waiver will be required under the Council's Contract Standing Orders as the contract value is over £160k (this is a technicality as the thresholds in the standing orders have been drafted with the Public Contract Regulations in mind -the CSOs require an OJEU process is followed even though this is not necessary for procurements of this scale under the UCR).

[redacted]

[redacted]

3.27.16. A price will need to be negotiated against the scope of services and benchmarking will need to be undertaken alongside this exercise to confirm the proposal delivers value for money.

3.27.17. This exercise should be concluded in good time to feed into the FBC and to allow the Council/HESCO to procure a longer-term solution (i.e. before the short-term private sector contract for the HRA expires and before HESCO starts operation, both in 2024/25) should the 'in-house' arrangement not stack up.

3.27.18. Given these timescales, the process to start working up the in-house solution does not need to start in earnest for at least 12-months. It is therefore recommended that the high-level strategy for the medium-term provision of this service set out here is kept under review.

3.28. **Contract Management**

3.28.1. The resources required for the procurement stage up to FBC are covered under the management case. The requirement for ongoing contract management resource to deliver the project after FBC will be further developed in the lead up to FBC.

3.28.2. Considering the size and scale of the delivery contracts, it is imperative that a suitably experienced professional contract management team be brought onboard to manage the project(s). This could include contract managers, owners' engineers, quantity surveyors etc.

Section 4: Financial Case

4.1. Introduction to the Financial Case

4.1.1. The purpose of the Financial Case is to give an indication of the financial viability of the project.

4.1.2. It takes the preferred technological option identified in the Economic Case Techno-Economic Model (TEM) and the costs (capital and operational) and revenues from that model, which are real, pre-tax and pre-finance costs and shows the impact of applying a commercial structure that includes tax, indexation/inflation and financing to develop a financial Base Case. Additional sensitivity analysis is also undertaken in order to assess the robustness of the Base Case.

4.1.3. For both the Tottenham Hale and Wood Green networks, expectation of future expansion is built into the model assumptions. Each network is built over a c. 10 year timeline, installing the integral components of the network and connecting new customers over a phased timeline, achieving full modelled capacity by 2034 for the Tottenham Hale network and by 2036 for the Wood Green network. There is by necessity a level of estimate in these assumptions, but those assumptions made are considered to reflect a reasonable, prudent set of assumptions regarding customer connection to the network.

4.1.4. Beyond the assumed customer demand included in the Financial Case, the schemes are both expected to continue to grow and provide returns greater than that included within the Financial Case, but that upside has not been factored into the Financial Case and so the Financial Case reflects a prudent scenario.

4.1.5. Similarly, although on occasion the Economic Case considered the monetisation of environmental benefits, the Financial Case considers the availability of grant funding that may be on offer to the project because of its environmental credentials.

4.2. Financial Resources & Budgets

4.2.1. Project cash flows have been considered over a period of 40-years from the commencement of the connection of customers to the network. The Financial Model has the capability to assess the project over a shorter or longer timeframe if required (a 25-year operational period has been assessed as part of the sensitivity testing). The timing of the construction and commencement of operations does not alter within the Financial Model, regardless of project length.

4.2.2. The Financial Model considers the costs and revenues of the build and operation of the network, including the project management costs. It does not capture the ‘commercialisation’ costs required in undertaking the process to procure the various parties required to bring the Project to Financial Close. These are costs that traditionally sit outside of a Financial Case, as these costs relate to bringing the Project to fruition rather than the costs of the Project itself. The level of such costs is influenced by the procurement approach undertaken, the level of input required from professional advisors and the extent of negotiations required with the market. The Management Case section of this Outline Business Case provides detail of the approach to be taken to the procurement of the expertise and contractors required to bring the Project to a successful completion.

4.2.3. The Financial Model assumes that, at the end of the operational period, the assets of HESCO can be sold onwards at their net book value at that time. The Base Case is rolled out over a phased timeline as detailed in the Management Case.

4.2.4. The table below describes the timeframe applicable to the construction and commencement of operations for the Project. It should be noted that this is the timeline developed in the Techno Economic Model (TEM) which is the basis for the Economic Case.

Table 4.2.5 – Project Timelines for Wood Green & Tottenham Hale

Task	Tottenham Hale	Wood Green
Construction Start	2021	2023
Construction Completion[23]	2034	2036
Operations Start	2022	2024
Operations Cesses	2061	2063

4.2.5. The Financial Model was developed to project the Cash Flows (including Income Statement and Balance Sheet) for the heat network. The model also produces:

- Nominal Project IRR (based on Project cashflows excluding financing and taxation)

- - Project NPV (based on the Project cashflows)

- Nominal Council IRR (reflecting the cashflows returned to the Council)

- Council NPV (based on the Council's cashflows

4.2.6. These are calculated to help understand the economic robustness of the DEN. The modelling process also gives an indication of the financial returns of the DEN and therefore the types of funding that might be available. The Section "Calculation of IRR and NPV" includes an explanation regarding the calculation of these values.

4.2.7. The Financial Model assesses the investment needed and the potential returns, having incorporated the tax and debt financing costs assumed. The development of the TEM into a Financial Model has assisted the identification of the optimum network combination for project delivery and subsequent stress testing of the key variables.

4.2.8. Appendix K provides the detailed breakdown of assumptions made in the development of the Financial Model for Wood Green. Appendix L provides similar details for Tottenham Hale.

4.2.9. In developing the Financial Case, the Financial Model considers the costs and revenues of the build and operation of the network, including the project management costs for the construction of the network once the preferred bidder has been selected.

4.2.10. The Base Case as presented in this Financial Case is considered to reflect a prudent base case and forms the basis of the Council's core assumptions. The financial performance of both DEN projects is greatly affected by the number of customers and the speed of growth of the networks, which has a consequent impact on the capital and operational spend, as well as the level of revenues. A 'shock test' has been developed, the results of which are included in Appendix M for Wood Green and Appendix N for Tottenham Hale to assess the impact of the risk of a reduced level of growth. This shock test reflects, rather than a simple sensitivity test, a full additional set of outputs from a revised Techno-Economic Model.

4.2.11. Through the development of the Economic Case, two scenarios have been developed for the growth of the network, working closely with the Council's housebuilding, regeneration and planning teams to assess likelihood of those developments proposed to connect to the DEN either being delayed or failing to come forward, alongside the potential for additional schemes to come forward which could replace them. This has been used to forecast the Base Case and a "shock test" which considers the impact of delays to the build out of the heat network to the affordability of the projects. Appendix M and Appendix N provide the details of the key differences between the Base Case as presented in this Financial Case and the shock test.

[23] It should be noted that the Economic Case considers various growth scenarios, which would result in further construction outside this timeframe. The scenario reflected within the Financial Case is considered to be a prudent Base Case.

4.3. Funding Structure

4.3.1. In principle, there are several sources of funding which may be available to the Project. These include:

- Equity (either public or private sector)
- Debt (either public or private sector)
- Grant e.g. HNIP
- Other capital asset financing options e.g. Community Infrastructure Levy (CIL), Energy Company Obligation (ECO, see 5.7.22)

4.3.2. Appendix O provides a high-level appraisal of the various funding options available for Wood Green and Tottenham Hale. Based on the assessment undertaken, the analysis assumes that both projects would be funded primarily through a Public Works Load Board (PWLB) loan.

4.3.3. The impact of HNIP grants and loans to support the development of the network has also been assessed in line with the funding offers made to the projects following successful bids as per table 4.3-3 below:

Type of funding	Tottenham Hale	Wood Green
Commercialisation Grant	£1.2m	£0.85m
Construction Grant	£3.4m	£7.18m
Construction Loan	£12.65m	£2.56m

Table 4.3-3: Impact of HNIP loans and grants

4.3.4. Note that the combined impact of the construction grants and loans combine to create an overall equivalent grant which is in line with the assumed level of HNIP funding in the Economic Case for both projects.

4.3.5. Other potential sources of funding available include: Green Investment Group, European Investment Bank, European Local Energy Assistance (ELENA), Private Sector. These sources have not been explored further, but are discussed in Appendix O.

4.3.6. It should be noted that, while commercialisation grant funding offers have been received from HNIP, the impact of these are not included in this Financial Case, as commercialisation costs (and associated funding) fall out of scope of the Financial Case.

Equity

4.3.7. The Base Case assumes that HESCO is established, in the form of a company limited by shares, into which the Council can make a pinpoint equity investment (i.e. an amount not designed to fund the activities of HESCO). The amount of such pinpoint equity reflects that it is not the primary capital funding source and is at sufficient levels to incorporate the company.

Debt

4.3.8. A significant proportion of the capital requirements of HESCO are structured to be met through debt. This includes a drawdown of debt from the Council as well as a loan from the Heat Network Investment Project (HNIP), through the Department for Business, Energy and Industrial Strategy (BEIS). Where positive operating cash flows of HESCO are not sufficient to meet the capital demands, further debt drawdowns from the Council will be required.

[redacted]

[redacted]

4.3.10. Benefits of the pinpoint equity investment are realised in later years of the project through dividends paid to shareholders.

[redacted]

[redacted]

4.3.12. Note the grant funding and below market rate debt that each project is able to accept is subject to Subsidy Control considerations, which is detailed in Section 4.15.24

Grant

4.3.13. Grant Funding is the most cost effective and attractive source of funding as it does not incur any interest charges and the capital does not need to be repaid. This funding may be obtained through a UK or regional initiative. Note that connection charges have the same impact as a grant as they are also non-repayable and do not attract interest charges.

4.3.14. HNIP has also made a construction grant available to each project which is detailed in Table 4.3.3.

[redacted]

4.3.15. Note the grant funding each project is able to accept is subject to State Aid Subsidy Control considerations, which is detailed in Section 4.14.[25]

Community Infrastructure Levy

4.3.16. The Community Infrastructure Levy (CIL) is a planning charge, introduced through the Planning Act 2008, to allow local authorities in England to assist in the delivery of infrastructure to support development. Under the Base Case for Wood Green, £650,000 of CIL and for Tottenham Hale, £1.5m of CIL has been included and formally allocated by the Council's Cabinet as part of its Capital Programme. This will contribute to funding the construction of the project. As with grant funding, the amount available is subject to Subsidy Control considerations. Please refer to Section 4.15for further details of this.

Alternative capital asset financing options

4.3.17. The Financial Model assumes that fixed asset capital demands (where not already met by grant or CIL) are met through the injection of debt in to HESCO. However, there are other options that may be considered 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 in Appendix O for Wood Green & Tottenham Hale.

4.4. Consideration of Base Case

4.4.1. To determine the funding approach various factors have been considered. A summary of these key influences is detailed below.

Thin capitalisation

4.4.2. While there is no reason that the DEN cannot be financed principally by a shareholder loan, it is very likely that, for taxation purposes, HMRC would not allow 100% of the interest on the loan to be considered deductible for corporation tax purposes. As such, under the Base Case, we have assumed that 25% of interest paid is 'added back' to the corporation tax calculation, in order to reflect this position.

Grant funding

4.4.3. The indicative returns of the heat network are strengthened greatly through the inclusion of grant funding to support the construction of the network. HNIP has made formal offers of construction grant to each project, which are detailed in section 4.3.3.

4.4.4. Third Party Investment is considered that, based on the indicative returns of the Project, there is likely to be little third-party appetite for the Project at the current time. In addition, given the timelines to which the Project is working and the constraints this places on the Programme, there is not considered to be sufficient time available to identify a third-party partner that may be willing to work with the Council on a basis that would be acceptable for all parties. It is noted that the level of third-party interest may change once the construction has been completed and the DEN is operational and generating demonstrable returns. Once this has been reached, the Council may wish to consider refinancing, in order to free up Council resources for use for other purposes.

4.4.5. It should be noted that the Council is engaging with neighbouring Boroughs to establish their appetite for collaboration in the development of the heat network programme. This engagement will continue to be focused on investment and installation of the proposed interconnector pipe used to transport heat from the ERF to local schemes.

4.4.6. While, as noted above, introducing third party funding at the start of the Project(s) is extremely unlikely due to the short amount of time available before construction commencement and the limited degree of control the Council currently exerts over the customer base, it is possible to split out the construction of the interconnectors from the construction of the local networks in Tottenham Hale and Wood Green. As the ERF is not scheduled to be operational until 2025, this provides a

[redacted]

sufficient timeframe to seek potential investment partners and, as HESCO will be effectively a 'single customer' at the end of the interconnector, control is also increased. As such, the introduction of third-party funding into later stages of the project could be possible through the establishment of a separate 'PipeCo' that would own the interconnectors and distribute energy between the point of connection with Energetik and the local energy centres in the neighbourhood schemes. This is explained further in Sections 3.4 and 3.5.

Potential exit strategy

4.4.7. This Outline Business Case has been developed throughout on the assumption that the Council is seeking to deliver low carbon heat to customers across the Borough for the long term. Detailed work has therefore not been undertaken in considering exit strategies for the Council.

4.4.8. It is considered that, due to the level of returns of the network and the complexity of the build programme, that there would not be an appetite from private sector developers for the construction of the network. Furthermore, the timelines involved in constructing the network, and the level of control the Council would wish to be able to exert in the short-term, also mean that there would be a lack of interest from the private sector.

4.4.9. However, following the successful construction of the network, the risk profile of the heat networks change significantly. At this point, the steady state operations of the network would represent a 'known quantity', and could provide a consistent annual return for a long-term investor seeking regular predictable cashflows – a pension scheme would be an example of such an investor.

[redacted]

4.4.11. The value achieved for each network would be dependent on a valuation at the time of sale, taking account of market appetite at that time.

Equity / Debt split

4.4.12. The Council have explored the level of debt vs. equity the Council will to put into the project, presenting a sensitivity assessing the impact of 25% of the Council initial funding of the network being made through equity investment. This approach alters the gearing of the network, making it more straightforward in future, for example during the operational phase of the network, to replace the Council's investment in the network with an alternative third-party provider. However, this approach was not selected for the Base Case as the NPV returns of HESCO to the Council are reduced through structuring HESCO in this manner.

4.5. Council Capital Investment Required

4.5.1. The funding requirements (including the impact of indexation) are shown in the tables below:

- **Equity:** Reflects the amount paid by the Council to HESCO for the shareholding in HESCO.
- **Loan drawdown:** The Council loan requirements of HESCO, after utilising other available sources to fund the capital costs of the network in any particular year
- **Interest and capital received:** This is the amount paid by HESCO to the Council to service interest payments, as well as repayment of capital on a revolving basis
- **Cumulative investment:** This cumulative figure demonstrates the total balance invested in HESCO at the end of each financial year.

4.6. Overall Financial Benefit to Council

[redacted]

[redacted]

[redacted]

4.6.4. The NPV values above present the value of the discounted cash flows of various elements of the Projects over the Project life. Section 4.9 explains the approach to the discount rate applied. The cash flows are comprised of the following four elements:

- PWLB borrowing. This represents an upfront cash inflow to the Council, followed by an annual repayment profile as repayments are made on an annuity basis. As the interest rate charged is less than the discount rate applied, this results in a net present value for the Council
- HESCO loan. This represents initial cash outflows for the Council, followed by repayments as HESCO has sufficient resources to make repayments. As the interest rate charged is less than the discount rate applied, this results in a net present cost to the Council
- Dividends received. These reflect the dividends received from HESCO. As debts are repaid before dividend payments are made, these are made towards the end of the modelled term, therefore have a significant discount rate applied
- Business rates retained. These reflect an annual cashflow to the Council, discounted over the life of the Project.

4.7. Consideration of funding sources for the Council

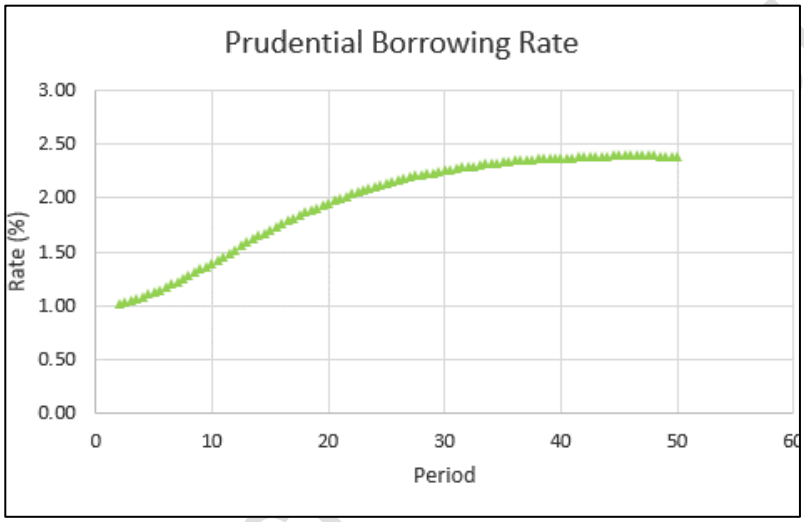
4.7.1. When considering whether to invest in the DEN, the Council should compare its potential Council IRR to the rate at which it can access capital, as well as comparing it against any alternative investment options available. In the case of the cost of capital it is likely that the funds would come from the PWLB, the Council does not have reserves which could fund this. A reason to invest could be if the returns were higher than the costs of borrowing from PWLB, and the Council was clear that investment achieved service delivery objectives so that investment would not be justified by purely financial or commercial reasons.

4.7.2. In addition, the Council could consider other financial benefits that may be available, such as retention of business rates from HESCO or from the occupation of premises throughout the proposed Tottenham Hale heat network area. It also excludes the key wider benefits from the Project, e.g. the reduction in carbon emissions resulting from a move to a heat network solution.

4.7.3. Appendices K and L discuss the calculation of business rates. It should be noted that the value of business rates payable by HESCO, and indeed the proportion retained by the Council is an area subject to significant change and could vary over time. See also the sensitivity testing provided in relation to business rates retention rates within Appendices M and N.

4.7.4. As at May 2021, the current prudential borrowing rates are as per the graph below (based on access to a new PWLB Annuity), and range from 1.02% - 2.39%, depending on the period of borrowing. The Council 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 40-year annuity are in the region of 2.38%.

Figure 4.7-4 - Prudential borrowing rates as at May 2021



4.7.5. The Council has confirmed that the Heat Network project must 'wash its face', providing a return in excess of the Council's own cost of borrowing with reference to the PWLB interest rate for borrowing. [redacted]

4.8. Financial Metrics

4.8.1. This section describes the various financial metrics of the Base Case and sensitivities tested. Values reported, unless stated otherwise, have been calculated over a 40-year period. The metrics are:

- **Nominal Project IRR (pre-tax)** – This is the nominal returns of the project before the impact of Corporation Tax and the financing solution. It should be considered along with the Council IRR below to give a rounded view of the project.
- **Project NPV** - This is the net present value of the project before the impact of Corporation Tax and the financing solution
- **Nominal Council IRR** – This allows the Council to estimate the potential profitability of their investment. IRR is a discount rate that makes the net present value of the cash flows received by the Council (i.e. margin on loan to HESCO, dividends received and retained business rates) equal to zero. Generally speaking, the higher an IRR, the more desirable an investment is to undertake. In general, when comparing investment options with other similar characteristics, the investment with the highest IRR would probably be considered the best.
- **Council NPV** – This is the net present value of the project to the Council based on the funding solution adopted – i.e. including the impact of the Council's PWLB borrowing to fund the project

4.9. Calculation of IRR and NPV

4.9.1. The NPV calculation uses, as its basis, the HMRC Green Book guidance28. This uses a public sector discount rate adjusting for social time preference. This is defined as "the value society attaches to present, as opposed to future, consumption". The Green Book discount rate, also known as the Social Time Preference Rate (STPR), is set at 3.5% in real terms for the first 30 years of a Project and 3.0% thereafter (for the time period covering the duration of this project).

4.9.2. The use of this discount rate for a public sector appraisal differs from private sector discounting. "The use of STPR in public sector appraisal differs from private sector discounting. Decisions about the overall size of public spending and allocation of budgets are taken on a top-down basis… This approach to the STPR contrasts with private sector discounting which incorporates allowances for the cost of raising capital and compensation for risk".

4.9.3. It should be noted that the 3.5%/3.0% discount rate applies to real values, with the effects of general inflation already removed. As noted in the section on indexation the majority of cashflows in the heat network have an RPIx assumption applied – this value is multiplied by the discount rate in order to calculate the NPV of the cashflows and so gives a discount rate closer to 5.5% to 6.0%.

4.9.4. The Project and Council IRRs are calculated based on the nominal cashflows of the project. For the Project IRR, these are the cashflows of the project before the impact of financing and tax (including CIL and/or HNIP grant funding assumed for the project). For the Council IRR, the cashflows take into account not only the post-tax and financing cashflows of the project, as well as cashflows from Business Rates paid by the SPV but retained by the Council.

[28] *https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/685903/The_Green_Book.pdf*

4.10. Base Case Results – Tottenham Hale

4.10.1. The table below shows the results of the Base Case for Tottenham Hale.

[redacted]

4.10.2. This table shows positive returns for the Base Case. The Council, investing into the Project is remunerated on its investment in two ways; through the payment of interest on debt lent to HESCO and through the receipt of dividends as a shareholder. In addition, the Council gains the benefit of retention of 30% of the business rates paid by HESCO currently. By necessity, as a result of the cash demands of HESCO, dividends are not available until the later years of the Project, after capital funding requirements and debt obligations have been met. The figure below demonstrates the returns profile of the HESCO.

[redacted]

4.10.3. From this, it can be seen that the business is able to have repaid all its debts by the end of the 40-year operational period, Following the repayment of debt, HESCO is in a position to pay dividends to the Council as shareholder. Note that the reduced income in years 2047 and 2049 is due to high costs to replace large items of plant in those years.

4.10.4. The analysis above has been prepared on the basis of a base case considered by the Council to reflect a reasonable level of scheme expansion and connection to the network. This by its very nature includes a level of estimation and consideration of the likelihood of various developments throughout the Borough coming online and connecting to the network. Those included are considered to reflect a realistic connection proposition. Further potential connectivity and expansion to the network has been identified which has not been included within the initial financial modelling. Given the nature of the network, with significant capital expenditure incurred in laying the spine pipe of the network, while further connections are likely to incur additional capital cost, these should reflect a greater profitability to the network as the significant initial capital expenditure will already have been incurred.

Net Cash position of HESCO – Tottenham Hale

4.10.5. An important consideration for potential investors is the net cash requirements placed on the investor in order to invest in the business. The figure below reflects the net cash position, from the

perspective of the Council into the network; this includes all cash demands placed on the Council and all the receipts from HESCO. It is shown on a cumulative basis.

[redacted]

4.10.6. [redacted] While there are some demands from the business after this time, based on the profiled cash flows, the Council would not need to raise additional funds, as they can be met by the returns already received from the network (assuming they are ring fenced).

PWLB Repayment Risk – Tottenham Hale

4.10.7. As detailed earlier in the Financial Case, the assumption is that the Council funding for HESCO is through borrowing from the Public Works Loan Board. This brings with it the risk of a misalignment between the amounts borrowed from the PWLB and the amount lent to HESCO. We have therefore calculated the difference between these two repayment profiles to understand the Council's exposure at a point in time. This is presented in the table below:

4.10.8. The calculations below are made on the following assumptions:

- The Council makes an initial one-off drawdown from the PWLB at the commencement of the construction of the Project;
- The length of PWLB borrowing is assumed to be 40 years.

4.10.9. From Table 4.10-18 it can be seen that, based on the timing of income and expenditure in the financial model, the Council is never in an 'exposed position' (i.e. owing money to the PWLB that it will not already have to hand/will not receive from the HESCO in-year).

4.10.10. Factoring in the retention of 30% of business rates, and the Project assuming a revolving loan basis, HESCO is projecting to return more cash to the Council than the Council is obligated to pay under the PWLB assumptions made. [redacted] As noted below, the PWLB borrowing has been assumed on a simplified upfront basis for the purposes of modelling in this Financial Case. Through commercialisation and the development of the Full Business Case, the Council will continue to assess and determine the most appropriate borrowing strategy [redacted].

4.10.11. It is important to note the following two potential benefits that are not included in the table below:

- The surplus represents available funds that the Council could use in other activities, and which would contribute to its overall cashflow position, recognising that this will be fairly small in the scheme of the Council's annual cashflow. The potential benefit of this has not been accounted for.
- The simplifying, and prudent assumption has been made that the PWLB borrowing is made of a single amount at the commencement of the project. As an alternative, the Council could profile borrowing to align with project borrowing requirements, to reduce the level of interest payments.

4.10.12. It is recognised that the approach to the borrowing from PWLB does not reflect the most efficient drawdown profile, if interest charge minimisation is a focus of the Council. The assumption has been made for financial modelling purposes to serve as a 'proof of concept' and demonstrate that even with this approach, the Programme can service its debt and provide overall financial benefit to the Council. It is expected that, as the Programme moves into commercialisation, a more detailed financial model would be developed, particularly focusing on the construction phase of the Programme, for which a monthly model would be prepared. This would provide greater insight for the Council on capital funding requirements and allow the Council to consider levels of PWLB drawdown required at a specific point in time, profiling this as appropriate to reduce interest exposure.

4.10.13. In addition to the Base Case financial model, numerous sensitivities have also been modelled, in particular regarding business rates retention and a 'shock test' representing a slower and lower build out of the network. Details of these and associated commentary are included in Appendices M and N.

4.10.14. The Autumn 2021 budget announcement included the following measure in respect of business rates for heat networks:

"This measure will exempt eligible plant and machinery used in onsite renewable energy generation and storage from business rates, as well as providing a 100% relief for eligible heat networks that have their own business rates bill. This measure will take effect from 1 April 2023 and run until 31 March 2035.[1]"

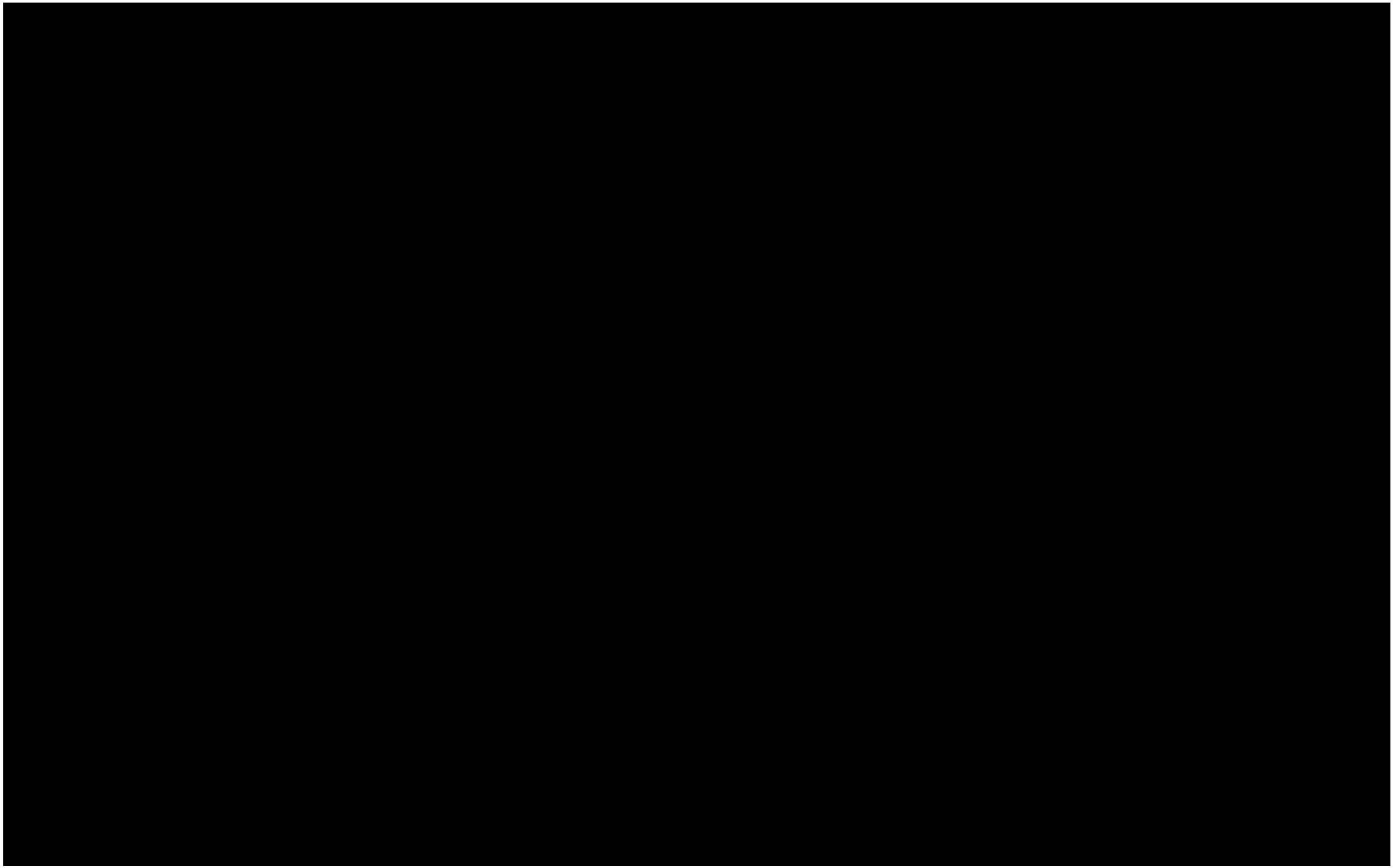
4.10.15. This announcement has the potential to present a significant upside to both the Project and the Council, as business rates represent a significant cost to both heat networks Given the timing of the announcement and the current uncertainty of the eligibility of individual schemes for business rate relief (although, based on the information announced to date, it would be surprising if the DEN was not eligible), the Base Case does not include an assumption of exemption from a business rate charge.

4.10.16. As an indication of the potential benefit these changes could have, included within the sensitivity analysis at Appendix M for Wood Green and Appendix N for Tottenham Hale. The change results in an overall improved cashflow for the Council and a faster repayment of debts.

4.10.17. The Council must also consider the possibility that BEIS could seek to 'reclaim' this benefit through seeking to reduce the level of grant or loan offered to the projects as part of their 'end of commercialisation' review). This would also impact on the overall upside on the change in business rates – and it should be noted that such a change would represent a different cashflow profile from the current forecast position.

4.10.18. Based on the above, it is considered appropriate to retain the existing assumptions for the Base Cases in the OBC, but the implications of this announcement should be kept under review as the Projects progress through commercialisation to Full Business Case.

[1] *https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1029518/Policy_Costings_Document_FINAL.pdf*



4.11. Base Case Results – Wood Green

4.11.1. The table below shows the results of the Base Case for Wood Green.

[redacted]

4.11.2. This table shows positive returns for the Preferred Option. The Council, investing into the Project is remunerated on its investment in two ways, being through the payment of interest on debt lent to HESCO and through the receipt of dividends as a shareholder. In addition, the Council gains the benefit of retention of 30% of the business rates paid by HESCO. By necessity, as a result of the cash demands of HESCO, dividends are not available until the later years of the Project, after capital funding requirements and debt obligations have been met. The figure below demonstrates the returns profile of the HESCO.

[redacted]

4.11.3. From this, it can be seen that the business is able to have repaid all its debts by the end of the 40-year operational period, Following the repayment of debt, HESCO is in a position to pay dividends to the Council as shareholder. Note that the reduced income in 2048 and 2049 is due to significant cost to replace key items of plant in those years.

4.11.4. The analysis above has been prepared on the basis of a base case considered by the Council to reflect a reasonable level of scheme expansion and connection to the network over the initial build out of the network to 2023. As with the Tottenham Hale scheme, the customers modelled are considered to reflect a realistic connection proposition. Furthermore, as with Tottenham Hale, further potential customers have been identified which have not been included within the Financial Modelling, but which, if connected to the network in life, have the potential to increase the profitability of the network further.

Net Cash position of HESCO – Wood Green

4.11.5. An important consideration for potential investors is the net cash requirements placed on the investor in order to invest in the business. The figure below reflects the net cash position, from the perspective of the Council into the network; this includes all cash demands placed on the Council and all the receipts from HESCO. It is shown on a cumulative basis.

[redacted]

4.11.6. [redacted] While there are some demands from the business after this time, based on the profiled cash flows, the Council would not need to raise additional funds, as they can be met by the returns already received from the network (assuming they are ring fenced).

PWLB Repayment Risk – Wood Green

4.11.7. As detailed earlier in the Financial Case, the assumption is that the Council funding for HESCO is through borrowing from the Public Works Loan Board. This brings with it the risk of a misalignment between the amounts borrowed from the PWLB and the amount lent to HESCO. We have therefore calculated the difference between these two repayment profiles to understand the Council's exposure at a point in time. This is presented in Table 4.11-12 below.

4.11.8. The calculations below are made on the following assumptions:

- The Council makes an initial one-off drawdown from the PWLB in 2023 (when funding is needed to facilitate the continued construction of the Project;
- The length of PWLB borrowing is assumed to be 40 years.

4.11.9. From Table 4.11-12 below, it can be seen that, based on the timing of income and expenditure in the financial model, the Council is never in an 'exposed position' (i.e. owing money to the PWLB that it will not already have to hand/will not receive from the HESCO in-year).

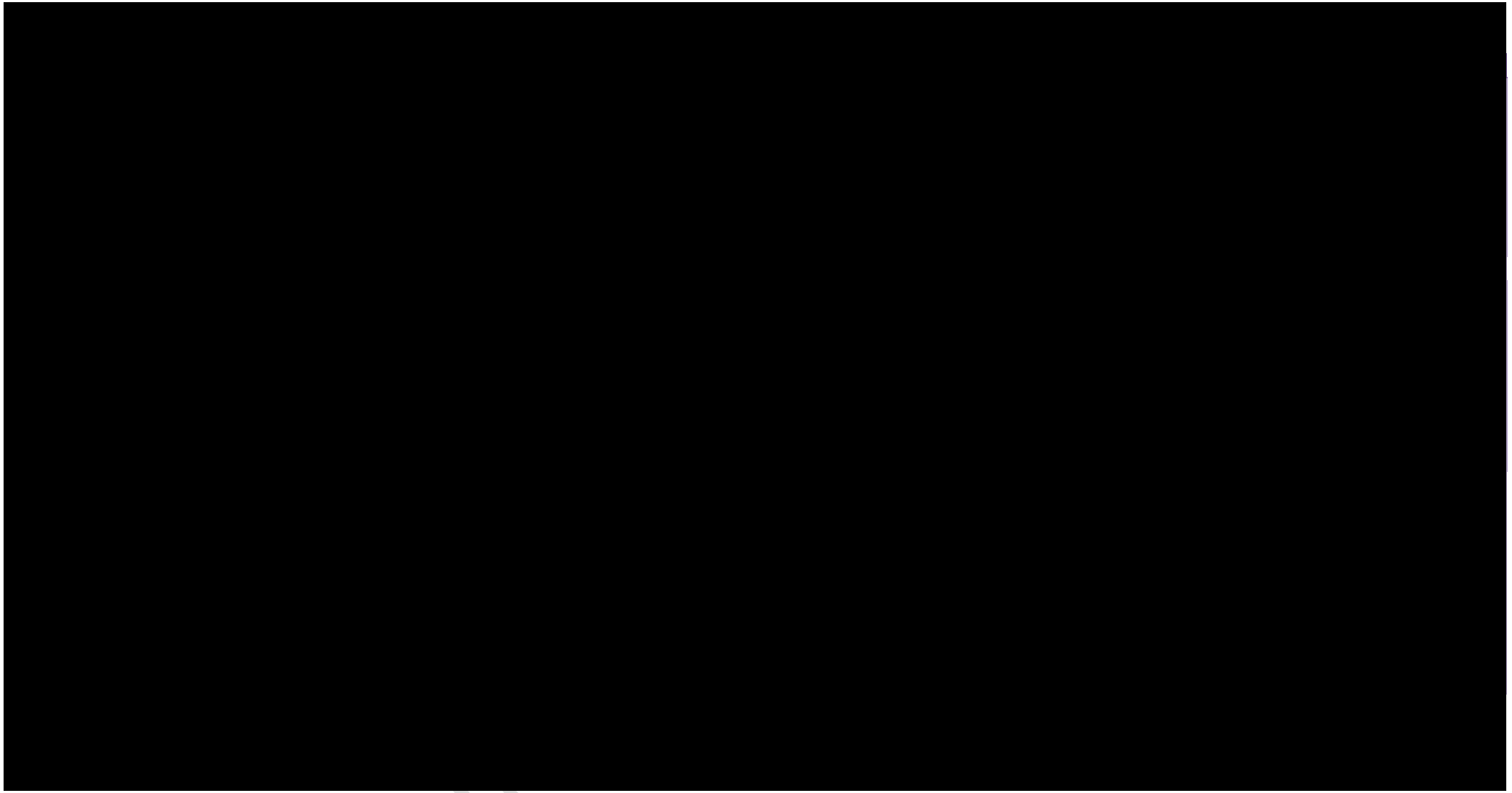
4.11.10. Factoring in the retention of 30% of business rates, and the Project assuming a revolving loan basis, HESCO is projecting to return more cash to the Council than the Council is obligated to pay under the PWLB assumptions made. [redacted] As noted below, the PWLB borrowing has been assumed on a simplified upfront basis for the purposes of modelling in this Financial Case. Through commercialisation and the development of the Full Business Case, the Council will continue to assess and determine the most appropriate borrowing strategy [redacted].

4.11.11. It is important to note the following two potential benefits that are not included in the table above:

- The surplus represents available funds that the Council could use in other activities, and which would contribute to its overall cashflow position, recognising that this will be fairly small in the scheme of the Council's annual cashflow. The potential benefit of this has not been accounted for.

- The simplifying, and prudent assumption has been made that the PWLB borrowing is made of a single amount at the commencement of the project. As an alternative, the Council could profile borrowing to align with project borrowing requirements, to reduce the level of interest payments. The approach used in the financial modelling does have the benefit of locking in the PWLB borrowing at the known interest rate.

4.11.12. In addition to the Base Case financial model, numerous sensitivities have also been modelled. Details of these and associated commentary are included in Appendix M of this Financial Case.



4.12. Optimism Bias

4.12.1. The programme of works has been developed by a full complement of technical, commercial and financial advisors. In addition to this, experienced staff within the Council and an independent 'critical friend' have been heavily involved in developing the scheme.

4.12.2. It should also be noted that the programme has been developed over time and has been subject to many stages of development. A significant amount of work has been carried out to identify the project parameters and identify the key issues and risks.

4.12.3. We consider that there is sufficient confidence in how the scheme has been developed and that a suitable level of due diligence has been carried out. There is a proportional contingency and risk allowance built into the programme, through which Optimism Bias has been addressed. For further information on Optimism Bias see Appendix P.

4.13. Sensitivity Testing

4.13.1. The robustness of the Base Case to change in assumptions has been tested through the sensitivities conducted, presented in full in Appendix M for Wood Green and Appendix N for Tottenham Hale. These consider the impacts of changes to the underlying assumptions, building upon the sensitivity work undertaken in developing the Base Case in the Economic Case, to determine how unexpected shocks to the system could impact on the viability of the network.

4.13.2. In the majority of instances, the network is able to withstand the impact of these changes and able to fully repay any modelled shareholder loans provided to HESCO by the Council in developing the network. It should also be noted that, while many of the sensitivities modelled can have an impact, there are contingencies in place that could minimise the impact of these changes. A brief summary of the most likely sensitivities, their impact on the scheme, and the mitigations in place, are described below.

Capex +/- 10%

4.13.3. Network Capex costs represent a significant cost of the Project, given its nature. A 10% increase would therefore represent a significant additional cost to HESCO and rely on additional loan to provide the funding to allow for the continued development of the network. This risk has been mitigated in the business case in a number of ways.

4.13.4. One is that additional contingencies of 10% have already been built into the Base Case forecast costs of the network. These costs have therefore already been adjusted to reflect a pessimistic view of the overall capital costs. The second is that detailed assessment of the required capex for each Project has been undertaken to date. This will continue as the Projects develop and will be refined further, maintaining and updating the Council's understanding of the likely costs of the network – allowing of the Council to be fully informed when making the decision whether to proceed with the network following commercialisation. Finally, it is expected that as part of the procurement for the network, HESCO will seek to agree fixed price Design & Build contracts with the private sector. While there is a premium for a fixed price contract, this will allow the prices to be known and ensure that the Council does not have to whether unforeseen changes in capital costs.

2040 No EfW supply

4.13.5. HESCO is seeking to reach a long-term supply agreement with the EfW for the supply of heat for the network. Where heat is not delivered, backup boilers can be utilised to ensure continuity of supply for network customers. However, there is a risk of EfW interruption due to an unforeseen circumstance – e.g. a fire, that could result in a temporary interruption in supply. To represent this, we have modelled a one year 'break' of heat supply from the EfW in the Appendices.

4.13.6. This has the impact of significantly increasing cost for a period of time, as the network relies upon gas supply to provide the energy required. The modelled sensitivity demonstrates the resilience of the network to a shock of this nature. While such breaks could not be tolerated indefinitely, both networks are able to whether this increased cost, without requiring additional financial support from the Council, and are still able to repay all debts provided by the end of the Project timelines.

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

4.14. Subsidy Control / State Aid

4.14.1. Where public authorities are lending or providing a grant or other financial assistance into a project, Subsidy Control must be considered, as this may in the case of a loan impose a floor on the interest rate that can be charged (to avoid subsidy control implications). [redacted]

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[redacted]

[redacted]

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[redacted]

[redacted]

4.19. Confirmation of the Solutions

4.19.1. The Base Cases for both Tottenham Hale and Wood Green are considered to represent the most suitable options as they give the Council control over the current and future development of the network. This scenario is shown to be viable as it generates sufficient cash to meet debt repayments, with an input of grant funding required to facilitate the development of the Project.

4.19.2. The technological solutions proposed are considered to be realistic and based on a detailed assessment compiled by AECOM, with support from WEC, over which Grant Thornton has overlaid various financing, indexation and taxation assumptions. The results are heat networks that can provide heat to the identified customer base over the 40-year period assessed.

4.19.3. Sensitivity testing conducted shows the Project has a resilience to adverse changes in assumptions. Grant funding can help mitigate the risk of this due to reducing the overall exposure of the Project.

[redacted]

[redacted]

[redacted]

[redacted]

Section 5: Management Case

5.1. Purpose of Management Case

5.1.1. The purpose of the Management Case is to explain the next steps on the project. It will set out:

- A programme of actions
- The financial and human resources needed to implement the programme
- The governance and project management procedures which will be implemented to ensure the project delivers the desired objectives and benefits

5.1.2. This is a combined Management Case for both the TH and WG projects because there are considerable overlaps. Generally, WG has can be considered as an extension of TH and so additional work is required to deliver it to work over and above TH. However, the projects have been split should the Council wish to proceed with TH alone.

5.1.3. It is important to note that the next stage of work is to take the concept outlined in this OBC and prove it by e.g.

- developing designs and obtaining necessary consents,
- completing a number of procurement exercises so that costs, terms and conditions and risk allocation are understood.
- completing negotiations with customers so that likely revenues, terms and conditions and risk allocation are understood.

5.1.4. This process is referred to as 'commercialisation'. At the end of the commercialisation work, a Full Business Case (FBC) will be prepared and presented to the Council as part of the next gateway approval. The consequence of approving the FBC is to enter into numerous inter-linked contracts with suppliers, customers and funders and before commencing construction and then operation.

5.1.5. The next section, section 5.2, sets out where the project currently sits in the project development process (e.g. see Figure 5.2-1) and provides an overview of the commercialisation work. [redacted]

5.1.6. [redacted]Section 5.6 then sets out the commercialisation work in detail. Section 5.9 briefly sets out the work that will follow approval of the FBC.

5.1.7. Sections 5.10, 5.15 and 5.18 set out the resources required to deliver the next phase of work, the governance processes that will be put in place and the project management approach respectively. Finally, Section 5.19 lists out the key decisions that will be sought from Cabinet as part of the approval of the OBC.

5.2. Overview of Project Development and Commercialisation

Model Project Development

5.2.1. The below image shows the typical development cycle for DENs from start (initial feasibility) to finish (operation).

5.2.2. The figure also shows the key activities at each stage.

5.2.3. The process sets out how a model DEN scheme will go through increasingly detailed rounds of feasibility in order to develop a detailed concept at the end of the 'Detailed Project Development' (DPD) stage.

5.2.4. The concept put forward in the Outline Business Case produced at the end of the DPD stage is comprehensive and detailed. However, it will be based on a number of assumptions e.g. that the project will be able to obtain the necessary consents to build the scheme and negotiate contracts and prices with suppliers and customers in line with those achieved in other, recently initiated similar schemes.

5.2.5. At this point, projects are not yet at a point where project developers can take a final decision and 'press go' on them. Therefore, OBCs normally seek approval to proceed with the commercialisation stage. This will enable the project developer to prove the concept and take various workstreams to a point where contracts and costs are finalised.

5.2.6. These contracts and costs are, in turn, used to feed into a Final Business Case (FBC) for the project. The FBC answers outstanding questions from the OBC and enables the scheme developer, in this case the Council itself, to make an informed final decision on whether to proceed with the projects.

5.2.7. Following approval of the FBC, projects move into construction and then through to operation.

5.2.8. Commercialisation will see the Council develop multiple contracts to the point where they can be signed. If the FBC results in a decision to proceed, these contracts would all be signed simultaneously and only then would the Council be committed to delivering the project(s).

Overview of Project Development for TH and WG

5.2.9. Both the TH and WG projects went through the techno-economic feasibility stage during the period 2015-2017 when the Council commissioned its decentralised energy masterplan and produced project-specific feasibility studies for TH and WG. The decision to progress to

5.2.10. Now that the OBCs have been produced, both projects are currently at the end of the DPD stage and facing the decision gateway about starting commercialisation.

5.2.11. As with the model scheme development described above, this OBC sets out a detailed and comprehensive concept about how the schemes can be set-up and funded. However, just like the

model development process, this concept is based on a number of assumptions which need to be proved through commercialisation.

5.2.12. Broadly there are six workstreams that need to be progressed which are:

a) Securing funding (internal and external) including 3rd party due diligence and preparation of FBC

b) Putting in place DEN operational arrangements including procuring 'Operation and Maintenance' (O&M) contracts, 'Customer Service and Billing' (CS&B) contracts and finalising policies and procedures (work is already underway to complete these tasks for the Council's HRA schemes and this can be extended to TH and WG)

c) Securing heat from Energetik (i.e. negotiating a contract to buy heat)

d) Setting up the SPV (i.e. deciding the company structure, governance, articles of association, shareholder agreement, board and staff structure, etc.)

e) Obtaining prices for delivering the physical DEN assets (this will involve some design work and obtaining some consents and negotiating contracts and prices with an installer to complete the design/consent process and install the assets) –

f) Customer acquisition (i.e. confirming connection and supply contracts together with associated charges with a variety of customers)

5.2.13. The final five tasks all effectively feed into the first task. Note also that the final two workstreams can easily be split between TH and WG whereas the first four preceding workstreams are essentially shared between the projects. Greater detail on the commercialisation work streams is provided in Section 5.6.

[redacted]

[redacted]

5.2.16. A full schedule has been developed to highlight the Tottenham Hale and Wood Green projects, with a high-level summary shown in the figure below. The schedule has been divided into phases, which have been used to structure this management case.

5.2.17. **Governance** – there will need to be ongoing governance of the project(s). This is described in more detail in section 5.15.

5.2.18. Note that this is only shown towards the end of the commercialisation phase. That is because proposals for the future governance post-FBC will be developed in a separate Cabinet paper setting out the proposed design and governance of HESCO – once the FBC is approved (or possibly earlier), HESCO will be set-up and operational with its own board of directors and so a new system of governance will operate. Current thinking is the Council would maintain oversight of the HESCO board by setting up a specific Shareholder Committee to oversee HESCO's performance.

5.2.20. **Commercialisation Phase** – Commercialisation is a broad 'catch-all' topic, which facilitates the development of the project to FBC in order to prove the concept set out at OBC. See also 5.2.12 and Section 5.6 for more detail.

Subsequent Project Development Phases

5.2.21. Figure 5.2-16 also shows some subsequent project development phases post-commercialisation for information purposes.

5.2.22. **Construction Phase** – This covers the detailed design and build of the DEN, including the energy centres and network leading to the connection to initial loads. These activities (other than enabling works) will not commence until after FBC and the FBC will include detailed proposals for how this will be managed.

5.2.23. **Operation & Expansion** – this task covers all actions to facilitate the supply of heat. These activities will not commence until after the Construction Phase (although in reality, some construction is likely to continue in parallel to operation as the scheme expands). The FBC will include detailed proposals for how operation will be managed.

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

5.4.7. Some other parts of the spine of the heat network in Tottenham Hale, which need to be constructed to deliver the TH DEN, run through the developer Argent's land. Delivering these alongside the development of the site will also substantially reduce disruption and cost and so can also be considered as 'enabling works'.

5.4.8. These works will need to be installed by Argent's contractors as part of its development of the site. The planning agreement foresaw this need and includes a mechanism for the Council to request that Argent funds and delivers these works. However, resource is required to manage the design and monitor the quality of works undertaken by Argent and there is a need for the Council to commit to adopting the pipework on Argent's land.

5.4.9. In addition to the spine pipes on Argent's land, Argent and other developers are building secondary networks within their buildings and sometimes buried final connections to their site boundary. Again, planning agreements have foreseen this need and require developers to work closely with the Council to review and approve proposals. This allows the HDEN team to ensure these discreet parts of the network are built to the right standard, ensuring a smooth interface. The capital cost for these works is covered by the developer's costs and the Council can recharge developers for their costs incurred reviewing the proposals (hence no budget is sought for these activities which will be ongoing alongside commercialisation).

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

5.6. Commercialisation Work

5.6.1. The core of the next phase of work is to prove the concept set out in the Commercial Case of this OBC.

5.6.2. This work can be broken down into six key tasks which together will feed into the FBC. The majority of the tasks are common between the TH and WG projects but some tasks are project specific.

5.6.3. The table below summarises the tasks and each task is discussed in more detail in the following sections.

Table 5.6-3 – Key Commercialisation Tasks

Task	Budget/resources	Description
1. **Secure funding**	Shared between TH & WG	Securing approvals from the Council (via FBC) and HNIP (by discharging conditions in the funding agreement) and from any other funders.
2. **DEN Operational Arrangements**	Shared between TH & WG	This task primarily involves procuring and agreeing contracts for Operation and Maintenance and Customer Service and Billing as well as some other peripheral contracts and defining key policies and service levels for the service once operational. This task is required for the Broadwater Farm project and it is proposed the TH and WG projects will share the same arrangements.

Task	Budget/resources	Description
		This is discussed further in sections 3.26 and 3.27[32].
3. Heat Offtake from Energetik	Shared between TH & WG	Developing the contract terms for the heat offtake agreement from Energetik (expanding on agreed commercial principles) including confirming price, availability, contract length and other key factors which have a major impact on the risk spectrum for the project. This task will be shared between the TH and WG projects. Further detail is provided in paragraphs 3.12.13 to 3.12.21
4. SPV	Shared between TH & WG	Agreeing the company structure that will be used to deliver the project including defining governance in detail and establishing tax exposure, etc. A single SPV is proposed to be used for both projects and so this task is shared between the TH and WG projects Direction of travel is set out in sections 3.6 and 3.8
5. Delivery of DEN Assets	Scheme by scheme	Developing designs, obtaining any necessary consents and procuring contractors / securing a price for delivery of assets (contracts ready to be awarded subject to approval of the FBC). This will be broken down into multiple packages and procurement options are discussed in section 3.23.3.22
6. Customer acquisition	Scheme by scheme	Finalising connection and supply agreements with those customers that will connect within the initial phase (subject to approval of the FBC) This will be delivered on a scheme-by-scheme basis as the customers are specific to each project. More information is provided in paragraphs 3.12.5 to 3.12.12

5.7. Shared Commercialisation Work.

Securing Funding

5.7.1. Implementing the project requires significant capital outlay as set out in the Financial Case. The funding plan for the project(s) proposes that this capital will be provided from a mix of Council prudential borrowing, Strategic CIL and Central Government grant funding.

5.7.2. The Council has provisionally made funding available in the MTFS and via the SCIL Spending Paper approved by Cabinet in December 202033.

5.7.3. Before the Council can confirm release of SCIL and the use of prudential borrowing, an FBC will need to be produced which sets out the results of the other commercialisation tasks (including securing Central Government funding) and so proves the concept.

Central Government Funding

5.7.4. Central Government funding (through the Department of Business, Energy and Industrial Strategy, BEIS) is available through the Heat Network Investment Project, HNIP, which is a competitively awarded source of capital funding for new DENs in England and Wales. The HNIP fund (£320m) is in its final rounds of award (ending in October 2021).

5.7.5. The HNIP scheme provides two types of funding:

- **Commercialisation funding** – this can fully cover the cost of commercialising a project and the only condition required for the funding to be released is approval of the OBC; and
- **Construction funding** – this will only ever cover part of the cost of building the network (and determining the level of funding is extremely complicated) and will have multiple conditions attached – the commercialisation work will provide the evidence to discharge the conditions

[32] Note current proposals are to outsource the initial running of the HRA Customer Service and Billing role from 2021-2024 with a view to bringing the service in house thereafter. It is likely that this service will be delivered by an in-house team for TH and WG from the start as these are not expected to start operating until 2024

[33] https://www.minutes.haringey.gov.uk/ielssueDetails.aspx?IId=71778&PlanId=0&Opt=3#AI66290

and so, by the end of commercialisation, the funding will be available (although, in practice, conditions will be discharged gradually through the commercialisation process).

[redacted]

[redacted]

5.7.7. Both TH and WG have been awarded HNIP funding. The details of the award for each scheme is discussed in more detail below. It is important to stress that a successful award of both commercialisation and construction funding in line with the amounts applied for is crucial for scheme viability.

5.7.8. The Cabinet report accompanying this OBC seeks approval to enter into the HNIP funding agreements for both Tottenham Hale and Wood Green.

Tottenham Hale HNIP

5.7.9. The HNIP offer for Tottenham Hale comprises of:

- £1.2m of commercialisation funding grant
- £3.4m of construction grant and £12.65m of low-cost loans.

[redacted]

5.7.10. The low-cost loan represents considerably cheaper borrowing than is normally available to the Council and the £12.65m on offer has been shown to have an equivalent impact to £3.1m of grant (to together make up an equivalent grant of £7.5m which is in line with the funding requested in the Council's application to HNIP)

[redacted]

5.7.12. The construction funding is not paid immediately but is subject to the Council clearing a series of conditions.

[redacted]

[redacted]

5.7.15. The Cabinet report accompanying this OBC seeks approval to enter into the HNIP funding agreements for Tottenham Hale DEN

Wood Green HNIP

5.7.16. The Wood Green HNIP offer comprises of:

- £0.85m of commercialisation funding grant
- £7.18m of construction grant and £2.56m of low-cost loans.

[redacted]

5.7.17. Similar to Tottenham Hale, the low-cost loan has been shown to have an equivalent impact to £0.82m of grant (to together make up an equivalent grant of £8.0m which is in line with the funding requested in the Council's HNIP application and assumed in the Economic Case when selecting the preferred technical solution)

[redacted]

5.7.19. The construction funding is not paid immediately but is subject to the Council clearing a series of conditions.

[redacted]

Potential Capital Funding from the Energy Company Obligation

5.7.22. Note also that the DEN Team has identified additional potential sources of capital funding to the project from the Energy Company Obligation (ECO). This is a Central Government scheme which requires large gas and electricity suppliers to invest in energy projects which benefit existing homes. The scheme is currently in its 3rd round and a fourth round has been confirmed. The timing of the TH and WG projects means it is likely to require funding from Round 4 of ECO where the exact requirements are unknown. However, if the project were to be implemented today in Round 3 of ECO, the connection of Broadwater Farm to the ERF would be expected to generate circa £1m for the Council. This funding stream will be monitored and investigated as the project progresses. If it is found to be viable, funding will be secured and fed into the project via the FBC.

5.7.23. Note that no ECO funding is currently assumed in the business case.

Completion of Full Business Case (FBC)

5.7.24. By the end of commercialisation, the Council will have the information required to compile the Full Business Case (FBC), undertake detailed 3rd party due diligence of the project and make a decision on whether to proceed with investing into the project.

Task Name	Duration	Start	Finish
Completion of Full Business Case	**192 days**	**Wed 27/04/22**	**Wed 01/02/23**
Development of FBC	7.5 mons	Wed 27/04/22	Fri 25/11/22
3rd Party Due Diligence	4 mons	Thu 26/05/22	Fri 16/09/22
FBC Issue	0 mons	Fri 25/11/22	Fri 25/11/22
Council Approval	42 days	Mon 28/11/22	Wed 01/02/23

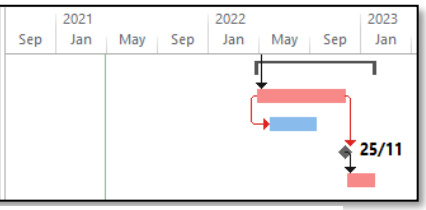


Figure 5.7-24 – Full Business Case

5.7.25. This will include the following deliverables from the workstreams set out below.

DEN Operational Arrangements

5.7.26. The Commercial Case proposes HESCO will use a number of service contracts to allow it to operate including O&M and CS&B contracts, both of which are critical to the successful delivery of the TH and WG projects.

5.7.27. It is therefore essential that the Council establishes the viability of these services in detail through engaging with the market to confirm contractual terms and prices.

5.7.28. However, the Commercial Case (section 3.26) highlighted that the Council needs to procure O&M and CS&B contracts to allow effective operation of several DENs in the HRA including the recently refurbished and expanded DEN at Broadwater Farm (BWF). The timelines are such that TH and WG can 'piggyback' on this procurement as the outcomes of the procurement will be available to feed into the FBC.

[redacted]

5.7.29. In terms of the CSB procurement, section 3.27 highlighted that the medium-term goal is for this to be a combined service across the HRA and HESCO and that this will most likely be delivered through the wider-Council family. In the short-term, the natural home for this service would be HfH but the ALMO is not currently in a position to mobilise to deliver the service to the timescales required for Broadwater Farm and other new Council housing blocks in Tottenham Hale. Therefore a short-term 'bridging' CSB arrangement will be put in place via the private sector.

Procurement of Operational Services – O&M and CS&B

5.7.30. As detailed in Section 3.26, BWF and other blocks in Tottenham Hale will be complete several months before the FBC for TH and WG is completed in late 2022. There is a need to procure O&M and CS&B services for these schemes, for which procurement has already started.

5.7.31. This ongoing activity is already resourced from the HRA and includes:

- an OJEU process using the negotiated procedure under the UCR2016 for O&M
- request For Quotation process to procure an interim CS&B service from the private sector

5.7.32. The O&M services are being procured in a way that enables them to be extended to the DENs in TH and WG e.g. the O&M contract:

- is designed to be expandable from BWF to include TH and WG; and
- includes a mechanism which allows the services to be split which allows novation of some of the services to HESCO (with the decision to novate to be taken as part of the FBC)

5.7.33. This arrangement is advantageous in terms of:

- leveraging the Council's buying power across the DEN programme to secure economies of scale for all schemes
- minimising procurement overheads by delivering services across the programme from as few procurements as possible; and
- ensuring as few providers as possible to minimise contract management in operation.

[redacted]

5.7.35. As procuring these service contracts are both BaU services, no additional budget has been requested under this OBC.

5.7.36. In terms of governance, the contract award for the O&M and contract variation for the CS&B will be taken independently by Cabinet outside of the FBC approval process to allow the service to go live for BWF as soon as possible. The short-term CSB contract will be below £0.5m and so will be awarded under delegated authority to the Director of Housing, Regeneration and Planning.

5.7.37. The FBC will include additional recommendations relevant to these services to e.g.

- Allow novation of relevant services from the Council to HESCO
- For HfH to provide a CS&B service to HESCO on similar terms as HfH provides them to the Council

Setting Charging and Customer Care Policies

5.7.38. Employing someone to carry out customer services and billing requires the Council (as the heat supplier for the HRA and as the shareholder of HESCO) to set its charging and customer care policies and procedures for the two services. [redacted]

[redacted]

Heat Offtake – Securing Heat from Energetik

5.7.41. The proposed DEN projects in TH and WG (and much of the wider longer-term DEN programme) is dependent on securing access to heat from the ERF.

5.7.42. While the ERF will be operated by London Energy Limited (LEL), LEL and the NLWA have recently signed an exclusive heat supply agreement with Energetik. While this is helpful in some ways (because Energetik has already begun construction of a network capable of transmitting heat from the ERF to the border between Enfield and Haringey and so reduces the cost of accessing the heat) it does mean that

- The Council /HESCO will need to agree a suitable heat offtake agreement with Energetik; and
- Energetik will be constrained in what it can offer the Council /HESCO by what it has agreed with LEL/NLWA

[redacted]

5.7.43. Haringey Council has had provisional discussions with Energetik on a heat offtake agreement with engagement taking place over the last two years. During this time, Energetik has been developing its own network expansion plans alongside progressing the offtake agreement with the North London Waste Authority and LEL who will own and operate the ERF respectively.

5.7.44. Discussions have been productive and helped inform the feasibility work and Outline Business Case. Engagement to date has sought to understand constraints and inform feasibility work rather than formal negotiation. The Council will need to comply with public procurement legislation and internal standing orders when buying any energy from Energetik. A route has been identified which makes use of an exemption in the Utility Contract Regulations to allow direct negotiation with Energetik (although a waiver to internal standing orders will still be required prior to contract award see 5.7.48). The contract with Energetik will be future-proofed so that the interconnection can accommodate all the potential loads under the HDEN programme.

5.7.45. The fundamentals of the proposed agreement are understood and have been fed into the analysis for the OBCs for TH and WG (taking a prudent view on the likely outcome of negotiations). The likely outcome of the negotiations has fed into the ERF being the preferred option for both TH and WG. The commercial and contractual details of these will be worked on as the Council moves towards the FBC.

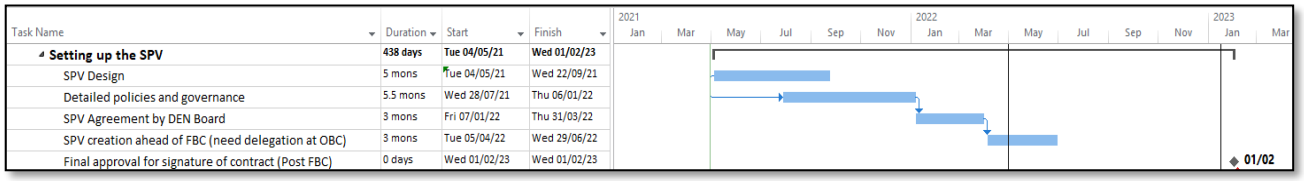
[redacted]

5.7.47. In terms of the price of heat from Energetik, while some uplift in price is reasonable to reflect the services Energetik is expected to provide in terms of managing call-off of heat from NLWA, transporting heat and potentially storing heat, this will need to be justified once the services are known. Here it is worth noting that Energetik has also been provided with funding from HNIP and one of the conditions of its funding is that Energetik sells heat to the Council at 'close to cost'. [redacted]

5.7.48. The Cabinet report which accompanies this OBC includes a recommendation for Cabinet to note that negotiations will be taking place with Energetik under an exemption in the procurement regulations. This negotiation is still procurement which falls under the Utilities Contract Regulations and the approach to negotiate directly is fully compliant with the procurement regulations, However, the Council's Contract Standing Orders are currently not drafted to consider the Utility Contract Regulations as almost all procurement by the Council falls under the Public Contract Regulations. Unless the CSOs are updated in the interim, a waiver will be required to the CSOs as part of the FBC to enter into contract with Energetik. The timeline for these negotiations aims to agree a final heat offtake agreement (subject to Cabinet approval of FBC) by mid-2022 i.e. in plenty of time to feed into the FBC. The final agreement will be signed as part of final investment decision (FBC) in 2023.

Setting up the SPV

5.7.49. The preferred legal structure recommended in the OBC for the heat network is currently a wholly owned company limited by shares established by the Council (see sections 3.5 and 3.8. This Special Purpose Vehicle (SPV) (called HESCO) would be a separate legal entity which can reach contractual agreements and hold assets in its own right.



Task Name	Duration	Start	Finish
Setting up the SPV	**438 days**	**Tue 04/05/21**	**Wed 01/02/23**
SPV Design	5 mons	Tue 04/05/21	Wed 22/09/21
Detailed policies and governance	5.5 mons	Wed 28/07/21	Thu 06/01/22
SPV Agreement by DEN Board	3 mons	Fri 07/01/22	Thu 31/03/22
SPV creation ahead of FBC (need delegation at OBC)	3 mons	Tue 05/04/22	Wed 29/06/22
Final approval for signature of contract (Post FBC)	0 days	Wed 01/02/23	Wed 01/02/23

Figure 5.7-49 - SPV Schedule

5.7.50. The details around HESCO (including e.g. articles of association, shareholder committee, HESCO board composition, reserved matters, etc.) will be developed following OBC approval and a follow-up Cabinet Report would recommend formation of HESCO in mid-2022.

5.7.51. This work will also allow tax exposure to be confirmed to feed into the assessment of financial viability.

5.7.52. A budget (see Section 5.11) has been allowed for this including internal and external legal and finance. The external legal and financial advisors, together with the critical friend, have experience of setting up several council SPVs for DEN projects and will bring experience of approaches taken elsewhere.

5.7.53. In terms of governance, the Cabinet Report setting out the detailed proposals for HESCO will be prepared by the DHRP on advice from the DEN Implementation Board (see section 5.15) in mid-2022 for approval.

5.7.54. While the company could be set up prior to FBC, the company structure would be reviewed as part of the due diligence of the FBC and there is scope for Cabinet to make changes to HESCO as part of the FBC decision.

5.7.55. It is considered beneficial to set up the company structure sooner for a variety of reasons including:

- a number of activities are taking place (including e.g. procurement, construction of assets under enabling works, etc.) where HESCO is best involved;
- an operating company aids negotiating with customers who are able to see how the company will work; and
- it allows for a smoother handover to HESCO, if and when the FBC is approved.

5.7.56. Section 3.23 sets out issues with the timing of setting up HESCO/entering into contract and explains how responsibility for delivering the Commercialisation activity could be transferred from officers to HESCO at that time. The precise arrangements for empowering HESCO would form part of the Cabinet Report which would set up the SPV (i.e. the Cabinet Report to set up HESCO would effectively refresh this management case and so those arrangements are not dealt with in detail here).

5.8. Project -Specific Commercialisation Work

5.8.1. The commercialisation activity above describes tasks which are common to both TH and WG. If the Council was to decide to deliver only one of the two projects, all of the work in section 5.7 would still be required.

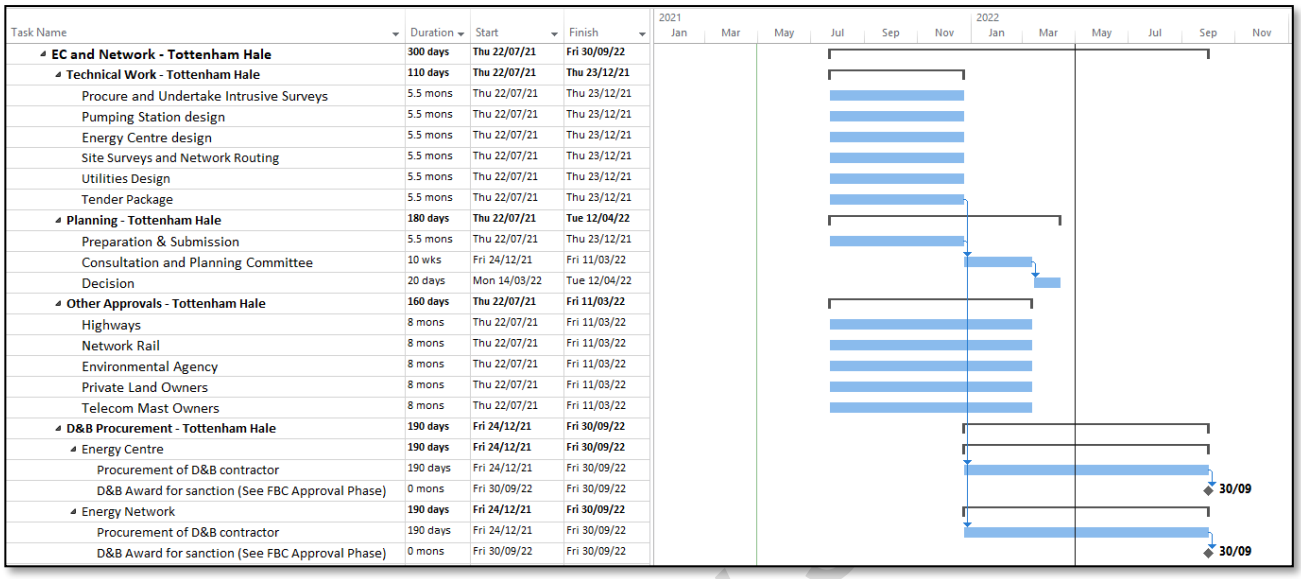
5.8.2. The following tasks deal with project-specific activities which are for either TH or WG and have been separated out so that the resources for each project can be separately identified and approved.

Delivery of DEN Assets – Tottenham Hale

5.8.3. The DEN Assets (i.e. the energy centre, plant and network) have currently been designed to an outline level sufficient to develop budget costs and identify the property rights and other consents that will be required to deliver the assets.

5.8.4. To prove the concept and allow the Council to make an informed decision at FBC on whether to proceed with the project, the Council needs to understand the actual costs and confirm the deliverability of the physical assets.

5.8.5. More work is required to develop the DEN designs and progress consents to the point where the Council can run a procurement for the construction of the DEN. This constitutes a number of design development sub-tasks which are set out below.



Task Name	Duration	Start	Finish
EC and Network - Tottenham Hale	**300 days**	**Thu 22/07/21**	**Fri 30/09/22**
Technical Work - Tottenham Hale	**110 days**	**Thu 22/07/21**	**Thu 23/12/21**
Procure and Undertake Intrusive Surveys	5.5 mons	Thu 22/07/21	Thu 23/12/21
Pumping Station design	5.5 mons	Thu 22/07/21	Thu 23/12/21
Energy Centre design	5.5 mons	Thu 22/07/21	Thu 23/12/21
Site Surveys and Network Routing	5.5 mons	Thu 22/07/21	Thu 23/12/21
Utilities Design	5.5 mons	Thu 22/07/21	Thu 23/12/21
Tender Package	5.5 mons	Thu 22/07/21	Thu 23/12/21
Planning - Tottenham Hale	**180 days**	**Thu 22/07/21**	**Tue 12/04/22**
Preparation & Submission	5.5 mons	Thu 22/07/21	Thu 23/12/21
Consultation and Planning Committee	10 wks	Fri 24/12/21	Fri 11/03/22
Decision	20 days	Mon 14/03/22	Tue 12/04/22
Other Approvals - Tottenham Hale	**160 days**	**Thu 22/07/21**	**Fri 11/03/22**
Highways	8 mons	Thu 22/07/21	Fri 11/03/22
Network Rail	8 mons	Thu 22/07/21	Fri 11/03/22
Environmental Agency	8 mons	Thu 22/07/21	Fri 11/03/22
Private Land Owners	8 mons	Thu 22/07/21	Fri 11/03/22
Telecom Mast Owners	8 mons	Thu 22/07/21	Fri 11/03/22
D&B Procurement - Tottenham Hale	**190 days**	**Fri 24/12/21**	**Fri 30/09/22**
Energy Centre	**190 days**	**Fri 24/12/21**	**Fri 30/09/22**
Procurement of D&B contractor	190 days	Fri 24/12/21	Fri 30/09/22
D&B Award for sanction (See FBC Approval Phase)	0 mons	Fri 30/09/22	Fri 30/09/22
Energy Network	**190 days**	**Fri 24/12/21**	**Fri 30/09/22**
Procurement of D&B contractor	190 days	Fri 24/12/21	Fri 30/09/22
D&B Award for sanction (See FBC Approval Phase)	0 mons	Fri 30/09/22	Fri 30/09/22

Figure 5.8-5 – Design, Approval and Procurement for TH

Technical Work at Tottenham Hale

5.8.6. The TH Energy Centre is estimated to have a footprint of around 550m2 including some tall plant (flues and thermal stores) with a footprint of around 100m2. It is proposed to locate this at the Flyover Site (beside and potentially underneath the A1055). This is an area of low-value Council-owned land covering approximately 500m2 of paved space directly underneath the flyover, with an area of around 700m2 adjacent to the highway. The area adjacent to the highway could be limited to taller plant or it could also house overspill plant to avoid locating it beneath the flyover– see below).

5.8.7. Further discussion is required with the Highways service to understand the constraints arising from constructing the energy centre in close proximity to the flyover and this will affect the extent to which the site spills over into the adjoining land. As discussed at section 3.16.8 there are range of factors to be taken into account before the location of the Energy Centre can be finalised and these will be worked up and addressed as we move to FBC

5.8.8. An additional pumping station is also planned to be located on Leeside Road, an area of Council-owned land, close to the Energetik / Council boundary.

5.8.9. Both locations and designs for the buildings will be finalised during commercialisation and the HDEN Team will carry out the required design activities to develop the TH Energy Centre building and fit-out to a suitable stage that it can go out to tender.

5.8.10. In addition, all required utility connections (gas, water and electricity) will be specified. The HDEN Team will work with the utility providers to ascertain connection costs, which can be used to inform the contractor.

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

Planning Approvals

5.8.14. All parts of the DEN that do not already have approval will need appropriate planning approval. The installation of heat pipes in the ground for a DEN is classified as “development” and as such requires planning permission. Refer to Appendix Q for further details.

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

- [redacted]
- [redacted]
- [redacted]
- [redacted]

[redacted]

5.8.25. One area of the network where a planning application is expected is in Down Lane Park where it is proposed to cross the culverted River Moselle in an above ground structure disguised as a gateway to the park.

5.8.26. The design of the proposed above ground structure is being coordinated between the DEN Team and Jon Sheaf Landscape Architects in coordination with Down Lane Park master planning. The structure may benefit from permitted development rights but the pipe run is likely to impact on some protected trees and so will need planning permission.

5.8.27. The TH Energy Centre (and buried pipes within the Council's land) will require planning approval.

5.8.28. If the EIA screening opinion is such that a full environmental impact assessment is required for the project, a larger planning application will be required.

5.8.29. The design development stage will include the preparation of the required material for planning applications as this is required to de-risk the project prior to procurement.

5.8.30. The planning applications will need supplementary work/documents such as ground investigations/contaminated land, dispersion modelling, design and access statement, construction management plan, drawings, acoustic monitoring and report, biodiversity impact assessment, utilities/drainage and fire risk assessment, energy/sustainability statements, waste management plan and crime prevention statements etc. There will also need to be community involvement and consultation.

5.8.31. The strategy for consultation with local residents and businesses and other stakeholders will be developed under the supervision of the DEN Implementation Board post-OBC.

5.8.32. The timescales for securing planning permissions are considered realistic and in line with the programme leading to the appointment of a D&B contractor.

Other Approvals

5.8.33. The DEN spans a large geographic area, and on occasion needs to cross, or be built in the vicinity of, existing infrastructure. Therefore, in order to construct the DEN, various permissions will be required. These have been identified; however further work is required to confirm the approvals.

[redacted]

5.8.34. The following table shows the various 3rd party approvals identified for each scheme. Note that this list is subject to finalisation during commercialisation because e.g. the network route may be redirected. The design information required to acquire the necessary permissions will be produced under the design development work. The HDEN Team will work with the relevant organisation to seek agreements in principle prior to procurement. The appointed D&B contractor will then be tasked with finalising full technical approvals as part of its detailed design and prior to construction.

[redacted]

Property Issues – Tottenham Hale

5.8.35. Provisional land searches have been done for proposed locations of the pump station and the TH Energy Centre and this has confirmed the sites are in Council ownership.

5.8.36. The majority of the network is in the public highway and so the Council can rely on statutory powers to obtain property rights to install the network. These pipes can then be transferred to HESCO with appropriate land rights at a later date (Commercial Case section 3.12).

5.8.37. Significant parts of the network are on Council land, e.g. connections to the TH Energy Centre or through Down Lane Park to Welbourne and through Building 1A, and it is assumed suitable property rights will be granted to HESCO.

5.8.38. Some of the network is on customer/developer land. Generally, this is a final connection to a building where the pipe will remain the responsibility of the developer. There is, however, some shared pipe (or 'spine' pipe) on developer land. This includes:

[redacted]

– shared pipe running through Argent land at Ferry Island – the planning agreement requires Argent to grant easements. These will need to be agreed as part of the Enabling Works see section 5.4

[redacted]

D&B Procurement

5.8.40. As detailed in Section 3.25, there are a number of D&B procurement activities that need to be undertaken. These packages are expected to be combined into a single OJEU procurement exercise for TH. This will be run under the UCR negotiated procedure, as per the schedule in Figure 5.8.5 (July 2021 – April 2022). It is proposed these will be packaged up as follows:

5.8.41. For Tottenham Hale, it is anticipated there could be up to 3 contract lots.

[redacted]

5.8.42. Because the two projects (TH & WG) are likely to have very similar timelines, there is likely to be scope to combine this into a single OJEU procurement with multiple lots. This option will be dependent on the schedule and any potential value to the Council from combining the procurements. Central Government's post-Brexit changes to the Public Contract Regulations announced in the Queen's Speech are highly unlikely to be enabled in time to affect the current procurement rules for large value contracts.

5.8.43. A full team will be required to tender these works. These roles and requirements are set out under the resource Section 5.10.

Customer Acquisition – Tottenham Hale

5.8.44. Acquiring customers is an ongoing activity that will continue throughout the life of the DEN. Customers will be acquired as and when their development programmes come forward.

Task Name	Duration	Start	Finish
Customer Acquisition - Tottenham Hale	**470 days**	**Mon 04/01/21**	**Mon 14/11/22**
Negotiate term sheets	12 mons	Mon 04/01/21	Fri 10/12/21
Prepare standard contracts	6 mons	Mon 15/11/21	Thu 12/05/22
Presentations to DEN Board ahead of formal offers	3.5 mons	Fri 13/05/22	Fri 19/08/22
Formal Offers - including approval under delegation	1 mon	Mon 22/08/22	Mon 19/09/22
Responses and contract finalisation	2 mons	Tue 20/09/22	Mon 14/11/22
Sign contracts	**0 days**	**Mon 14/11/22**	**Mon 14/11/22**

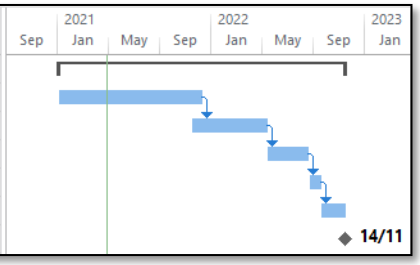


Figure 5.8-45 – Customer Acquisition - TH

5.8.45. Before proceeding with the schemes in TH, the Council needs commitment from a critical mass of customers (the initial customers), who will connect and buy energy from the DEN. This is a mix of new developments and existing buildings, covering housing and non-residential customers.

5.8.46. Preliminary discussions have been undertaken with customers where connection terms in line with those that other LAs have secured with developers have been proposed. This is effectively soft market testing. [redacted]

The Council as a customer

5.8.47. The existing sites are often Council-controlled buildings (e.g. Broadwater Farm) where the Council has visibility of existing arrangements and influence over future energy supply arrangements.

5.8.48. For existing Council housing schemes which would look to buy heat from the DENs, this service will need to be procured by the Council. While there is an exemption in UCR that allows the Council

to negotiate directly with HESCO for Broadwater Farm, there remains an obligation to comply with the Landlord and Tenant Act s20 if recharging this energy to leaseholders via service charges (current arrangement at BWF) and this normally requires a competitive process. [redacted]

5.8.49. As the TH DEN will be providing a significant amount of decarbonised heat, it is anticipated that £3.5m from the Housing Revenue Account (HRA) fund will be made available to facilitate the connection of BWF to the wider network (an existing fund has been created in the HRA to fund decarbonisation of the Council's housing stock). This is equivalent to the cost the Council would charge a new development to offset its emissions. Over the course of the commercialisation phase, the relevant funding requirement will be firmed up. Note: the connection charge at BWF won't be recharged to leaseholders so can be negotiated directly between HESCO and the Council

5.8.50. For new Council schemes (either developed by the Council or bought by the Council from another developer), where the planning permission for these schemes is subject to planning conditions / obligations requiring them to connect to the DEN and so the Council will not need to comply with public procurement rules to purchase heat [redacted].

5.8.51. Note that the purchase of heat by new HRA blocks applies only to bulk supply of heat to the Council as the landlord of the block. The Council could also invite HESCO to operate the network within the building and supply heat directly to residents. [redacted]

[redacted]

3rd Party Customers

5.8.53. The majority of customers are 3rd parties in the form of developers which are obliged to negotiate connection and supply agreements with the Council through their planning agreements.

5.8.54. The planning agreements vary somewhat from scheme to scheme but can be summarised as:

i. The developer must install a heating system which is compatible with the DEN and provide infrastructure on its site necessary to allow connection to the DEN and/or space provision for future infrastructure to be provided by the Council/HESCO.
ii. The developer must connect to the DEN and buy energy if the Council/HESCO makes a viable offer to the developer. The form of offer could include either i) a bulk supply to the developer/future building owner/landlord or ii) a service to supply to individual residents where HESCO would operate and maintain (and repair but nor own or replace) the secondary network in the block including providing customer service and billing to the residents.
iii. The Council and developer must use reasonable endeavours to agree an offer and engage one another regularly to discuss terms of connection and supply.
iv. A deadline for the Council to make an offer which is typically 10 years.
v. The offer from the Council needs to include:
    a. A credible business plan and programme for delivery of the wider network
    b. A connection agreement including technical details and programme for works on the developer's site with costs not exceeding those agreed in the s106
    c. Terms and conditions for supply including tariffs, service levels, etc.
    d. Any access/property rights required.
vi. The developer assesses viability based on:
    a. Technical suitability including carbon performance; and
    b. Fair and reasonable commercial terms including standards of service (where the Heat Trust standard is frequently quoted as a minimum).
vii. If there is disagreement on viability, there is a referral process for determination by an independent expert

5.8.55. It is proposed to follow this process for new build schemes.

5.8.56. Some existing buildings are 3rd party customers. In Tottenham Hale, this applies to Harris Academy in the initial wave of customers (although later plans to extend to Hale Village and Tottenham Green will involve existing buildings owned/occupied by 3rd parties).

5.8.57. For Harris Academy, the Council has existing links that can facilitate negotiation of an agreement. The Academy will also be able to access funding from the GLA to cover the full cost of employing representatives to negotiate on their behalf.

5.8.58. There is also a changing regulatory regime for heat that will provide incentives to existing customers to decarbonise. For example, Hale Village is a very large DEN in its own right operated by Veolia. It currently operates primarily on gas CHP. This will limit future expansion and mean that regulatory imperatives to decarbonise trailed by BEIS in a recent energy white paper will bite sooner.

Governance of Customer Acquisition

5.8.59. Resource is included in this OBC to allow negotiations with all customers to progress from provisional offers to final agreements.

5.8.60. There is a need for the Council/HESCO to make final offers to customers ahead of FBC (but subject to approval of the FBC by Cabinet) so that these offers can be reviewed by customers who can indicate if they are willing to accept. Currently various officers are empowered through the scheme of delegations to engage with external parties on revenue generating opportunities as long as they work closely with the CFO. [redacted]

[redacted]

5.8.62. Note: agreements would only be entered into once the FBC is approved (FBC would see HESCO enter simultaneously into multiple agreements, to build and operate the network and buy and sell energy).

5.8.63. The Cabinet report accompanying this OBC includes recommendations for Cabinet to note that customer acquisition will be ongoing.

Delivery of DEN Assets – Wood Green

5.8.64. As per TH, WG will require the progression of design work to an appropriate stage to feed into the FBC and enable the required approvals. There are some differences between WG and TH and these are discussed below.

[redacted]

Technical work at Wood Green

[redacted]

5.8.66. However, fit-out of the space and remaining utility connections will be carried out by the HESCO. A design is therefore required to be progressed to a suitable stage where these works can go out to tender.

[redacted]

[redacted]

Planning Approvals

5.8.69. As with TH, all parts of the DEN for WG will need appropriate planning approvals.

5.8.70. Some parts of the system already have planning permission, and, subject to the requirement for an EIA, some can be delivered under permitted development rights (and then transferred to HESCO).

5.8.71. The WG Energy Centre already has planning permission. There are some remaining conditions that HESCO will need to discharge as part of the fit-out. [redacted]

[redacted]

Other Approvals

5.8.73. The DEN covers a large geographic area, and on occasion needs to cross or be built in the vicinity of existing infrastructure. In order to construct the DEN, various permissions will be required. These

have been identified; however further work is required to confirm the list of approvals as the network route is still subject to change.

5.8.74. The following table shows the various 3rd party approvals identified for WG. The information required to acquire these permissions will be produced under the design development work. The DEN Team will work with the relevant organisation to seek agreements in principle, which will be finalised by the D&B contractor once the construction phase starts.

[redacted]

Property Issues – Wood Green

5.8.75. St William (StW) is contractually bound to provide a lease of the WG Energy Centre to the Council via its planning agreement. The Council needs to enter into negotiations early in 2022 to ensure the lease is suitable. The Council will then sub-let to HESCO.

[redacted]

D&B Procurement

5.8.79. As detailed in Section 3.25, there are a number of D&B procurement activities that need to be undertaken. These packages are expected to be combined into a single OJEU compliant procurement exercise for WG (probably in tandem with TH). The procurement will be under the UCR using a negotiated procedure, as per the schedule in Figure 5.8.64 (July 2021 – April 2022). These will be packaged up as follows:

5.8.80. For Wood Green, it is anticipated there will also be up to 3 contract lots.

[redacted]

[redacted]

5.8.81. As detailed above, TH and WG have very similar timelines and there is likely to be scope to combine this into a single OJEU procurement with multiple lots.

5.8.82. A full team will be required to tender these works. These roles and requirements are set out under the resource Section 5.12.

Customer Acquisition – Wood Green

5.8.83. Acquiring customers is an ongoing activity that will continue throughout the life of the DEN, as customers will be acquired as and when their development programmes come forward.

Task Name	Duration	Start	Finish
Customer Acquisition - Wood Green	**509 days**	**Mon 02/11/20**	**Mon 14/11/22**
Negotiate term sheets	12 mons	Mon 04/01/21	Fri 10/12/21
Prepare standard contracts	6 mons	Mon 15/11/21	Thu 12/05/22
Presentations to DEN Board ahead of formal offers	3.5 mons	Fri 13/05/22	Fri 19/08/22
Formal Offers - including approval under delegation	1 mon	Mon 22/08/22	Mon 19/09/22
Responses and contract finalisation	2 mons	Tue 20/09/22	Mon 14/11/22
Sign contracts	**509 days**	**Mon 02/11/20**	**Mon 14/11/22**

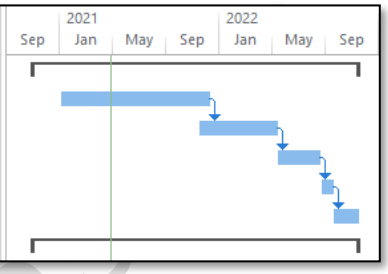


Figure 5.8-84: Customer Acquisition WG

5.8.84. Much of the approach to customer acquisition is as per TH.

5.8.85. It is worth noting that the time pressures for customer acquisition in WG are quite different as the deadline for the Council to make a final offer to StW is October 2022 which is much shorter than for other new build schemes.

5.9. Subsequent Phases – Construction and Operation

5.9.1. Upon FBC approval, construction will commence as per the programme below. Upon completion of the works, and in a phased manner, the network will connect to the various heat offtakers.

5.9.2. The initial construction phase is expected to be followed by a rolling programme of connections to new customers over time.

5.9.3. While this OBC is seeking approval to proceed with the commercialisation tasks, the decision on construction and operation happens at the FBC stage and so limited information is provided on these tasks at this stage.

Task Name	Duration	Start	Finish
Construction Phase	**862 days**	**Tue 27/04/21**	**Wed 11/09/24**
Operation & Expansion	**480 days**	**Thu 12/09/24**	**Wed 15/07/26**
Tottenham Hale	24 mons	Thu 12/09/24	Wed 15/07/26
Wood Green	24 mons	Thu 12/09/24	Wed 15/07/26

Figure 5.9-3 - Level 1 Construction and Operation Programme

5.10. Summary Costs

5.10.1. The costs associated with taking the project to FBC and enabling works required to deliver planning commitments are shown in summary below:

[redacted]

5.10.2. The overall costs for Tottenham Hale are £3.2m [redacted]. Note that this includes several tasks which also help to deliver the Wood Green project but excludes the cost of the DEN operational agreements which are estimated at [redacted] because these costs are already met from an agreed HRA budget.

5.10.3. Within this is a total cost of £165,500 for the DEN Team and £103,000 for wider Council staff.

5.10.4. The overall costs for Wood Green are £2.2m [redacted]. Note this excludes the cost of several tasks which are common with Tottenham Hale as these are included in the cost for that project.

5.10.5. Within this is a total budget of £98,375 for the DEN Team and £45,625 for wider Council staff.

5.11. Proposed Budget / Funding Sources

5.11.1. Table 5.10.1a and Table 5.10.1b identify estimated costs for the delivery of the two projects and proposed funding streams for different activities.

[redacted]

5.11.3. Thus, the HNIP funding is anticipated to be sufficient to fund the work up to FBC.

5.11.4. It is worth noting that the GLA recently launched its new £6m Local Energy Accelerator (LEA) programme which will cover commercialisation costs (but not capital costs associated with enabling works). If commercialisation costs exceed the HNIP commercialisation award, it is considered likely that LEA funding will be made available.

5.11.5. The GLA's LEA programme also includes a 'programme delivery unit' of expert advisors employed to support local authorities in the delivery of DEN projects. There may be scope to agree someone from the Programme Delivery Unit is embedded within the Council's DEN Team and this is discussed further in the following section.

5.12. Proposed Team

5.12.1. The human resources to deliver the next phase of the projects to FBC (i.e. enabling works and commercialisation) will be made up of:

Table 5.12-1: Proposed Resources

Resource	Budget TH	Budget WG
Council DEN Team	£165k	£98k
Wider Council Team (e.g. dedicated finance, legal, procurement and highways support)	£103k	£46k
[redacted]	[redacted]	[redacted]

5.12.2. The in-house team is proposed to be made up of the following indicative structure:

Table 5.12-2: Team Structure for TH and WG up to FBC

Council DEN Team	FTEs TH	FTEs WG
Head of Team PO8	0.6	0.2
DEN Specialist – Asset Delivery Focus PO7	0.4	0.2
DEN Specialist – Commercial Focus PO7	0.4	0.2
PMO PO5	0.5	Included in TH
Wider Council Team	FTEs TH	FTEs WG
Finance	0.25	Included in TH
Legal	0.25	0.1
Procurement	0.25	Included in TH
Highways	0.5	0.25

Wider DEN Team and Interaction with HRA

5.12.3. The Council DEN Team identified for the next stage of work covers 2.5 FTEs across 4 roles. However, the DEN team will also service other areas in the Council [with current workload] including:

- North Tottenham/High Road West [0.5FTEs]
- Broadwater Farm (existing) [0.5FTEs]
- Broadwater Farm (regeneration) [0.1FTEs and rising]
- New HRA blocks [0.5FTEs]
- Support to planning on policy and development control outside of DEN area [0.1FTEs]

5.12.4. Hence the workload for the wider DEN Team requirement is currently closer to 4.2 FTEs but growing.

5.12.5. The Council is currently employing 3xFTEs in the DEN Team:

- Energy Infrastructure Manager PO7 – permanent [across all DEN work]
- Principal DEN Operations Officer PO7 – 2yr fixed term contract [Broadwater Farm and the HRA]
- A temporary PMO to support production of OBC and transformation of governance.

5.12.6. Recruitment is recommended to resource the TH and WG projects. Recruitment is likely to be on a fixed-term basis and could include secondments.

5.12.7. The resource requirement of the DEN Team across different skillsets identified here is for the next stage of work (to FBC). This requirement will change over time as TH and WG evolve from commercialisation to construction and operation.

5.12.8. Similarly, the resource requirement and skillset in the other work areas will also change. For example, work is increasing in North Tottenham and Broadwater Farm as regeneration projects take off. The skillset at Broadwater Farm and for the HRA has been asset delivery led but has now shifted towards operation and asset management at Broadwater Farm and new housing blocks will be operational from early 2022.

5.12.9. Note that the Council DEN Team could be TUPEd across to HESCO to fill similar roles once the set-up of HESCO has been approved.

5.12.10. Note that once HESCO is implemented, the Council will effectively have two heat supply businesses: HESCO and the HRA. It is recommended that the Council creates a single centre of

expertise for DENs within HESCO and HESCO is given responsibility for asset management of the HRA heat business and there are several ways this can be achieved, for example:

- HESCO is employed as a managing agent by the Council funded from the HRA. The management agreement would need to set clear responsibilities between HESCO, the Council and HfH.
- The Council lets a concession for an ESCO to operate the heating systems within the HRA which HESCO would need to bid for and win
- Note the commercialisation work for TH and WG do not include implementing either of these options to unify the management of the Council's two heat supply businesses. This is a complicated endeavour and a separate workstream in its own right.

5.13. External Advisors

Critical Friend

5.13.1. Woodward Energy Consulting (WEC) acts as critical friend to the Council. WEC acts in the Council's interests in the delivery of the project and supplements the in-house DEN Team resource in managing the delivery of the project. WEC provides expertise in district heating, covering commercial structuring, contract negotiation, procurement strategy, techno-economic modelling and reviewing the outputs of the other advisors. The Council critical friend contract was renewed in late 2020. The contract has a fixed value and is charged on a time basis. The current budget may need to be extended to take the TH and WG project to FBC.

[redacted]

Technical Advisors & Programme Managers

5.13.3. AECOM is appointed as technical advisor on a 3-year term contract which started in 2020 and has an option for a 1-year extension. Its role covers multidisciplinary engineering, programme management, architecture, sustainability and energy advice. This includes producing:

- Concept and developed designs for specific aspects of the scheme
- Development of technical tender documentation for various procurement exercises
- Technical support during procurement processes
- Technical information for the energy centre planning application
- Techno-economic modelling (working with WEC)
- Programme management support
- Procurement and commercial advice (via Hermetica Black)

[redacted]

Legal Advisors

5.13.5. Bevan Brittan is appointed to provide legal advice on a 3-year term contract which started in 2020 and has an option for a 1-year extension. Its role includes:

- Heat purchase agreement with Energetik
- Property agreements (EC leases, easements, etc.)
- Developing the connection and supply agreements in bulk and residential form
- Funding agreement with the Heat Network Investment Project
- Formation of the SPV and agreements between the Council and the SPV.
- Design, build, operate and maintain contracts and procurement processes.

[redacted]

Financial Advisors

5.13.7. Grant Thornton is appointed as financial advisor on a 3-year term contract which started in 2020 and has an option for a 1-year extension. Its role covers financial modelling, tax advice. This includes producing:

- Financial model
- Delivery vehicle options

[redacted]

3rd Party Due Diligence

5.13.9. An independent third party will need to be procured to provide due diligence of the FBC and information that feeds into it. This is a discrete piece of work which will be required in late-2022. [redacted]

5.14. Governance Introduction

5.14.1. The TH and WG projects involve significant capital expenditure and the set-up of a new service which needs oversight at a high level in the Council. Furthermore, the set-up of an SPV of this scale is a significant decision for the Council and recent experience in e.g. Nottingham City Council and the London Borough of Croydon have identified potential pitfalls in the management of large Council-owned companies.

5.14.2. The governance can also be broken down into distinct phases as set out below:

1. Approval of the OBC [November 2021]
2. Oversight of commercialisation [redacted] and start of preparation of FBC by officers
3. Approval of set-up of HESCO [mid-2022]
4. Oversight of operation of HESCO up to OBC including completion of the FBC by HESCO
5. Approval of FBC [early 2023]

5.14.3. Approvals of the OBC, set-up of HESCO and FBC are Key Decisions with values well in excess of £0.5m and so will require Cabinet Decisions.

5.14.4. As part of the OBC approval, Cabinet will also approve the interim governance to oversee commercialisation, [redacted] and preparation of the FBC by officers.

5.14.5. There is an assumption that a decision will be sought to set-up HESCO prior to FBC in mid-2022. Although this is optional, it is recommended due to the volume of activity being undertaken and the scale of enabling works where HESCO will need to start owning assets. The paper to set-up HESCO will include the governance to oversee the operation of HESCO up until FBC.

5.14.6. Similarly within the FBC, Cabinet will approve the governance to oversee the future operation of HESCO.

5.14.7. The following section sets out recommendations for the governance between OBC and set up of HESCO.

5.14.8. Subsequent reports for the set-up of HESCO and the FBC will include detailed recommendations for the governance of HESCO pre- and post-FBC. Some thinking is included here to give an indication of direction of travel.

5.15. Governance between OBC and Set-up of HESCO

5.15.1. As already highlighted above, the TH and WG projects require numerous significant negotiations to be finalised ahead of contracts being presented to Cabinet for a decision as part of the FBC.

5.15.2. However, given the number of these negotiations and compressed nature of the programme, the Cabinet report accompanying this OBC asks Cabinet to note that negotiations by officers will be ongoing

5.15.3. To date, the development of the DEN Programme and this OBC has been overseen by the DEN Board which is an advisory board rather than a decision-making board.

5.15.4. It is recommended that the DEN Board remains as an advisory board but that greater time is spent updating Cabinet members on progress with negotiations or perhaps the board membership is adjusted to include Cabinet Members. This proposed expanded board is referred to as the DEN Implementation Board in order to distinguish from the current DEN Board. In this way, the DEN Implementation Board will have oversight of key developments of the DEN programme prior to FBC. It should also be noted that the majority of these negotiations will ultimately be subject to approval of the FBC by Cabinet and so, while choices taken by officers as part of the negotiation process will limit the Council's options to make changes, they will not commit the Council to implementing the project(s).

5.16. Governance of HESCO post-set-up

5.16.1. Section 3.8 of the Commercial Case provides a high-level proposal for the governance of HESCO including the set-up of a Shareholder Committee (as a committee of the Cabinet) and a board of directors for HESCO itself. A shareholder agreement (and to a lesser extent articles of association) will frame the relationship and respective responsibilities between the Shareholder Committee and HESCO Board.

5.16.2. This set-up envisages that the Shareholder Committee will take on much of the Council's decision making in a stakeholder capacity with regard to HESCO but also that a significant degree of independence will be delegated to HESCO Board, similar to those given to Directors of Council departments, to ensure delivery of the business plan while acting in the company's best interests.

5.16.3. This is a tried and tested form of governance for local authority companies. The Shareholder Committee provides member oversight and scrutiny of HESCO, whilst simultaneously reducing the likelihood of conflicts of interest and perceived bias arising, as members do not sit on the HESCO Board. The Shareholder Committee needs to show rigour in challenging underlying assumptions in business plans and budgets, to protect the Council's position, whereas directors sitting on the HESCO Board are charged with the operations of the company and are duty bound to act in the best interest of the company.

5.16.4. Figure 5.16 – Evolution of Governance during project lifespan

5.16.5. The Figure below shows how governance might evolve during the project lifecycle.
The thickness of the red outline is intended to represent the indicative importance of decisions / degree of control exercised over the project. The advisory DEN Implementation Board (supplemented by potential external experts) eventually morphs into decision-making boards in the form of:

- the Shareholder Committee that will drive the SPV and
- the HESCO Board.

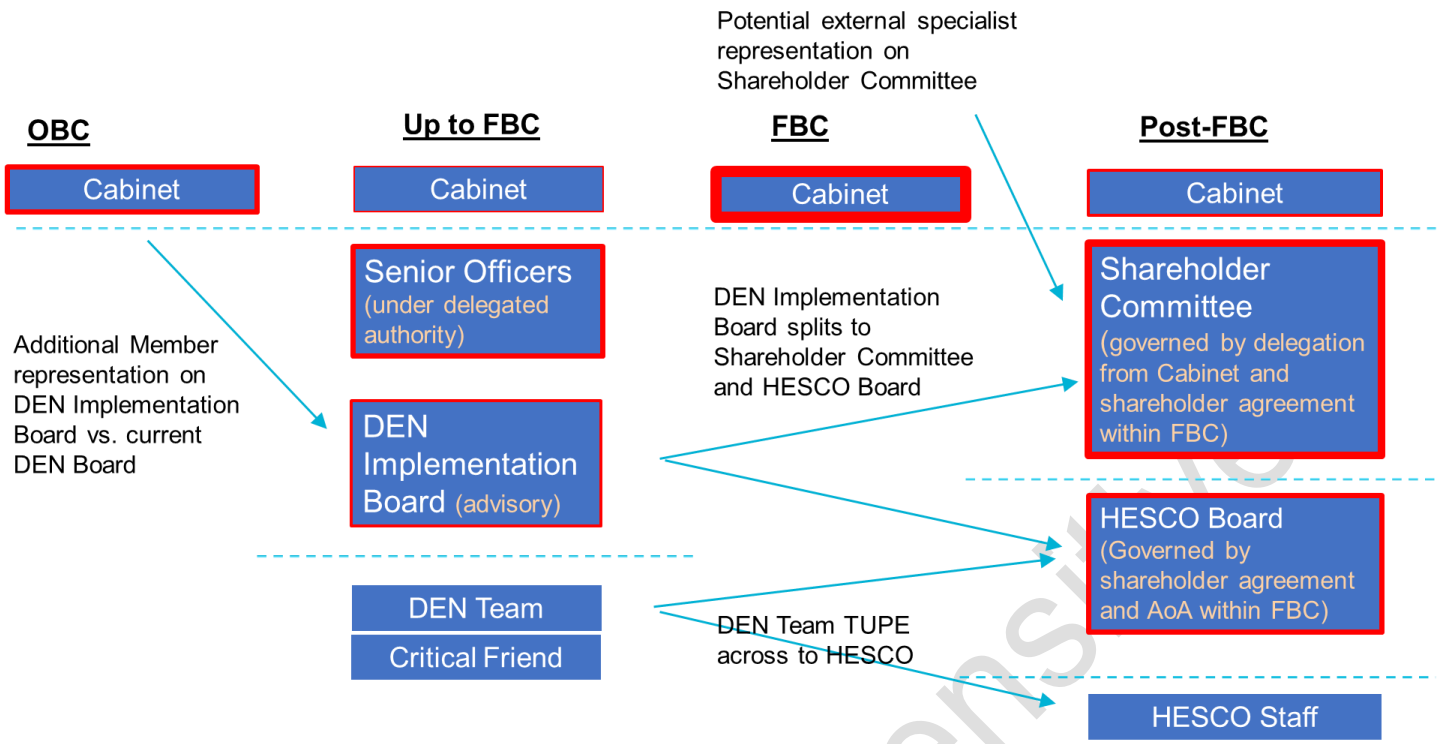


Figure 5.16 – Evolution of Governance during project lifespan

5.17. Stakeholder Management and Communication

5.17.1. A stakeholder mapping exercise has been undertaken to identify internal and external stakeholders, their degree of influence to the project and the extent to which they are aware of and supportive of the project.

5.17.2. Once this process is complete, a communication plan will be developed under the auspices of the DEN Implementation Board.

Internal Stakeholders

5.17.3. Internally, the current governance arrangements via DEN Board includes representation from key areas of the Council.

5.17.4. The DEN Implementation Board will adapt the current DEN Board to ensure improved visibility of the project(s) by Members.

5.17.5. The DEN project is a significant cross-cutting project which interacts with many areas across the Council. Because of this, the DEN Team will also engage with other key internal boards, working groups, etc. to ensure information on the programme is cascaded to affected people within the Council and that the DEN Programme remained informed of developments in other areas of the Council.

External Stakeholders

5.17.6. External stakeholders can broadly be split into five groups:

1. Local people and businesses indirectly affected by the project,
2. Infrastructure owners directly affected by the works and statutory authorities that will approve works,
3. Customers (including developers),
4. Suppliers, and
5. Policy makers and funders.

5.17.7. The approach to engaging and communicating with each of these groups differs and sometimes the approach to different stakeholders within the same category will differ. For example, differing approaches are required with customers depending on whether they are small existing buildings or large developers with the latter typically being more familiar with DENs and mandated, and so suitably resourced, to engage with the project). Similarly, there may be different pressure groups within the local community that have strong views on e.g. climate change or roadworks and, again, the engagement will need to be tailored.

5.17.8. Much of the communication with groups 2, 3 and 4 will take place within relatively well-defined frameworks (e.g. the New Roads and Street Works Act provides a framework for undertakers to engage with infrastructure owners, most customers will be following processes set out in planning agreements, most suppliers will be engaged through structured procurement, etc.).

5.17.9. However, some stakeholders require more tailored engagement and a detailed communication strategy will be developed under the oversight of the DEN Implementation Board. This will need to address some key issues including:

- The consultation process with local residents and businesses

[redacted]

5.18. Programme management

5.18.1. The Council has been running the DEN programme for a number of years, managed by the Council's Carbon Management service. The Assistant Director for Planning, Building Standards and Sustainability (AD PBSS) is the project sponsor. The lead member is the Cabinet Member for Climate Change and Sustainability.

5.18.2. Several changes to the staff structure are proposed in section 5.12. Alongside this, the Council needs to ensure that the management needs of the programme are identified and properly resourced and remunerated.

5.18.3. This DEN Team will be responsible for the project management and delivery of the enabling works and commercialisation workstreams set out in this OBC and for moving the project through the various approval cycles working closely with the DEN Implementation Board.

5.18.4. Project management processes will follow the Council's project management framework which is broadly in line with PRINCE2. The 3rd party due diligence processes will align with BEIS guidance on due diligence (where BEIS has produced a standardised set of due diligence requirements tailored to DEN projects) and the FBC will be produced in accordance with HMT Green Book Guidance.

5.18.5. The dedicated programme management resource will lead on updating and maintaining the following documentation:

- A project execution plan – which is regularly reviewed and updated. This should set out the project objectives, scope, exclusions, resources, governance, benefits, risks, issues, dependencies, map stakeholders and comms, etc.
- A well-developed schedule (Level 1 schedule and Level 2 schedules for OBC and FBC) alongside regular programme review meetings
- Risk register and regular risk review meetings.
- A Benefits Realisation Strategy (BRS) setting out the approach and framework that the DEN programme will use to manage the realisation and delivery of benefits. This is key to the continued success of the project(s) and ensures that the Council keeps a watching brief on HESCO, based on if it is doing well, or poorly.

- A stakeholder management and communication plan that ensures the variety of stakeholder needs are met and appropriate governance over the project is in place (including briefing notes, FAQs and similar materials to streamline communications)
- Regular highlight reports including updates on recent and forthcoming activities, financial spend vs. forecast reports, progress updates against programme, and irregular project spotlights where risks will be explored in more detail.

5.18.6. The majority of the above has been produced over the course of the OBC and will need further updates once the OBC is approved and we move towards the FBC.

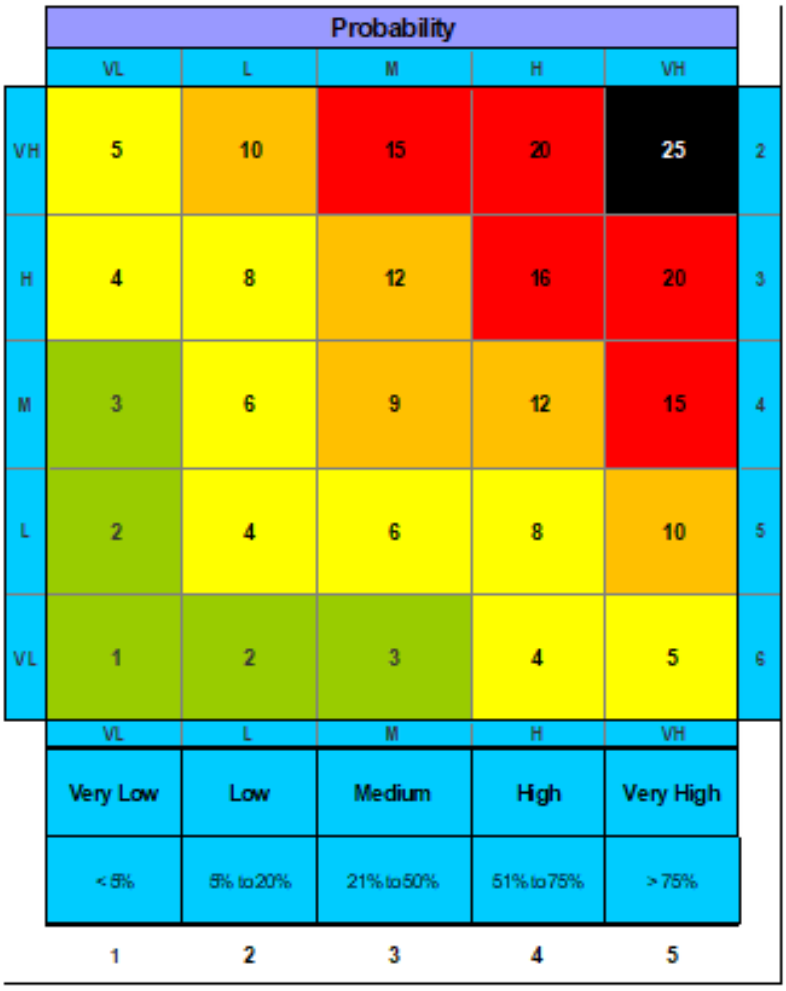
5.18.7. Following FBC, once an investment decision for the project(s) is taken and the scheme moves into construction and operation, governance will shift into the Shareholder Committee and HESCO Board. Additional relevant project monitoring and reporting will need to be put in place but this will be developed as part of the FBC.

Risk Management

5.18.8. The project team has maintained a risk register through the development of the OBC. Key risks and mitigations from the register are summarised below and presented at different stages of the project covering commercialisation (i.e. the next stage), construction and operation.

5.18.9. Presenting the risks by stage is intended to help the reader understand how the risk spectrum of the project evolves over time. Many key risks will be resolved progressively e.g. concerns over budget, consent and being able to get into contract with Energetik will be resolved during the next stage. However, it also shows that some ongoing risk will sit with the Council/HESCO during operation:

Table 5.18-9d - Risk scoring and classification



Description	Code Number	Scenario	Guide Probability
Very High (VH)	5	Almost certain to occur	>75%
High (H)	4	More likely to occur than not	51-75%
Medium (M)	3	Fairly likely to happen	26-50%
Low (L)	2	Low but not impossible	6-25%
Very Low (VL)	1	Extremely unlikely to happen	<5%

5.18.10. The following activities will be implemented to support ongoing management of risk on the project:

- Periodic review of the full risk register(s) during scheme development and delivery, to support early management and resolution. This will identify mitigation steps including

associated timelines and identify individuals responsible for ensuring the mitigation is put in place to allow progress to be effectively monitored.

- Key risks reported to project board on regular basis (as part of highlight reports)
  - Ensure that the action owners develop and implement their mitigation measures.
  - Review and update post-mitigation qualitative assessments.

5.19. Decisions Sought to Facilitate Next Stage of Work

5.19.1. The Cabinet report which accompanies this OBC includes a number of recommendations and decisions required to progress the projects to the next stage. They have not been duplicated here to avoid potential for inconsistencies.

List of Appendices

Title
A - What is District Energy?
B - Markets and Policy
C - Benefit Realisation Strategy
D - Summary of Plant Strategies
E - Tottenham Hale TEM Inputs
F - Wood Green TEM Inputs
G - The Council powers to deliver DENs
H - Subsidy Control
I - Legal considerations regarding pipelaying
J - Procurement advice (Legal)
K - Wood Green financial model assumptions
L - Tottenham Hale financial model assumptions
M - Wood Green sensitivity analysis
N- Tottenham Hale Sensitivity analysis
O - Appraisal of funding options
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Q - Planning Issues
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