

BEYOND LHEES:

The path to heat network delivery and learnings from UK projects

Speakers:

Tharina Conradie: Senior Consultant (Chair)

Jo Longdon: Commercial Director

John Maslen: Networks Business Manager (Scotland)

Peter Baynham: Head of Consulting



Ener-Vate offers a specialist, independent consultancy services to support the development and operation of low carbon district heat networks across the UK

Services range across:

- ♯ Feasibility Assessments
- ♯ Market Engagement
- ♯ Commercial Modelling and Structuring Options
- ♯ Investment Grade Reporting
- ♯ ESCo Asset Management (EAMS)

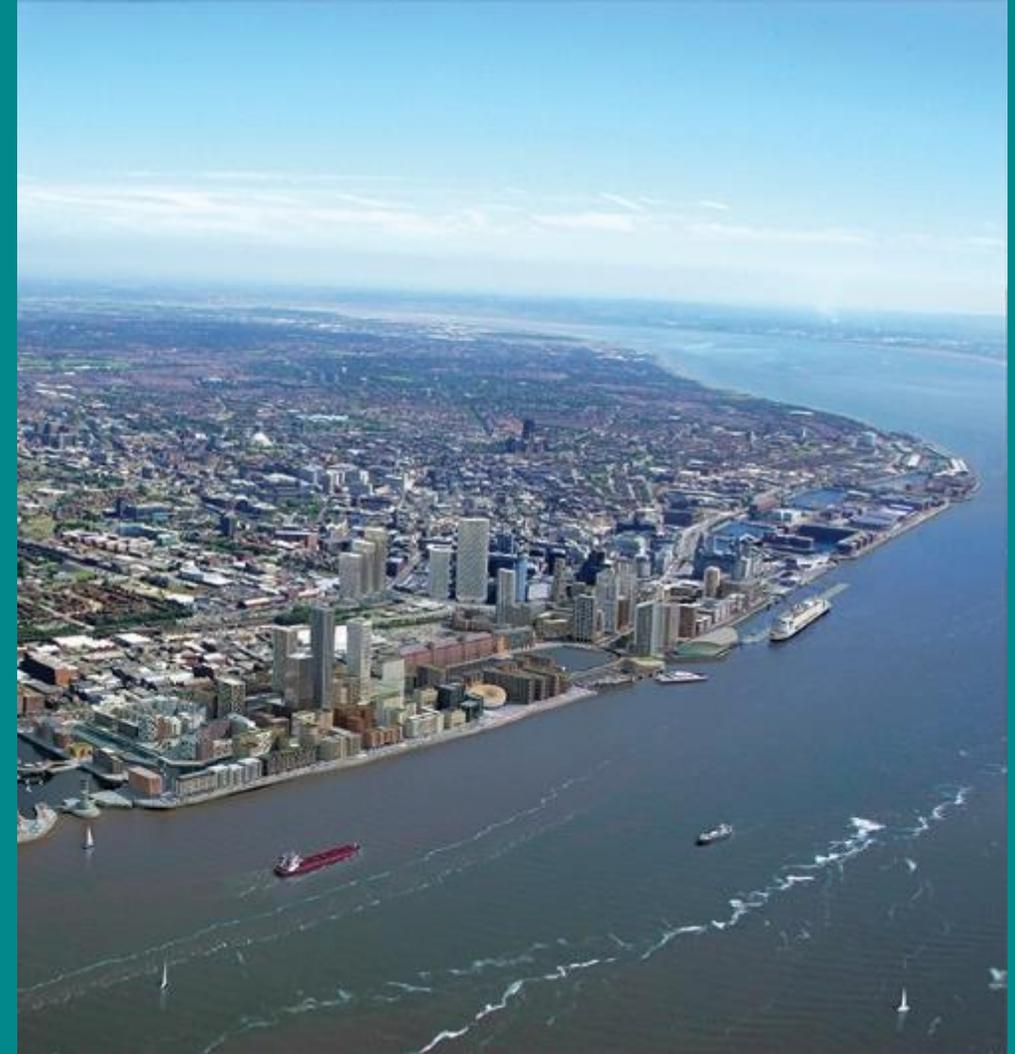
New Glasgow office to service clients in Scotland





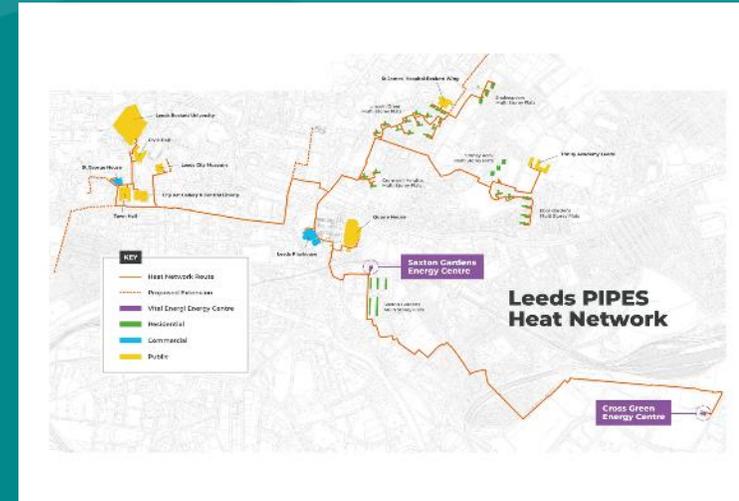
Mersey Heat

- Project currently 7 years in
- Part of Liverpool Waters - a 30-year vision to completely transform the city's northern docks, creating a high-quality, mixed-use waterfront based on historic docklands
- Phase 1 operational, constructing Phase 2
- Currently planning Phase 3 growth in line with emerging DESNZ zoning regulations
- Private sector led scheme by Peel Group - created a private ESCo – 'Mersey Heat'
- Ener-Vate helped Peel Group to:
 - Develop the scheme including securing HNIP and GHNF funding
 - Engage market to appoint a DBOM contractor
 - Support legal team on contract development for contractors and customers
 - On-going management of ESCo and securing new customers



Leeds PIPES

- Long history of HN ambition and key long-term senior champions that drove project
- Deliberate plan for Recycling and Energy Recovery Facility (RERF) plant located near city centre as low cost heat source
- LA created wholly owned ESCo: Leeds PIPES Ltd
- £60M investment by Leeds CC to address fuel poverty, carbon emissions and air quality
- Additional funding from W Yorkshire Combined Authority (WYCA), Leeds City Region Enterprise Partnership and ERDF
- Delivered project through DBOM contract with Vital Energi
- HN operational for 4 years: connects approx. 2,000 properties and numerous businesses
- Currently in expansion phase – adding customers.
- Ener-Vate have added capacity to LA as extension of in-house team, helped network to grow through attracting new customers



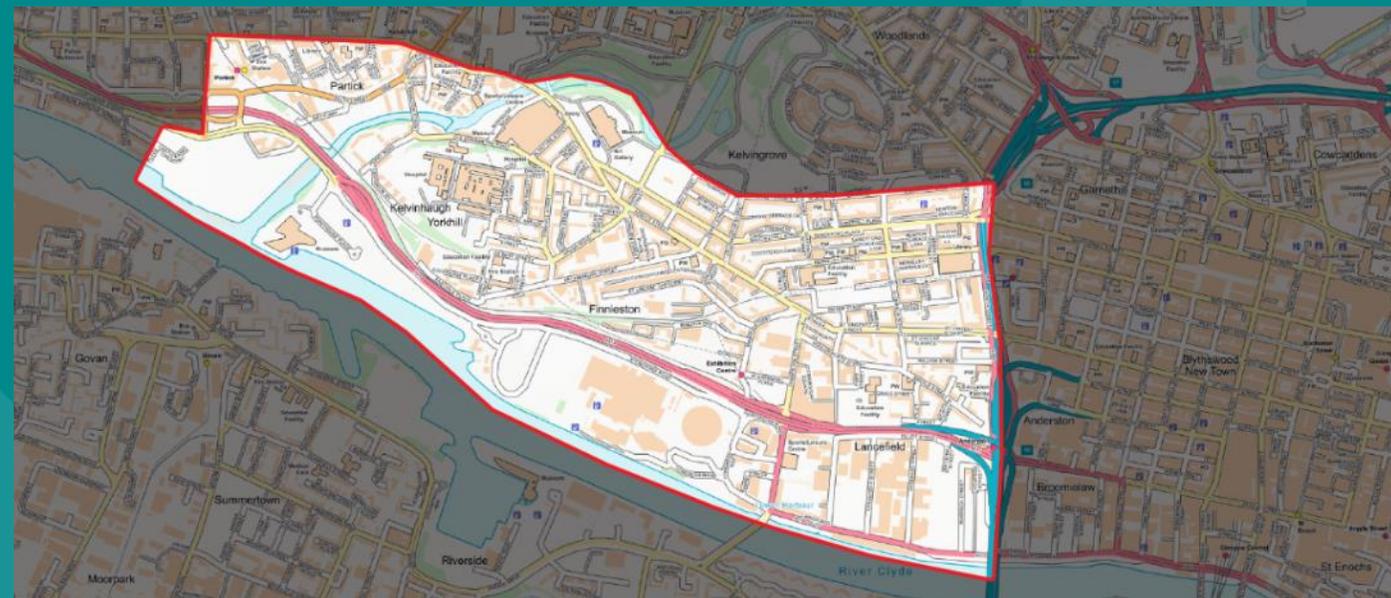
Manchester Heat Network

- Manchester City Council (MCC) took decision to create wholly owned arms-length trading ESCo: 'Manchester Heat Network TradeCo'
- Approx. £26M capital investment by MCC
- Received approx. £3M grant funding from HNIP
- Used "Carbon and Energy Fund" (CEF) Procurement Framework to procure a delivery partner to deliver the Civic Quarter Heat Network in July 2015
- Vital Energi appointed Dec 2018 to deliver the network under a Design, Build and Operate and Maintain (DBOM) contract
- Phase 1 completed in 2020 with 2km installed pipework and Energy Centre.
- Energy Centre located at Manchester Central Convention Complex incorporating combined heat and power (CHP) and boilers linking a 2km district heating network to Civic Quarter area.
- 7 public estate buildings currently connected, 22+ public and private sector customer connections in the pipeline.
- Ener-Vate added capacity to LA providing role as trusted commercial advisor and helping network to grow through attracting new customers



Clyde Heat

- Currently at Planning / Commercialisation stage
- Private sector led scheme by Peel Group
- Creation of a private ESCo – ‘Clyde Heat’
- Mix of new build/retrofit and public/private buildings as offtakers
- Taken 2-3 years to go through:
 - Masterplanning
 - Feasibility
 - Business Case
 - Commercialisation
- www.clydeheat.co.uk



Scotland Policy Context

Scotland / Holyrood



- **LHEES** - most are close to completion
- **HN regulation** through Heat Networks (Scotland) Act 2021. All HN developers will need consent to develop a project, a permit per zone and have a licence (as fit/proper operators) granting new powers (compulsory purchase, wayleaves etc.)
- **Heat in Buildings Standard** – currently open consultation (08/03/24) – aims to significantly increase number of HNs by granting ‘demand assurance’ powers to require existing buildings within designated HN Zones to end their use of polluting heating systems.
- **Secondary legislation for Heat in Buildings Bill phased in by 2025** – detail currently being worked up for consultation (considering requirements on public buildings, large commercial buildings, communally heated buildings and new buildings in HN zones).

[Heat networks - Renewable and low carbon energy \(www.gov.scot\)](http://www.gov.scot)

UK / Westminster



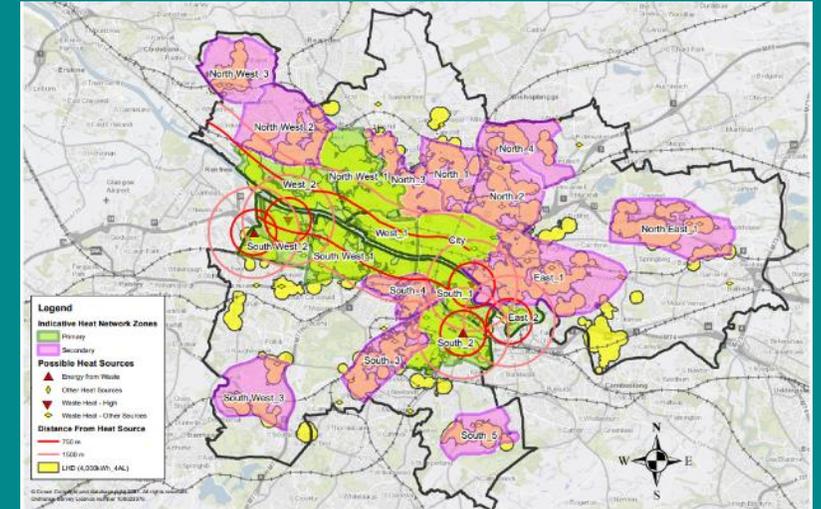
- **UK Energy Bill 2023** will impact Scotland significantly through regulatory protections for heat network consumers (e.g. pricing, quality of service, guaranteed performance standards, protections etc.) – to be managed by Ofgem.
- Procedures set for England are likely to impact on processes in Scotland:
 - **Heat Network Zoning Consultation** now open for England – highlights specific role of ‘Zone Coordinators’ (LAs) working with a ‘Central Authority’.
 - Potentially more significant role for Scot Gov as a ‘Central Authority’ (like DESNZ) to coordinate and fund zone-based HN development projects.

Strategy & Delivery Planning: Finalising Zones

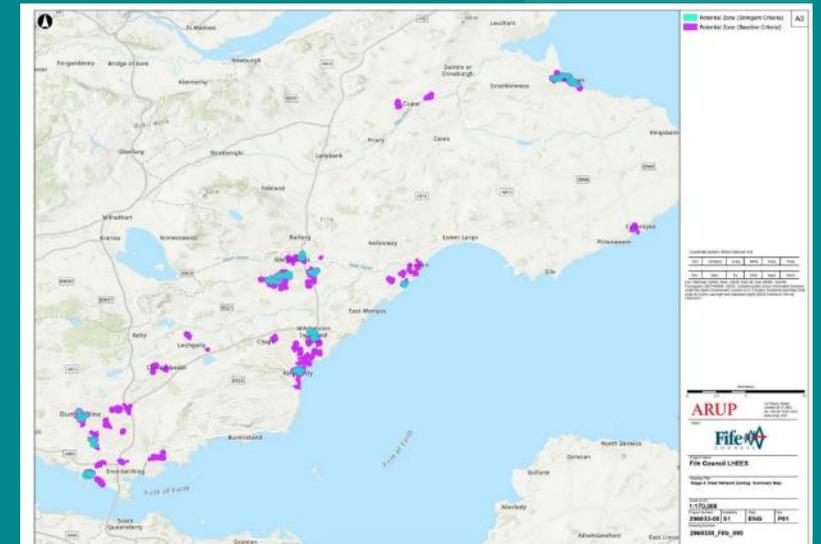
- Before designation, refinement of zone boundaries by Zone Coordinator based on local knowledge
- Should zones be classified (primary/secondary)?
- Should they be grouped into portfolios or considered independently?

“There is limited appetite among major investors for sub-scale, overly complex or piecemeal transactions” (First Minister Investor Panel)

- Consideration of incumbent HN operators inc. those that are substantively commercialized but not operational yet
- Stakeholder engagement around HN zones
- Final refinement of HN zone boundaries
- Designation of zones by a Central Authority and/or Zone Coordinator



Potential HN Zones: Glasgow LHEES



Indicative HN Zones: Fife LHEES

Strategy & Delivery Planning: How could we deliver LHEES?

Undertake Options Appraisal of Delivery Models

- May include governance options for organisation and/or partnership (see Fife example right)
- Series of structured workshops with officers, senior management, local politicians and external stakeholders
- Includes awareness raising and optioneering inc. scoring against standard criteria

In parallel..

- Review experience of others inc. neighbours, particularly those a bit further along the road
- Visioning exercise - agree 10 year vision for high priority HN zones
- Clarify commercial opportunity – undertake techno-economic feasibility study for priority zones individually and as portfolio – this would benefit from nationally agreed method, standard parameters and use of specific software tools (see Heat Vision 2030 as large-scale example)

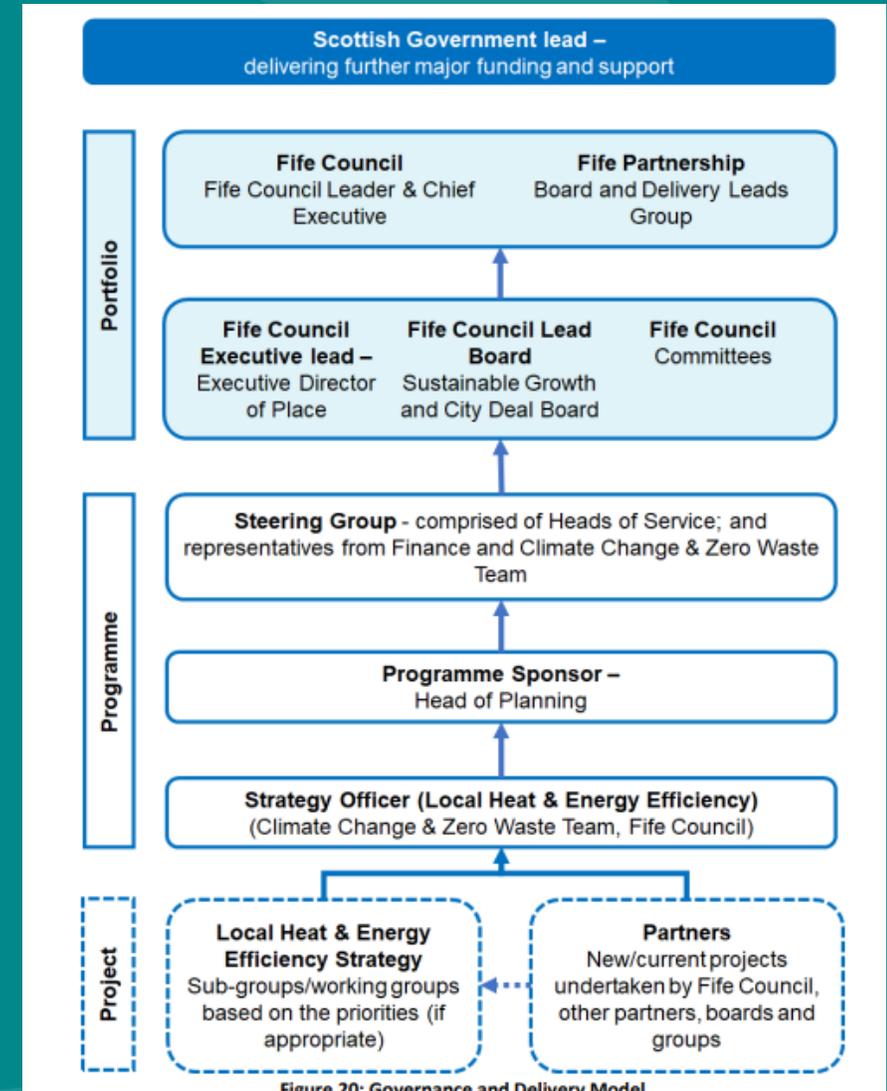


Figure 20: Governance and Delivery Model

Strategy & Delivery Planning: Key questions

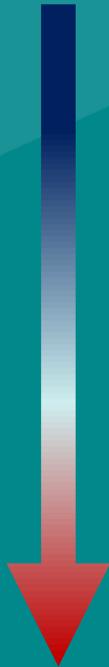
- Organisational fit – do we want to be a regulated local heat supplier?
- Political fit – what role do we have political support for?
- Key objectives – what do we want to achieve? Do we prioritise fuel poverty over building decarbonisation?
- Funding and finance – how do we finance this? Can we afford this?
- Value – what is potential value of project portfolio as direct revenue stream plus wider benefits? Does it offer value for money?
- Deliverability – is our project portfolio viable and investable? Are all Delivery Models open to us?
- Risk - Reward – what is our risk-reward appetite? what are the major risks and who takes them?
- Control - how much control do we want over factors like contracts, future expansion, customer tariffs?
- Exit – what are our exit options?
- Scale, type and phasing – what is scale of our ambition? What types of projects do we want? What do phases look like?
- Stakeholders – who are they and what are their roles? What route are our neighbours going down and is there value in consistency?
- Governance – what is the best structure for decision-making and delivery? Who are our 'champions'?
- Capacity - do we have capacity and expertise? Can we fill gaps?
- Engagement – can we secure community support for this?



Strategy & Delivery Planning: Delivery models

Agree delivery model

PRIVATE
Low risk
Low reward
Low control



PUBLIC
High risk
High reward
High control

Delivery Structure	Description
OPTION 1 3rd Party Developer ESCo	Project Sponsor (LA) appoints a third-party developer to deliver the HN through an ESCo. Examples are limited at this time
OPTION 2 Concession	Project Sponsor (LA) enters into a concession agreement with a third-party ESCo to grant them rights to develop and operate a HN for time-limited or indefinite period e.g. Edinburgh Granton Waterfront
OPTION 3 Joint Venture ESCo	Project Sponsor (LA) procures a Joint Venture 'energy' Partner and establishes a joint ESCo based on a shareholder agreement to deliver a portfolio of HN projects e.g. Midlothian C + Vattenfall = Midlothian Energy
OPTION 4 LA-led ESCo	Project Sponsor (LA) establishes a wholly owned ESCo to deliver the HN e.g. not-for-profit Aberdeen Heat & Power, Leeds PIPES, Manchester
OPTION 5 In-House LA Delivery	Project Sponsor (LA) develops the HN internally without establishing a stand-alone delivery vehicle e.g. West Dunbartonshire Council

Strategic and Commercial Case report – lots of examples of different structures in operation

Shetland Heat Energy & Power (SHEAP) – Lerwick DHN, owned by a charitable trust, operated by SHEaP Ltd, capital from oil funds, profits reinvested in social value in community

Strategy & Delivery Planning: Stakeholders & roles

There are lots of potential parties to involve and lots of roles to fill:

Potential stakeholders

- Local Authorities
- Local politicians
- NHS Trust
- Higher Education
- Emergency Services
- RSLs
- Local partnerships
- Regional partnerships
- Central Gov / Agencies
- Scottish Water
- SGN
- DNO (SPEN, SSEN)
- Major heat suppliers
- Private sector groups e.g. Chamber of Commerce
- Voluntary sector groups
- Community groups

Parties/Structures

- Local Authority (LA)
- Developer
- Energy Services Company (ESCo): a company that supplies and sells energy to customers.
- Estate Management Company (ManCo): a body established by a landlord or a property's joint owners to manage and maintain that property.
- Transmission Company (TransCo): a subtype of ESCo which supplies energy on a bulk purchase, or wholesale, basis only.
- Community Body
- Joint Venture (JV)
- Special Purpose Vehicle (SPV)
- Customer: includes tenants, leaseholders, owner-occupiers and business customers
- Funder
- Contractor: includes Design and Build (D&B), Operation and Maintenance (O&M) and DBOM.

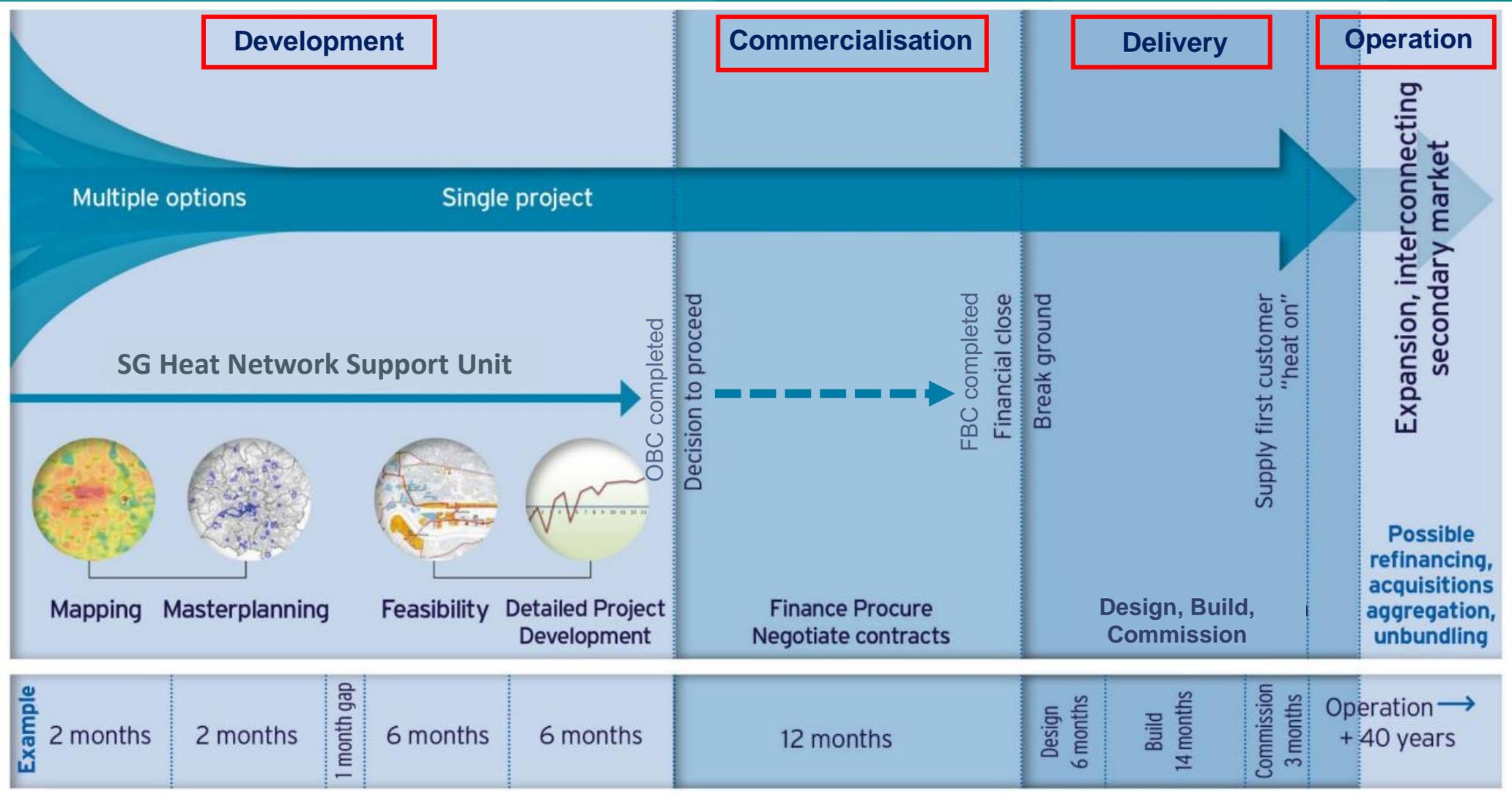
Roles

The main roles that need to be undertaken during the delivery of any heat network are:

1. Promotion
2. Customer
3. Governance
4. Regulation
5. Funding
6. Asset Ownership
7. Development of Property
8. Land Ownership
9. Landlordship
10. Installation
11. Operation
12. Sale of heat
13. Supplier of last resort

Delivering HNs: the project journey

**Strategy and Delivery Planning
(LHEES + Delivery)**



(1) Project-specific energy masterplanning

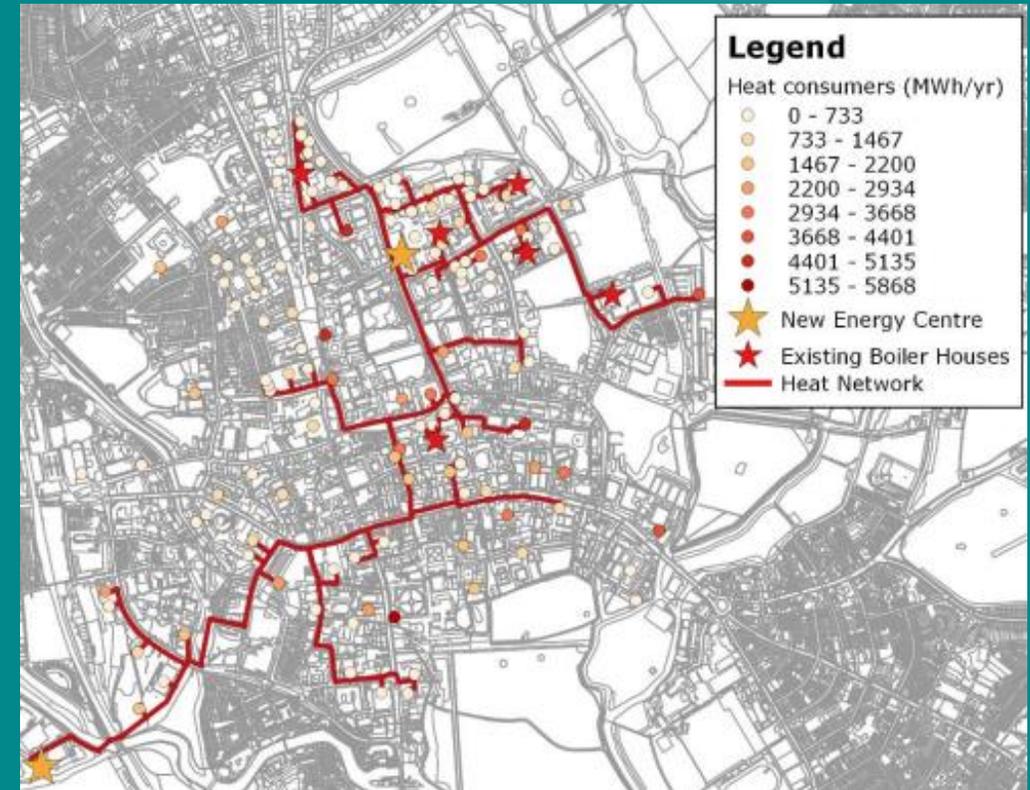
- May be minimal if done through LHEES
- Collate optimal data sources at local scale
- Fill data gaps
- Identify areas with highest heat density
- Identify key offtakers
- Identify heat supply options
- Identify electricity substations and capacity
- Review key constraint data – heritage, archaeology, drainage, major physical constraints (large roads, rivers, rail lines)



(2) Feasibility: Commercial & Technical

Undertake feasibility studies per project for a short-list of potential opportunities:

- Investigate techno-economic options
- Review key stakeholders
- Assess potential anchor loads, other offtakers and viable route connectivity options
- Identify viable heat supply options
- Analyse financial viability
- Review risks and mitigations
- Short-list options based on viability
- Propose potential development programme



(3) Detailed Project Development (DPD):

Outline Business Case (OBC)

This assesses project against Five Case Model in accordance with HMT's Green Book to review viability from 5 perspectives:

- Strategic – assessment against national and local policy objectives, critical success factors for project
- Economic – comparison against BAU inc. social cost savings of emissions reductions, social NPV and Gross Value Added to local area
- Commercial – delivery model options, roles / parties, early discussions with supply chain, contractual arrangements, risks and mitigations, heat pricing strategy, procurement strategy, exit strategy, 'preferred option vs do nothing'
- Financial – migrate techno-economic model into investment grade financial model, heat pricing, sources of funding, raising investment capital, revenue streams, cashflows, approval by Investment Review Board
- Management – governance structure (e.g. Project Board) for decision-making within council, stakeholder engagement



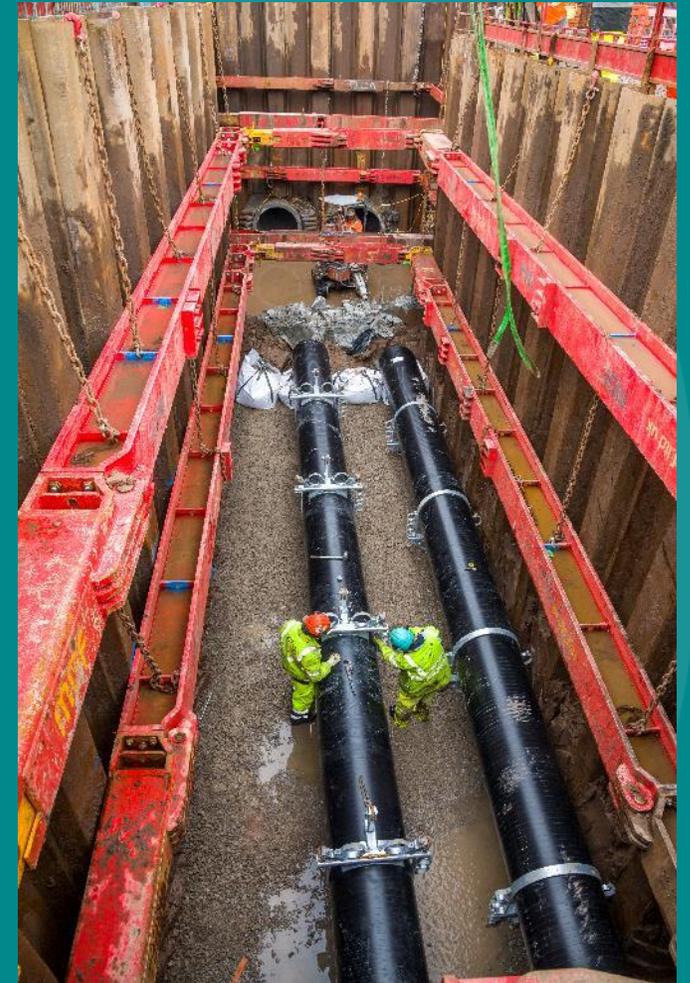
(4) Commercialisation: Contracts & Procurement

- ⌘ Detailed engagement with heat generators
- ⌘ Detailed land reviews to identify energy centre location options
- ⌘ Detailed engagement with high priority offtakers
- ⌘ Permissions / consents sought by planning / environmental bodies
- ⌘ Utility connections secured for energy centre
- ⌘ Investment grade financial model developed
- ⌘ Permit details translated for planning purposes
- ⌘ Procure delivery partner (DBOM?) depending on delivery model – update financial model with actual pricing to create Final Business Case (FBC)
- ⌘ Detailed RIBA 3 design produced + liaison with local authority planners
- ⌘ Approval of FBC and agreement to proceed to Delivery



(5) Delivery: Design, Construction, Commissioning

- ⌘ Develop and finalise detailed design inc. integration with all key Phase 1 off-takers
- ⌘ Finalise utility connections
- ⌘ Ensure all planning conditions completed
- ⌘ Finalise all licencing and permitting with associated agencies e.g. SEPA
- ⌘ Conclude all easements and wayleaves
- ⌘ Construction of network to specification ensuring all requirements meet key drivers i.e. fuel poverty
- ⌘ Test and commission system and ensure it meets national regulations



(6) Operation & Maintenance

- ⌘ Ensure customer-facing processes operating effectively and customers have knowledge and quality service
- ⌘ If out-sourced then ongoing contract management of ESCo to ensure performance and programme being met and regulations adhered to
- ⌘ Manage customer relationships, ensure effective metering & billing arrangements
- ⌘ Future growth phases – how do you want to grow your network? Where are your next customers?



Summary of key learnings

1. HNs are technically and commercially challenging large scale infrastructure projects with 40+ year operating terms – 3rd parties acting in best interest of LAs can fill capacity gaps and support knowledge transfer to internal staff.
2. LAs bring significant value to table – permitting, planning, landowner, asset owner, access to customers, access to funding and low cost finance, dilute overtly commercial perception.
3. Your commercial model underpins most decisions – revise it regularly - most projects borrow capital so projects need to be investable - talk to investors re. their lending criteria.
4. If you are considering being a local, regulated utility supplier (inc. JV partner) fully appreciate the opportunities – avoid jumping in with limited knowledge - engage with early adopters, undertake risk analysis, talk to other LAs etc. ‘Fast follower’ position could be lower risk and still offer funding.
5. Where 3rd parties are involved (eg JV) fully understand their commercial position – what is the long-term value to you?
6. Prioritise your key project drivers - e.g. net zero buildings, fuel poverty, air quality, financial returns, meet climate targets?
7. Monitor policy and regulation updates closely – key drivers.
8. Adopt standards as they emerge in delivery models, technical standards (e.g. CIBSE CP1), legal contracts etc.
9. Effective stakeholder engagement at all stages is critical
10. Be realistic about timescales: development journey 4-7+ years



Contact:

**John Maslen, Network Business Manager
(Scotland)**

Email: johnm@ener-vate.co.uk

**Subscribe to 'Connect', our Ener-Vate
quarterly newsletter for up-to-date
information on the market and legislation.
www.ener-vate.co.uk**

Useful links:

1. [Home - Heat Network Support Unit](#)
2. [Workshops on Heat Networks - Heat Network Support Unit](#)
3. [https://assets.publishing.service.gov.uk/media/5b2a1f03e5274a18e8bf52bb/Strategic and Commercial Case development.pdf](https://assets.publishing.service.gov.uk/media/5b2a1f03e5274a18e8bf52bb/Strategic_and_Commercial_Case_development.pdf)

