

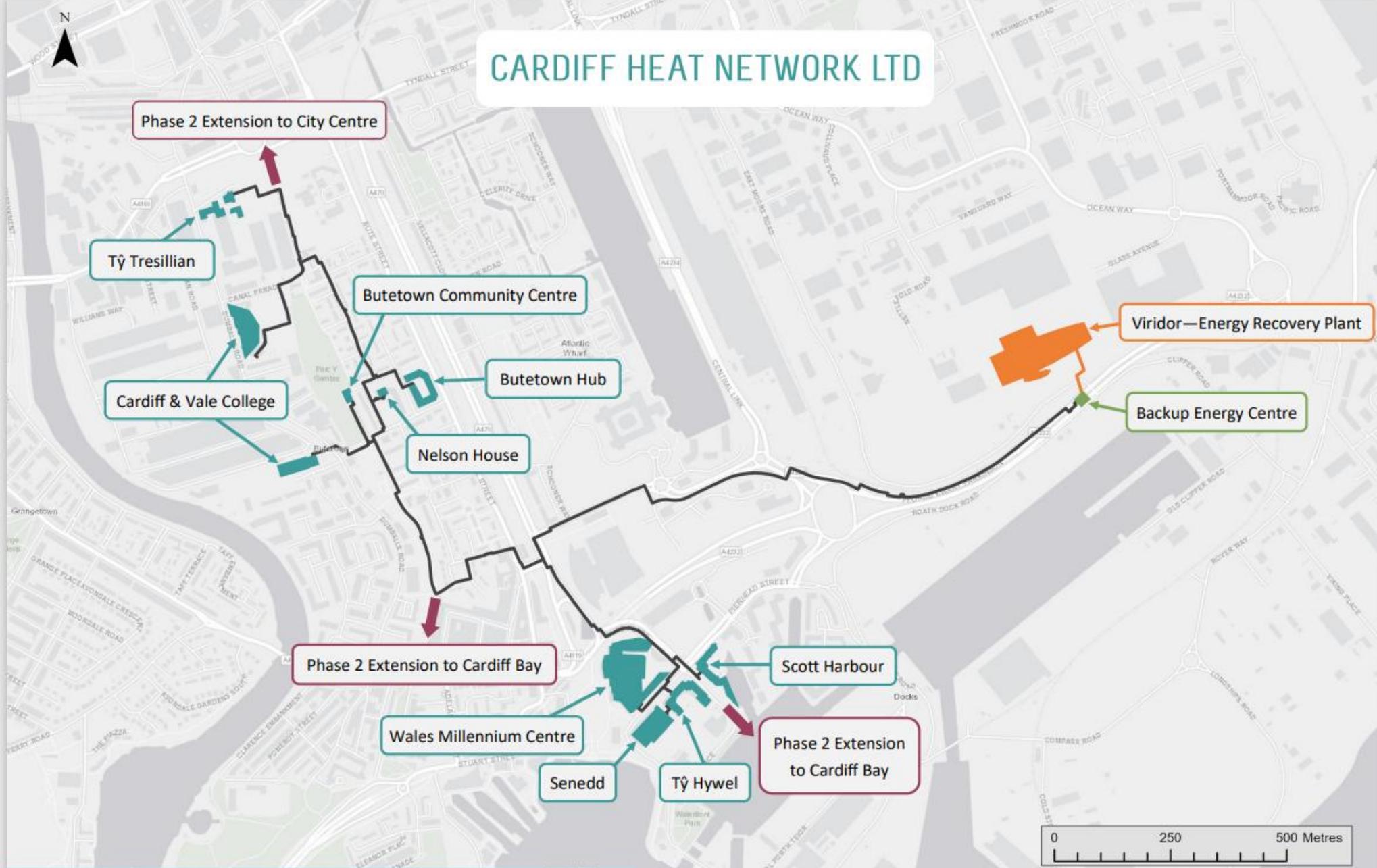


Gareth Harcombe
Managing Director CHN Ltd
Head of the Climate Emergency Response





CARDIFF HEAT NETWORK LTD



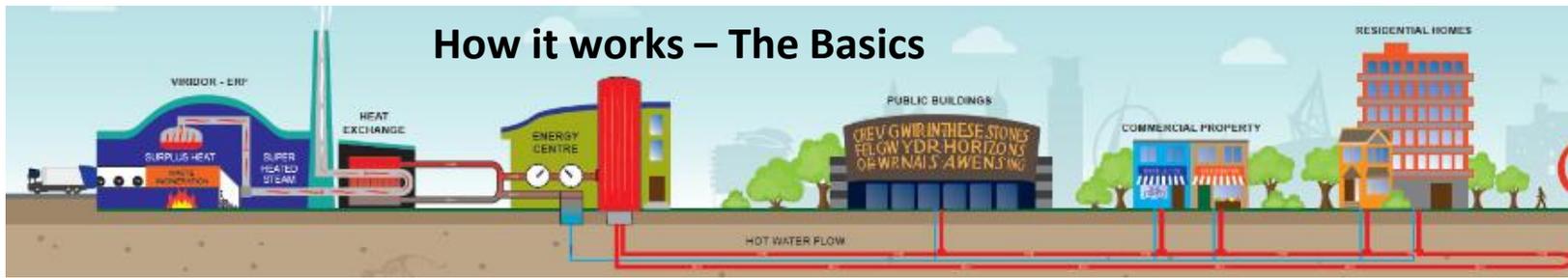
- Basics
- Project History
- Business Case
- Project Sign-off
- Horror Stories
- Customer Journey
- Next Steps for CHN
- Lessons Learned



Sustainable ENERGY

HEMIKO

How it works – The Basics



Heat Source – Energy From Waste Plant

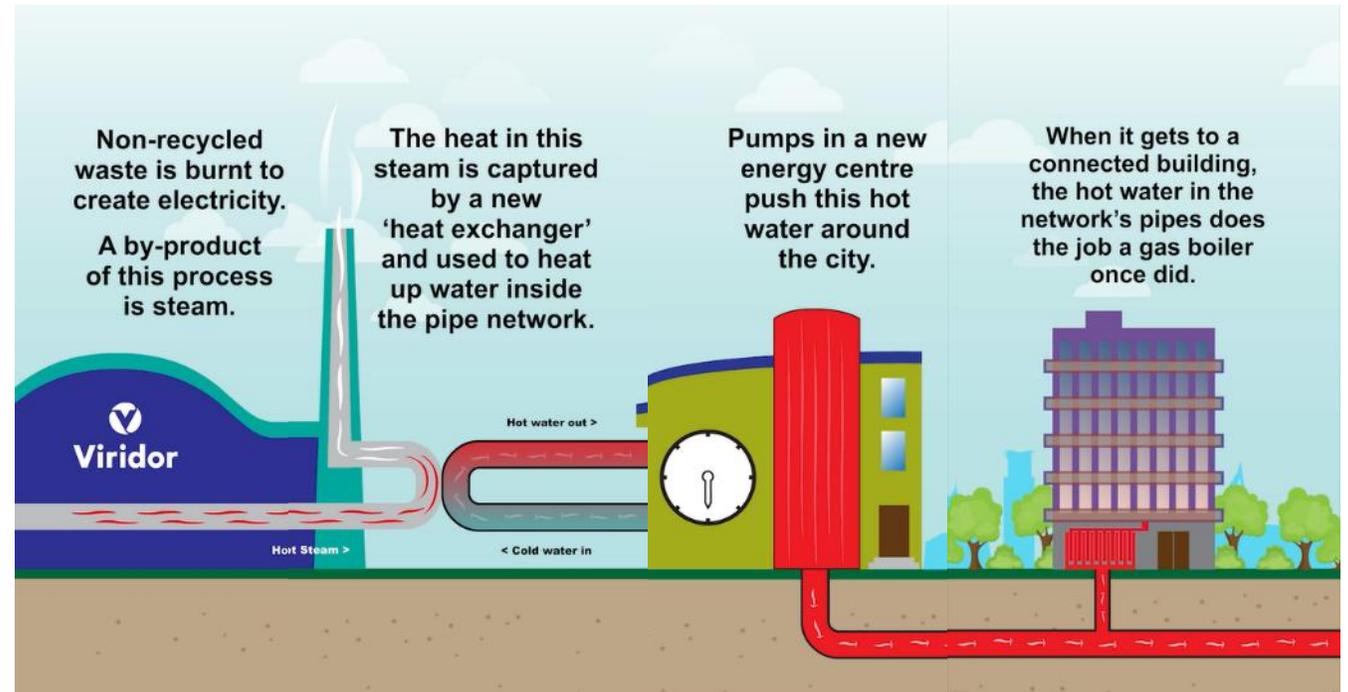
- Electricity generated from waste incineration is NOT low carbon
- But steam produced as a by-product, and at low pressure IS
- Captures an otherwise unused resource
- Maximises the environmental efficiency of the plant
- 15 MW of heat available 24/7

Back-Up Energy Centre

- Thermal Stores - to optimise and cope with peak demand
- Pumps to distribute and maintain pressure
- Gas Boilers – just in case and to guarantee continuity of heat
- Water temperature 90°C

Customer Buildings

- Another Heat Exchanger replaces gas boiler in the plant room
- Also a segregated system
- Feeds internal CH arrangements and BMS with minimal/no change needed



80% carbon reduction compared to Gas
60% compared to Air Source Heat Pumps

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Project History – Heat Source



Prosiect Gwyrdd

Technology neutral solution post landfill

Collaborative procurement in SE Wales region (2008/9)

Viridor EFW winner

Planning Consent - June 2010

2nd Attempt/Controversial/Judicial Review

Consent for “Combined Heat & Power Plant”

NRW Licence - requirement to report on HN actions

But no specific Planning Condition for a Heat Network connection

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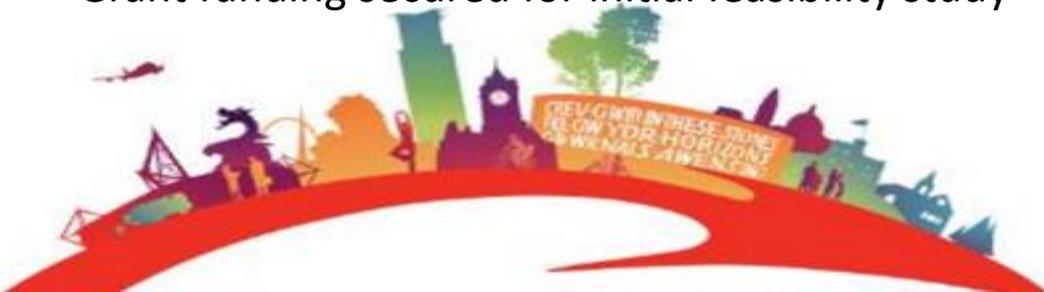


Project History – Heat Network



- EfW Construction 2012-2015
- Initial Approach from EfW and Energy Company Delivery Partnership
 - Requested Council and other local public sector organisations to commit to being anchor customers to a Heat Network
- Customers Due Diligence (counsel opinion)
 - Procurement opinion
 - Collective/partnership customer ambition – to steer better negotiation and outcomes
 - Loose collective formed and agreed to consider a formal offer
- No progress for 2 years - Eventual break-up of private delivery partnership
- First CCC discussions with Government about potential for a Public Sector led project
- Grant funding secured for initial feasibility study – delivered a positive outcome with some political support

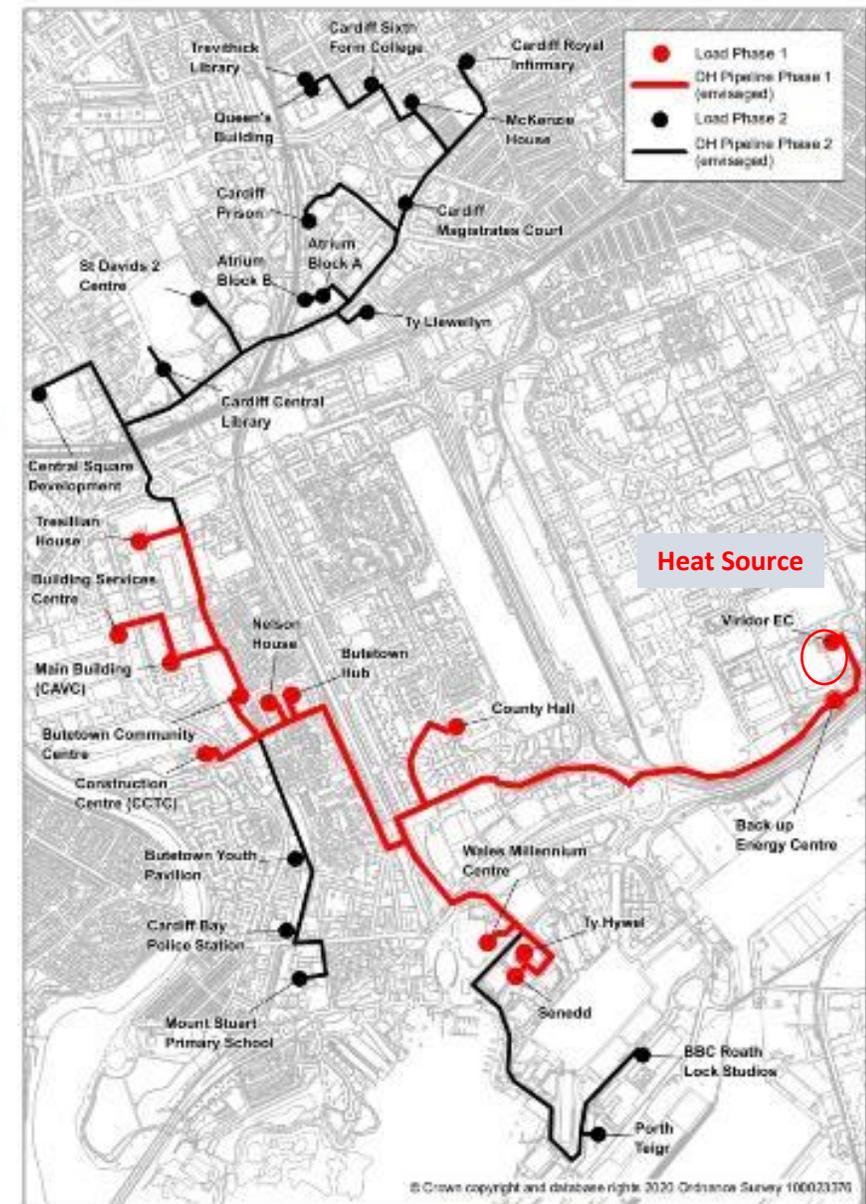
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Outline Business Case Development

HNDU Funded

- Carbon Trust brought in to advise and steer – Jonathan Williams
- WSP
 - City wide masterplan – 4-5 potential sites
 - Viridor option identified as most viable
 - Heat customer cluster analysis
 - Outline route developed
 - Initial costs and potential returns
- Initial engagement with anchor customers and Viridor
 - All customers in the public sector
 - Long term presence, and patient
 - Decarbonisation ambitions and commitments
 - Enough interested “anchor customers” to manage risk
- Outline Business Case approved by Cabinet - 2018
 - instruction to develop Full Business Case



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Final Business Case Development

HNDU Funded (with some Council match funding)

- Carbon trust retained to advise and steer – Jonathan Williams
- SEL engaged to develop detailed technical specification and standards
- Browne Jacobson and WBD engaged on legals with Bevan Brittan later
 - Company structure, Governance and Articles of Association
 - DBOM contract drafting
 - Customer contract templates
 - Viridor Heat Purchase contract drafting
 - Easements etc
- Woodward Energy Consulting – Techno Economic Model



Bevan Brittan 



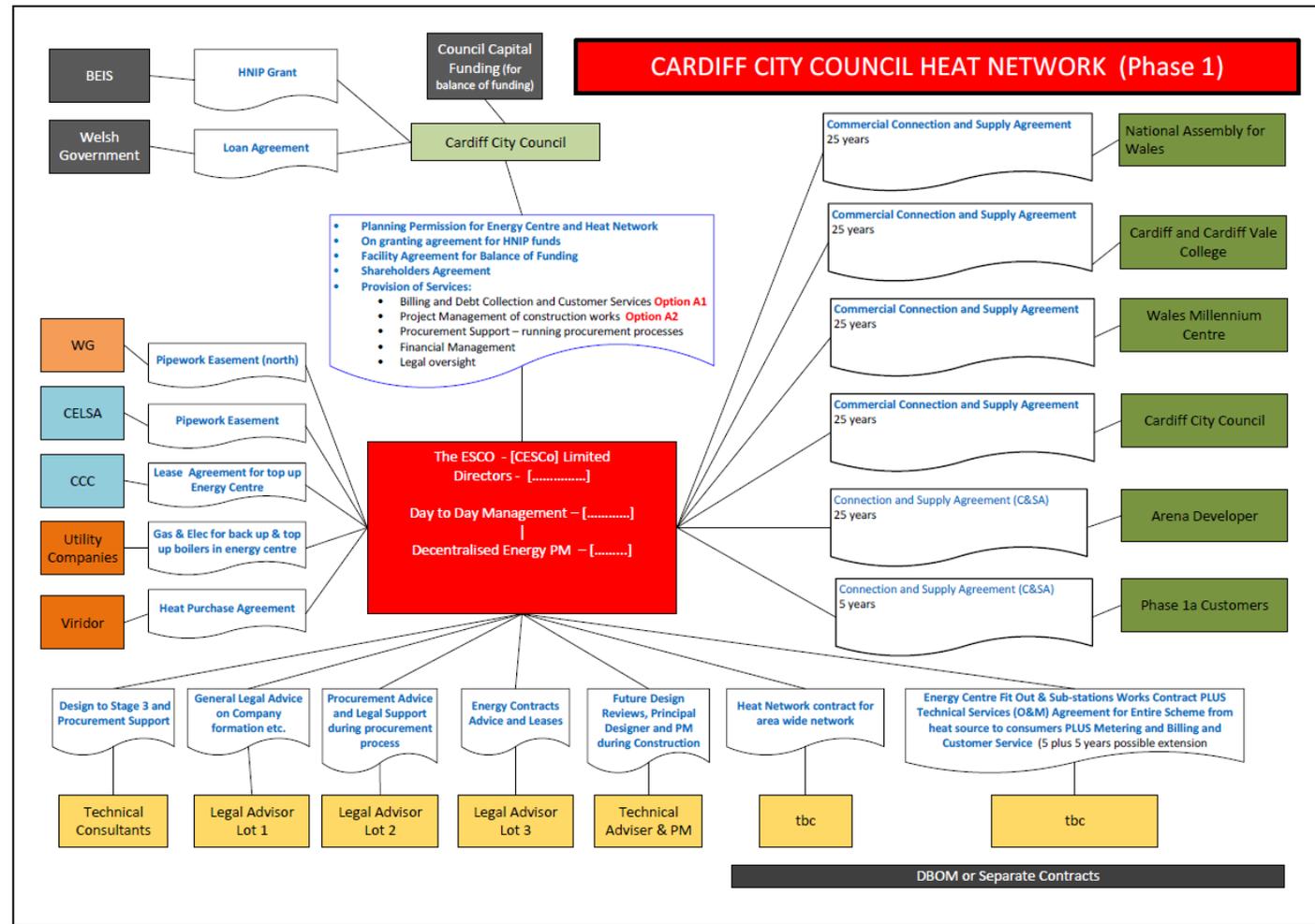
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Final Business Case Development

Resulted in:

- Signed Customer MoU's
 - all "public sector" with decarb ambitions
 - Viridor - Summary of Commercial Arrangements
 - Techno-economic model showing feasibility
 - Design specification
 - DBOM contract drafted
 - Tender documentation (with soft market testing)
-
- **HNIP Grant Application**
 - **WG Loan Negotiations**
-
- Both successful in principle
-
- 1st Cabinet Report – approved the principles and authorised procurement



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Final Business Case Development

OJEU Tender launched

- Fixed price approach
- Design Build and then Operate and Maintain (DBOM) for 5 years (option to extend for + 5)
- Strict quality assurance and sign-off processes in-built

- Final Prices returned to Cabinet – 2nd report – Dec 2020
 - Decision to proceed (within affordability envelope)
 - Decision to accept grant and loan
 - Decision to incorporate company – with CCC as sole shareholder
 - Approved Articles of Association and Shareholders Agreement
 - Appointed Board Members
 - Decision to On-Grant and On-Lend to the company

- Pinnacle Power appointed and contracted (later renamed Hemiko)

- SEL appointed as Contract Manager and Principal Designer
- Woodward Energy Consulting appointed as Commercial Advisor
 - Ensuring continuity and “project memory” for contract implementation phase

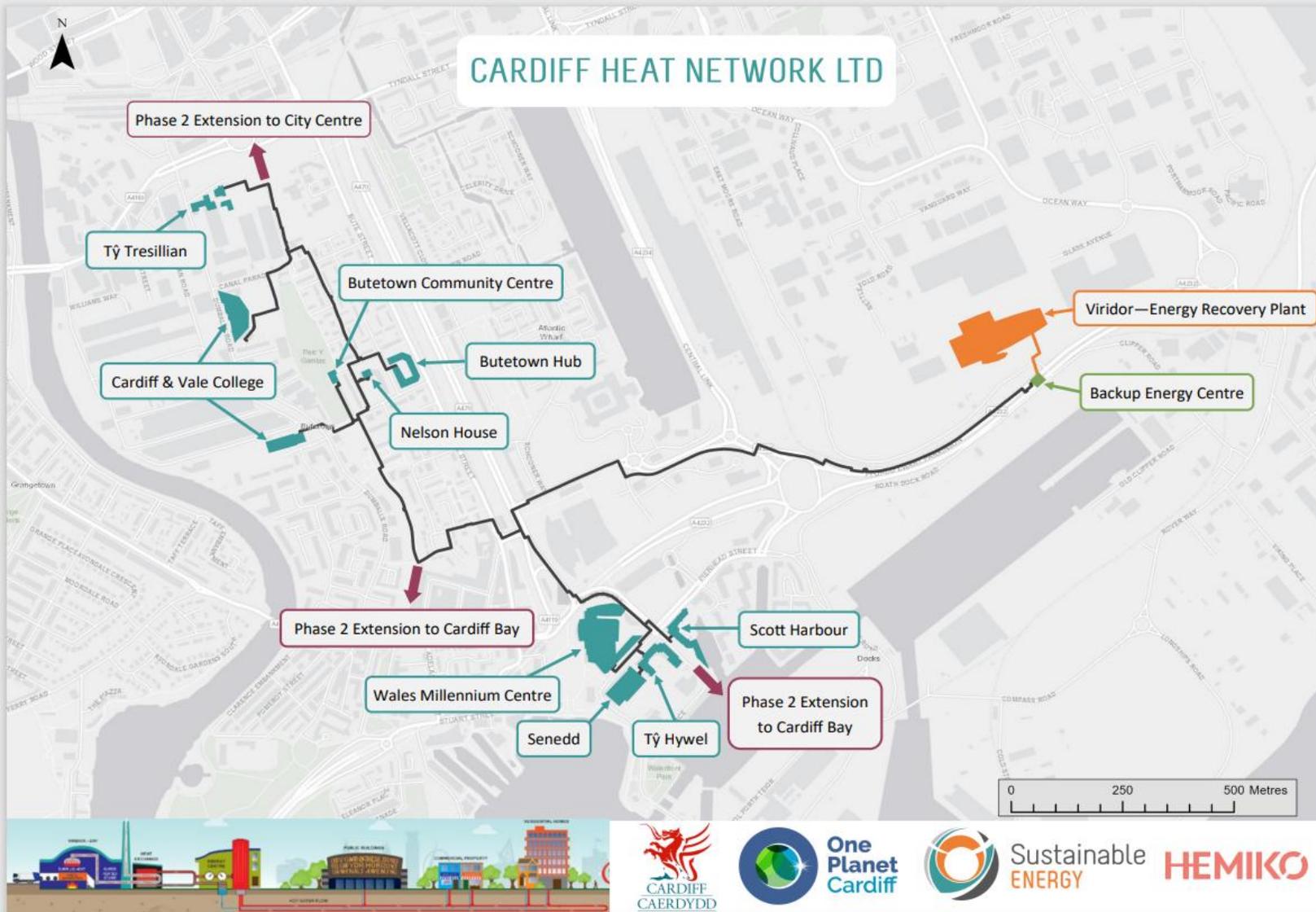


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Construction started Early 2022

First Customer Connection Nov 2025

Practical Completion March 2026

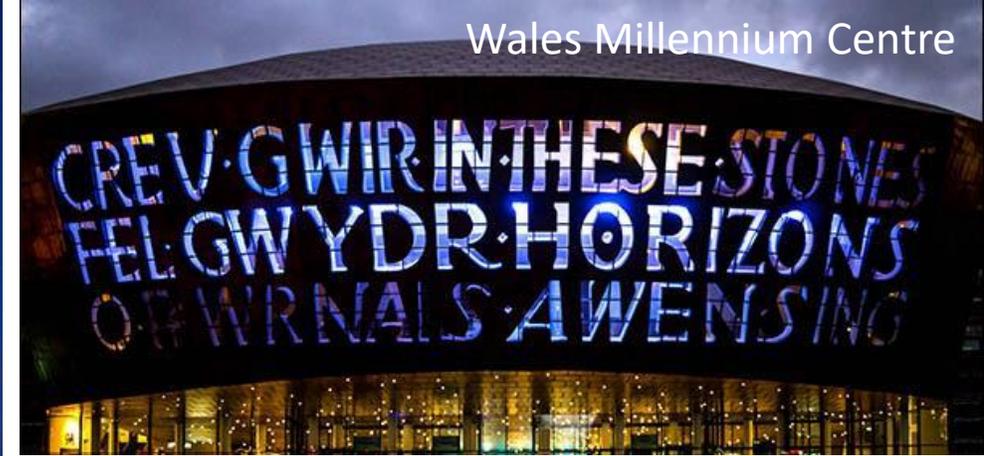


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Collectively take about 10% of the EFW Heat availability



Senedd



Wales Millennium Centre



Nelson House



Butetown Community Ctr



Tresillian House



CAVC Construction Centre



Cardiff and Vale College - Main Building



Scott Harbour Residential



Ty Hywel

HORROR STORIES

- **Heat Source**– 2022 withdrew support
 - Brought around with legal arguments
- **Major customer withdrawal** – due to a redevelopment decision
 - Letter of comfort from Council
- **Hemiko** – restructuring and supply chain delays
 - All good now
- **Third Party Easements** - Significant “ransom strip” issues
 - CCC led detailed and complex negotiations to resolve
- **Heat Source** – valve installation failure
 - Redesign and significant delay waiting for next planned outage
- **Cashflow and expansion funding** – no GHNf access in Wales
 - Several potential new customers lost
- **Interface with other major projects** – timing and potential to sever expansion hopes



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Customer Journey: Scott Harbour Case Study

Background

- Major developer conversion of offices to 70 residential flats
- CHN Ltd was approached early in the process for a quote to connect
 - Up-front connection charge
 - Likely “variable” charge for heat consumption
 - Fixed charge for servicing, repair and “continuity” guarantees
- Developer compared this with alternative heating options (Gas/Air Source)
- Early discussions inconclusive
- Cardiff Council Housing team became interested and started commercial negotiations to acquire – with a drive for better carbon/energy performance
- Connection Agreement secured with Developer linked to a land deal with Housing



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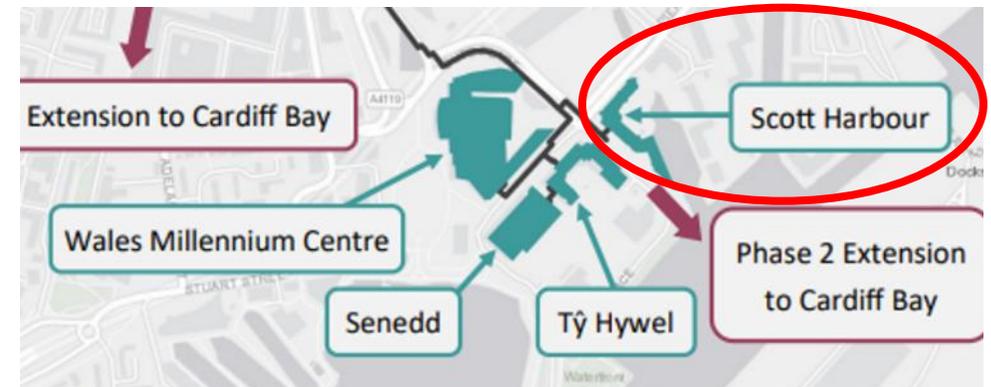
Customer Journey: Scott Harbour Case Study



ISSUES for CHN Ltd

Developer Negotiations

- Planning and Building Regs policy supportive-ish, but far from definitive – the “carbon” case remains secondary to “viability”
- CHN not sighted on developers “Counterfactual Costs” for alternative heat solutions
- Definitive “offer” needed to be made in advance of works instruction
- First Occupation of flats, and so first heat demand, would be in advance of full connection works
- Developer not concerned with ongoing fixed and variable charges – legacy for third party
- Fixed Charge Element – an ongoing annual customer cost - Traditional “Gas” solutions tend to be reactive
- OFGEM Heat Network Regulations emerging at the same time



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Customer Journey: Scott Harbour Case Study



OUTCOMES

- A successful and stable connection – even before the link to the network was complete
- Net Zero Ready housing achieved at a highly competitive cost
- Significantly reduced pressure on the electricity grid
- Resilience and “continuity of heat” guaranteed

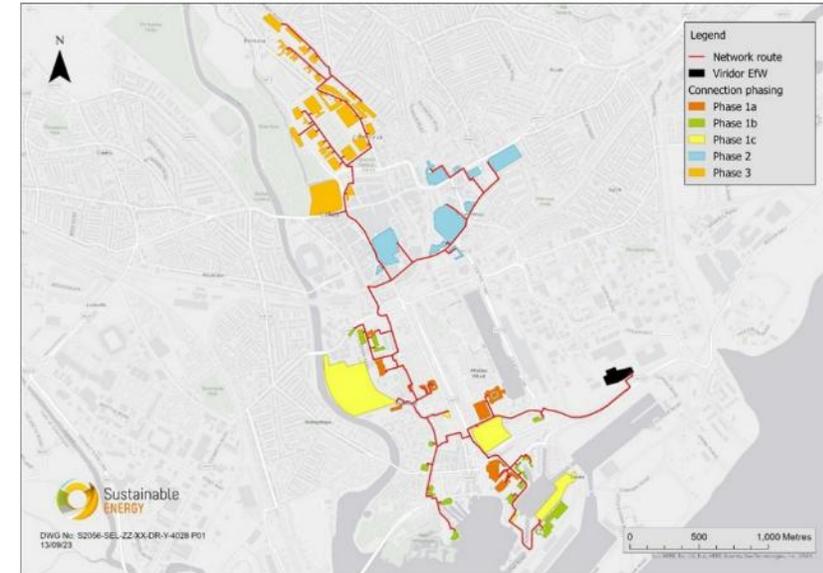


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Next Steps for Cardiff Heat Network

- Practical completion and transfer to Operate and Maintain phase – March 26
- Consolidate Phase 1 and market to neighbouring properties
- Tackle first phase extension to City Centre – HNIP grant ☺
- Feasibility for connection to Historic Civic Centre – HNDU Grant ☺
- Feasibility of renewable gas connection at Energy Centre – W&WU
- Build Expansion Business Cases – for funding applications
- Develop longer term additional heat sources
- **Work with Welsh Government to understand and address funding issues!**



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Lessons Learned

- It's a LONG process! – choose patient partners and build in continuity and project memory
- Develop a great contract with strong contract management devices
- Our position as a not-for-profit Council organisation with political links has been vital
- Proving the low-carbon/low-cost case is essential for customer engagement
- The “counterfactual and whole-of-life cost model” needs better promotion and to be more central to policy
- The potential reduction of pressure on the grid needs better promotion and to be more central to policy
- Hard to see how the Private Sector led approach could have succeeded in retrospect
- We'd have been here much sooner with stronger obligations on, and expectations of heat sources
- We need better alignment with Planning Policy and Building Regs – not just Zoning
- Wales deserves a confirmed policy and funding position



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But...

Phase one is operational and soon to complete
Paves the way to substantial growth and decarb
Major expansion discussions in progress
Significant interest from new customers, Govt and other Cities
Proves the case and, hopefully, helps policy discussions

Will endure for decades,
with added low carbon heat sources to come



Martin Mc Cluskey
Minister for Energy Consumers



Jo Stevens
Secretary of State for Wales

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THANKS



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