Ellesmere Port Heat Network

Invest Net Zero Cheshire

IKIGAI ea technology CATAPULT Energy Systems Cheshire and Warrington 87 Local Enterprise Partnership Cheshire energy hub

Project reference number: 017

Project type: The development and construction of an industrial heat network serving, as first phase, anchor demand from Thornton Science Park and tenants at nearby Protos Park with potential for expansion to the surrounding Ellesmere Port area.

Project maturity: Early feasibility (high-level heat mapping exercise) which has identified potential heat sources for phase 1 of a network pending completion of a more detailed demand mapping exercise underway at Protos Park.

Key strategic drivers: Decarbonisation of heat, monetisation of waste heat

Locations:

- Initial anchor demand: Thornton Science Park, Pool Ln, Chester CH2 4NU and tenants at Protos Park, Grinsome Road, Chester CH2 4RB
- Initial supply: existing generation and waste heat supply locations being evaluated but including Ince Biomass Power and industry at and surrounding Protos Park.

Proposed phases: The phasing of the development of the network is expected to align with developments at Protos Park and Thornton Science Park with expansion being contingent on identifying other large scale heat users further afield.

Total estimated carbon savings p.a.: 2,380 to 23,092 tonnes CO_2 / year, based on available heat supply, depending on the number of low-grade heat users identified.

Estimated project costs: Expected piping cost of £2-3m in the case of the first phase: a small network based in the east of Ellesmere Port focused on Protos Park (excluding additional costs for heat transfer stations, building modifications and heat storage). If the network is further extended, these costs would increase accordingly due to the additional piping and equipment required.

Heat sources and users: The required heat demand and supply has been calculated to enable a viable and economic network, primarily based in the east of Ellesmere Port.

A combination of different sources and users are being considered:

- For example, the minimum heat demand requirement from Thornton Science Park would be 6300 MWh and from Protos Park tenants it would be 4060 MWh to connect into the network. Waste heat could be utilised to generate hot water at a temperature of approx. 95°C for distribution via the network.
- It may be possible to extend the network beyond the western border of Ellesmere Port, however, to make this economically feasible, this would require a demand of more than 60,000 MWh while costing an additional £8-10m due to the length of piping required.

Technology, construction and operation:

- Technology: The heat network would be a medium temperature hot water network taking available process heat from locations with a waste heat surplus. Operating temperatures for the network are to be determined based on demand side requirements, but temperatures of up to 100ºC are available from the evaluated industrial heat providers' processes. The network would need to incorporate an energy centre (or utilise multiple existing energy from waste / biomass heat generators) to provide back-up heat supplies, pumping and possibly heat storage to balance the demand and supply of heat.
- Design and build: EPCM/EPC, to be considered further with prospective investors and potential delivery partners.
- O&M: Only highly experienced operators with strong sustainability credentials will be considered.

Revenue streams:

- In respect of the heat, sale of either (a) generated heat (from the various biomass and energy-from-waste combined heat and power plants in the vicinity of Protos Park) or (b) recovered waste heat (from industry), exported to users under a "take or pay" or "exclusive supply and first dispatch" arrangement. In respect of any standalone "pipeco" assets, availability payments for use of the network.
- Pricing of heat could be based on a heat price benchmarking mechanism or a floor/fixed price, the former ensuring that the user is guaranteed best value but more challenging from an external finance perspective.
- The selling price for heat via the network would likely be limited by the cost of the counterfactual heat supply for any of the demand side users, which currently this might be expected to be natural gas, but may be electricity or hydrogen in the future.
- The heat supply pricing would also need to account for any investment required by (on behalf of) the end user to modify their processes or buildings to utilise the network heat supply.

Initial stakeholders: Peel (Protos landowner); Thornton Science Park (potential offtaker); confidential large energy users in the vicinity of Protos Park.

Professional advisors to date: Ikigai (bankability); Atkins (heat technical); Ener-Vate (district heating advisor to Peel); Energy Systems Catapult (Whole systems modelling) and EA technology (electrical technical)

Opportunities:

- Private and public sector investors
- Technology and delivery partners (particularly with UK or international experience of delivering complex heat and power networks requiring heat upgrade and storage)
- Additional heat demand (whether commercial, industrial or bulk supply to residential developments)

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