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Comhairle na Gàidhealtachd

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West Bank Heat Network Project

What is a heat network?

A heat network (also called district heating) is a system that supplies heat from a central source to multiple buildings through a network of insulated pipes.

Heat networks can cover a large area or even an entire city. There are various components associated with a heat network, including:

1. Central heat source where heat is produced at a central plant (e.g., energy centre, industrial waste heat, biomass plant, or large heat pumps).
2. Distribution system where hot water (or sometimes steam) travels through underground pipes.
3. Heat delivery to buildings connect to the network via a heat interface unit (HIU), which provides heating and hot water without needing a boiler.

A heat network is controlled in the same way as a traditional central heating system. While the central generation is handled off-site by operators, homeowners, tenants and businesses can manage their individual properties and buildings' heat and hot water using standard in-home controls, such as programmers, digital thermostats, and radiator valves.

Why consider a heat network?

Heat networks are particularly attractive in high-density built-up areas such as city centres, as they can efficiently supply multiple properties from a central source. They are also well suited to new developments and large sites like campuses, where systems can be designed from the outset.

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West Bank Heat Network

Background

Through the Local Heat and Energy Efficiency Strategy (LHEES), a number of priority heat network zones have been identified across Inverness. Among these, the Inverness West Bank has emerged as a high-potential area due to its combination of strong heat demand, planned growth, proximity to anchor loads and alignment with the Council's wider regeneration and carbon reduction ambitions.

A number of feasibility studies have been commissioned in recent years to explore the potential for delivering a heat network within the West Bank area of Inverness. The findings from these studies have been presented to the Climate Change Committee, the City of Inverness Area Committee and other relevant boards to support the strategic development of the project.

The most recent feasibility assessment, completed in 2025/26, examined the integration of local renewable energy sources and their implications for the technical design, operational performance, and economic viability of the network.

What buildings does the West Bank Heat Network cover?

The technical analysis assessed a range of buildings for their suitability to connect to the proposed heat network. A phased approach is recommended, starting with key core buildings and allowing for future expansion over time. This approach aligns with existing plant replacement cycles, helping to coordinate connections efficiently and reduce disruption.

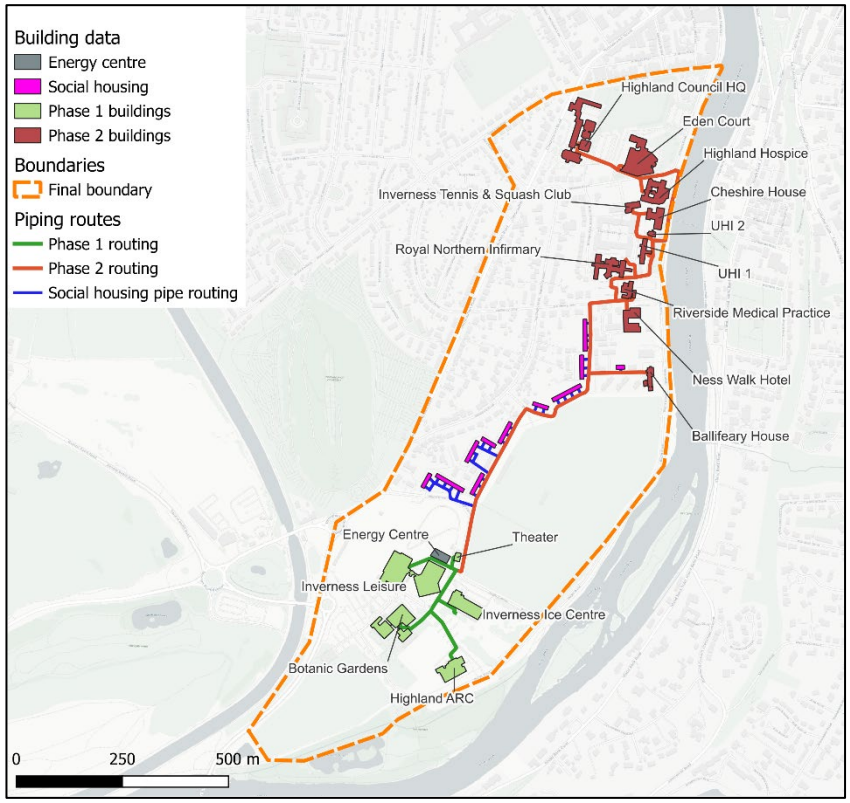
The proposed heat network could serve:

- 20 non-domestic buildings, listed in the table below
- 186 social housing properties
- Additional buildings through future expansion phases

These buildings are indicative only and further stakeholder engagement will be required to secure any potential future heat loads and connections.

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Phase	Connection Year	Connections
Phase 1 (Core)	Under review	Highland Archive and Registration Centre Botanic Gardens Inverness Leisure Centre Inverness Ice Rink Florians Theatre
Phase 2 (Core)	2035	Ballifeary House Cheshire House Eden Court Highland Council HQ Highland Hospice Inverness Tennis & Squash Club Ness Walk Hotel Riverside Medical Practice Royal Northern Infirmary UHI - 1 UHI - 2
Phase 2 (infill)	2035	Social housing cluster Inverness High School St Joseph's R C Primary School Cameron Young Youth Club Central Primary School



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Impact of Torvean Solar Farm

A Feasibility Study in 2025/26, assessed the impact that localised renewable energy generation could have on the performance and viability of a proposed heat network. Modelling was assessed to understand the viability of a standalone heat network and integrating renewable generation. A range of options were considered, including rooftop solar PV on energy centre sites and existing buildings, Ness Hydro and a Utility Scale Solar array at the former Torvean Quarry.

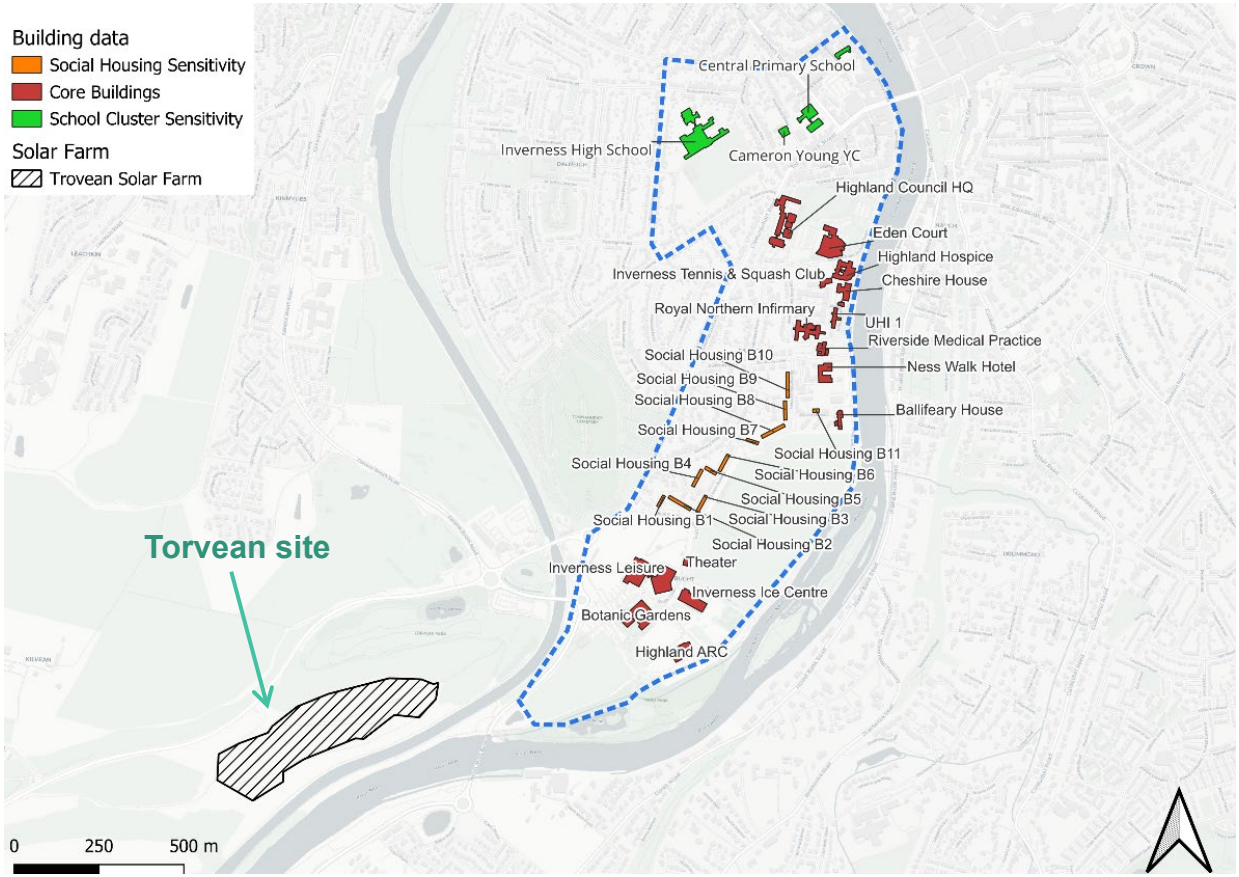
The strongest scenario modelled was the integration of a Utility Scale Solar array at the former Torvean Quarry with the West Bank Heat Network which significantly improves commercially viability and reduces the cost of heat. Inclusion of a Utility Scale Solar array significantly reduces anticipated heat costs and increased Internal Rate of Return (IRR).

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Benefits of Integrating Torvean Solar PV

- Modelling from the recent feasibility study indicates that locally generated renewable electricity could supply around 41% of the energy centre's total electrical demand. For example, a 5MWp utility-scale solar array at the former Torvean Quarry is projected to contribute approximately 36% of this demand on its own over the project's lifetime.
- Solar PV provides a renewable source of electricity, helping to further reduce the carbon intensity of heat supplied and supporting Highland Council's and Scotland's Net Zero ambitions.
- By generating electricity within close proximity to the site, the network becomes less exposed to fluctuations in wholesale electricity prices, improving long-term cost certainty.
- Although Solar PV increases upfront capital costs, the reduction in electricity consumption from the grid can lower lifetime fuel costs and improve the overall business case.
- Local generation can increase the self-sufficiency of the energy system and provide greater resilience against disruptions in external electricity supplies.
- Integrating Solar PV with thermal storage and heat pumps can maximise the use of renewable electricity and improve system efficiency.
- Surplus electricity generated during periods of low demand could potentially be exported to the grid or used to supply other Council assets, creating additional value.
- The integration of Torvean Solar PV aligns with the Highland LHEES and wider ambitions to develop integrated local energy systems.

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Carbon Impact

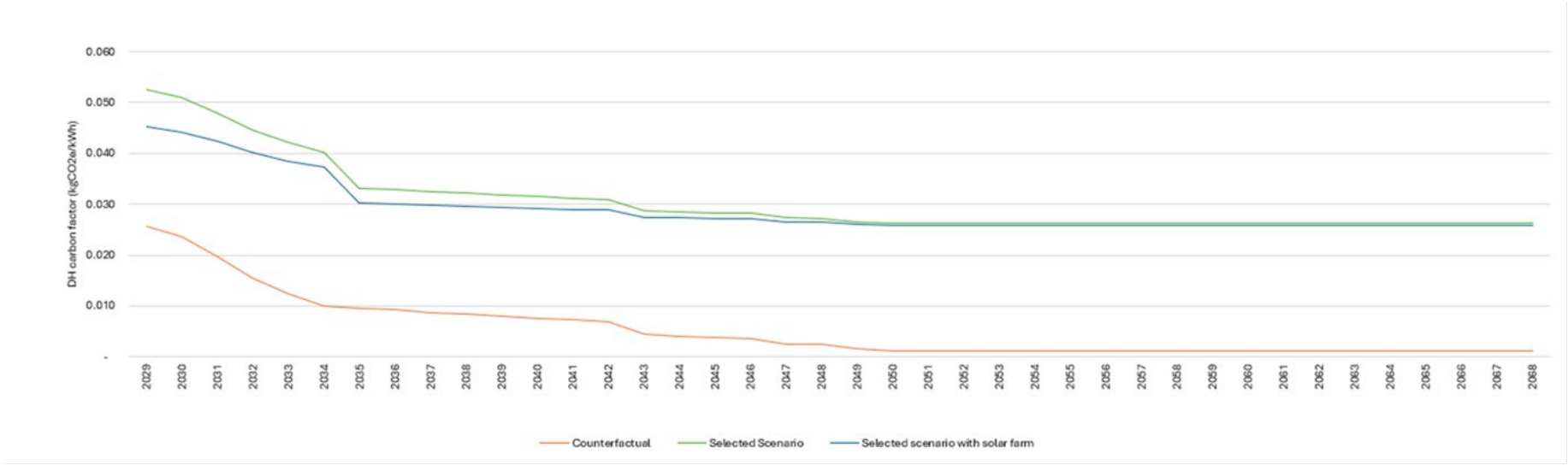
The selected Heat Network without Torvean Solar Farm scenario demonstrates very low carbon performance, with emissions estimated at approximately 0.025–0.030 $kgCO_2e/kWh$. This is significantly below the UK low-carbon heat network threshold of 0.100 $kgCO_2e/kWh$, indicating that the proposed system would operate as a highly efficient, low-emission heat supply.

For context, conventional gas heating typically produces around 0.180–0.200 $kgCO_2e/kWh$. This means the proposed heat network would reduce carbon emissions by approximately 80–85% compared to a gas-based system, representing a substantial decarbonisation benefit.

The carbon savings over the 40-year period are estimated to be approximately 755 tCO_2e with the introduction of the Torvean Solar Farm. This has been calculated by removing the grid carbon factor from the electricity generated by renewable sources. The overall impact may be lower than expected, primarily due to the fast decarbonisation of the grid reflected in the Green Book data.

The figure below presents a comparison of carbon savings across the counterfactual scenario, a standalone heat network (selected scenario) and a heat network integrated with the solar farm (selected scenario with solar farm).

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Political



- The Heat Networks (Scotland) Act support the development of heat networks.
- LHEES identifies opportunities for heat network deployment and place-based decarbonisation.
- Public sector leadership is key to anchor loads and investment.
- Funding uncertainty affects long-term viability.

Economic



- Significant upfront capital investment is required.
- Network viability depends on achieving sufficient heat demand density and securing anchor loads.
- Inverness's growth and mixed-use developments offer economies of scale.
- Stimulate local employment and supply chain development.

Social



- Contribute to reducing fuel poverty and improving thermal comfort.
- Provide health and wellbeing co-benefits.
- Public understanding and acceptance are key to successful uptake.
- Engagement with residents, businesses and public sector organisations is essential to secure connections and build confidence.

Technological



- Potential heat sources include large heat pumps.
- Existing gas infrastructure and dispersed development patterns may constrain network expansion.
- Building readiness and safeguarding of plant space and connection routes are crucial for future connections.
- Skills availability will affect deployment scale and pace.

Legal



- Compliance with the Heat Networks (Scotland) Act 2021, regulations and licensing is required.
- Planning policy can support heat network safeguarding and connections.
- Land ownership, wayleaves and mixed tenure arrangements can complicate delivery.
- Consumer protection requirements and technical standards must be met.

Environmental



- Reduce carbon emissions.
- Improve energy efficiency and resource use.
- Enhance energy resilience and reduce dependence on fossil fuels.
- Environmental constraints may affect network routing and infrastructure locations.