

Heatropolis Beta Phase Annual Progress Report

Ofgem Strategic Innovation Fund (SIF)



passiv



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1. Executive Summary

Project background

Heatropolis is a Strategic Innovation Fund (SIF) Beta Phase project addressing the challenge of heat decarbonisation in the Great Britain (GB) energy system. Heat currently represents a significant share of carbon emissions, and the project aims to demonstrate how heat networks can contribute to system flexibility and support the transition to net zero. The Beta Phase builds on the Alpha Phase by demonstrating technical, commercial, and digital solutions that enable heat networks to provide demand-side flexibility services.

Project scope

The Heatropolis project is structured around three iterative Trials, each designed to test and refine both technical and commercial solutions for decarbonising heat networks. These Trials are conducted across three representative archetypes:

- **Archetype 1 – Large mixed-use network:** King's Cross (commercial and residential)
- **Archetype 2 – Medium residential estate:** Westland Heath
- **Archetype 3 – Small residential network:** A multi-occupancy building (currently in recruitment)

Each Trial phase has a distinct focus:

- **Trial 1:** Baseline assessment, establishing current operational and commercial conditions.
- **Trial 2:** End-to-end integration, testing the full suite of technical and commercial interventions in a live environment.
- **Trial 3:** Business as Usual (BaU) transition, validating the framework and digital solution for sector-wide rollout.

Technical solutions being Trialled include the deployment of additional thermal storage, additional heat pump capacity, and smart controls at both the building and energy centre levels. These interventions are designed to optimise heat network operations, enabling demand-side flexibility.

Commercial solutions focus on piloting different flexibility products to incentivise Heat Network Operators (HNOs) to provide flexibility services to the energy system. Alongside this, the project is developing a comprehensive cost-benefit analysis (CBA) to quantify the total value delivered by these interventions for all stakeholders.

A key component of the project is the development of a digital tool to streamline the connection process for heat networks, improve visibility of connection options, and facilitate data exchange between HNOs and Distribution Network Operators (DNOs). This tool is being iteratively refined based on user feedback and will support the transition to BaU practices across the sector.

Project progress

During the reporting period, the project has made substantial progress across all key workstreams, positioning the project for successful delivery of its first Trial in 2026. The following highlights summarise the main progress:

1. Securing Trial Sites

- Archetypes 1 and 2 (King's Cross and Westland Heath) have been fully secured and onboarded, with all necessary contractual and operational arrangements in place to support their involvement in the Trials. This milestone was a critical Stage Gate requirement and underpins the project's ability to deliver robust, scalable results.
- For Archetype 3 (multi-occupancy residential building), a permanent site has not yet been secured. However, the mitigation strategy has been activated for Trial 1. Baseline data will be collected from surrogate sites, and Trials of domestic smart controls will proceed at alternative Metropolitan-operated networks. Engagement with potential site owners is ongoing, with a plan to secure a permanent site for Trial 2.

2. Completion of Trial Strategy and Trial 1 Detailed Design

- The detailed Trial strategy and delivery planning for all three Trials and Archetypes has been completed and formally agreed by project partners, including but not limited to the Trial execution governance framework with

clear roles and responsibilities, the technical and commercial objectives of each Trial and a structured approach to data management, analysis and customer engagement.

- Trial 1 detailed design is well underway, with preparatory activities underway at both King's Cross and Westland Heath. This includes energy centre control upgrades, integration of smart controls, and the development of intervention schedules for both energy centre and building-level Trials.

3. Preparation and Readiness for Trial 1

- Archetype 1 (King's Cross):
 - Energy centre control software upgrades have been completed, enabling flexible operation of the existing thermal stores and data capture.
 - Data correctors are being installed on the large boilers to monitor their performance via the Energy Centre Building Management System (BMS).
 - Inverter drivers are being procured to monitor and adjust the thermal store operation effectively.
 - The heat recovery heat pump has been delivered and is being installed (as part of the wider King's Cross decarbonisation works), with commissioning scheduled ahead of the Trial.
 - Application Programming Interface (API) integration for commercial building smart controls ([NODA](#) platform) has been implemented and communications tested across 11 commercial buildings.
 - A detailed intervention schedule has been developed to baseline demand, test flexibility, and evaluate optimisation strategies.
- Archetype 2 (Westland Heath):
 - The site is fully decarbonised, with all major equipment installed and operational. This site provides a unique opportunity, as the residential site is not at full capacity, meaning that heat demand will be below the heat network's capacity, which will allow us to experiment with various combinations of the air source heat pumps (ASHPs) and thermal storage capacities, to assess their impact on total electricity demand.
 - Control software upgrades are underway to enable advanced scheduling and integration with smart domestic controls.
 - Recruitment and preparation for the Passiv Smart Thermostat Trial are ongoing, with installations planned for early 2026.
 - A week-by-week intervention plan is in place to test plant configurations, load shifting, and the impact of smart controls.
- Archetype 3 (TBC):
 - Surrogate sites have been identified for baseline data collection and smart control Trials.
 - The project continues active engagement with potential permanent sites, with a clear plan to transition as soon as a suitable site is secured.

4. Commercial Arrangements and Business Case

- We identified and reviewed a range of commercial opportunities to incentivise HNOs, including innovative connection agreements and flexibility market participation, laying the groundwork for scalable investment in flexibility-enabling technologies.
- Finished the first iteration of the Beta Phase business case which demonstrated that Heatropolis could unlock over £3 billion in whole-system benefits by 2050 but highlighted the need to close an £800 million funding gap for HNOs across GB to invest in the necessary technology.

5. Requirements Gathering for Digital Customer Tools

- Extensive stakeholder engagement has been conducted, including workshops, interviews, and industry surveys, to validate user needs and inform the design of digital tools.

- The project has decided to focus on the Customer Connections Service Tool (CCST), deprioritising the Customer Data Exchange Tool (CDET) based on market feedback and value assessment.
- Requirements gathering and initial options assessment are complete, with a decision-making roadmap in place for the next phase.

6. Trial Customer Engagement

- Finalised the Customer Engagement Strategy, covering all Trial phases (pre-Trial, ramp up, main phase, wind down) and tailored for each archetype. Key principles include trust, transparency, fairness, and protection for vulnerable customers. Recruitment and communications are designed to ensure inclusivity and GDPR compliance, with incentives budgeted to support participation.
- Completed primary research which surveyed over 900 heat network customers across GB to gather robust insights into customer satisfaction, attitudes to flexibility, smart controls, and data sharing.

7. Heatropolis SIF Beta Phase Stage Gate 1

- The project successfully passed its first Stage Gate, with all required deliverables submitted and approved by Ofgem and the monitoring team. This included confirmation of Trial sites and strategy, detailed Trial strategy, progress on digital customer tools, and comprehensive stakeholder engagement planning. The Stage Gate review validated the project's readiness to proceed to the next phase and recognised the robust risk management and stakeholder engagement approach.

Delays and problems encountered

Heatropolis has encountered some early challenges that are typical of complex, multi-partner initiatives. At project initiation, there were delays linked to securing the necessary legal commitments from the owner of one of the Trial sites. These were resolved without any impact on the overall project plan or delivery schedule, and all delays were effectively managed.

The main challenge faced to date has been the identification and onboarding of the final Trial site, a suitable site to represent Archetype 3 — a small-scale, multi-occupancy residential building. To maintain progress for Trial 1, the project team have made the decision to use modelling and baseline data from surrogate sites.

In parallel, engagement activities to validate the problem statement and inform the development of the digital tools required extensive input from a broad range of stakeholders, which proved more complex than anticipated. However, this has not impacted project delivery or the planned schedule of activities.

Key metrics developed by the Project

- **Quantified system-wide benefits:** The first Beta Phase CBA estimates that Heatropolis could deliver up to £3.2 billion in whole-system benefits by 2050, with £2.3 billion accruing to GB energy consumers and 6.6 million tonnes of carbon dioxide equivalent (MtCO₂e) emissions avoided. These were calculated by modelling the system-wide impacts of deploying the Heatropolis solution across the GB, quantifying benefits such as reduced network reinforcement costs, avoided Capacity Market costs, consumer savings, and avoided CO₂ emissions, based on projected adoption rates, peak demand reductions, and financial and environmental metrics up to 2050.
- **Modelled peak demand reduction:** Across the three Trial archetypes, implementation of Heatropolis is projected to reduce peak load by 46–63%. This is based on energy modelling software and will be validated through the Trials.

Summary of dissemination activities carried out

Heatropolis has a dedicated Work Package (WP) 7 focused on Stakeholder Engagement and Knowledge Dissemination, aimed at securing project buy-in, maximising learning dissemination, and engaging key partners. The team disseminates project insights and outcomes through targeted channels and industry events.

To date, Heatropolis has been presented and discussed at several key industry forums, including:

- Decentralised Energy Conference 2024
- Energy Innovation Summit 2024

- Utility Week 2025
- Association of Decentralised Energy's (ADE) Heat Network Forum 2025
- Energy Innovation Summit 2025

These activities have helped raise awareness of the project, share early findings, and foster collaboration across the electricity and heat network sectors.

Useful links and key project documents

All key project documents, updates, and outputs from Heatropolis are available on the [UK Power Networks Innovation](#) site, where you will be able to find reports, presentations, and insights as the project progresses. The project is also listed on the [ENA Smarter Networks Innovation Portal](#), which provides an overview of Heatropolis and links to related innovation initiatives across the GB energy networks sector.

2. Project Summary

SIF Innovation Challenge.

Heatropolis is a SIF Round 2 Beta Phase project. It addresses Innovation Challenge 4: **Accelerating decarbonisation of major energy demands**. Heatropolis aims to reduce the costs of connecting and operating decarbonised heat network, resulting in improved system level efficiencies and better integration of heat networks in the energy system.

The project is Trialling technical solutions and commercial frameworks that unlock flexibility, reduce decarbonisation costs, and support low-carbon heat solutions. Through real-world Trials and innovative business models, Heatropolis delivers scalable approaches aligned with net zero targets.

Key Contributions:

- **Cost-effective integration** of heat networks with electricity systems to ensure whole system benefit.
- **Flexibility and demand management** using smart controls and thermal storage to reduce peak demand.
- **Decarbonisation of heat** through low-carbon sources and whole-system planning.
- **Innovative commercial models** to incentivise collaboration between HNOs and DNOs.

Problem and Opportunity

The problem we set out to solve

Decarbonising heat remains one of the most pressing challenges on the UK's path to Net Zero. Heating (and hot water) in buildings accounts for about 23% of all UK emissions according to the Climate Change Committee and the government's Heat & Buildings Strategy¹. Among the various pathways studied, heat networks are increasingly seen as one of the most cost-effective pathways for decarbonising building heat.

A heat network supplies heating and hot water from a central energy centre to multiple properties or buildings through insulated pipes. By aggregating heat demand across multiple properties and enabling centralised deployment of low-carbon equipment, heat networks offer significant efficiency gains and unlock options that individual properties cannot easily access such as waste heat recovery and large-scale thermal storage.

Heat networks will play a central part in the decarbonisation of heat in buildings across the UK. Around 3% of UK heat demand is currently supplied by heat networks, and modelling from National Energy System Operator's (NESO) Future Energy Scenarios (FES)² indicates that this could rise to 20% by 2050 in line with wider Net Zero trajectories. However, more than 90% of existing heat networks currently rely on fossil fuels, highlighting the scale of transformation required.

The opportunity

While most heat networks currently rely on fossil fuels, future heat networks will ultimately need to be net-zero compatible. As heat networks decarbonise, electrification is projected to play an increasingly central role, which impacts both DNOs and the wider electricity system. Currently, however, there are limited commercial incentives for heat networks to manage their electrical loads in line with electricity network needs. This creates a major opportunity for coordinated, whole-system approaches that optimise both heat-network operation and local electricity network investment. However, the sector currently lacks tested commercial models, integrated digital tools and real-world evidence on how heat networks can flex their demand to support an efficient and cost-effective decarbonisation pathway.

Key learning from the Alpha Phase demonstrated the potential: Metropolitan's desktop modelling showed that investment in smart controls and thermal storage could reduce peak heat-network demand by up to 85%, and early thermal-response testing confirmed how flexible operation can influence electrical load in practice. Yet these insights remain largely untested at scale. There is now a clear need to validate how innovative commercial arrangements,

¹ [Equality impact assessment for the Heat and buildings strategy - GOV.UK](#)

² [Future Energy Scenarios 2024 Data Workbook_V006_0.xlsx](#)

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automated smart controls and thermal storage can enable heat networks to actively support whole-system planning and optimise network investment as the UK transitions to low-carbon heat.

How the project helps?

Heatropolis aims to demonstrate how flexible, data-driven operation of heat networks can support whole-system planning and enable more efficient, optimised investment across both heat and electricity networks. While modelling in previous phases demonstrated the technical potential for flexibility, the Heatropolis Beta Phase is focused on conducting live Trials with real assets, which are critical to building the evidence base that will shape future heat network design and their connections to electricity networks.

Heatropolis will showcase innovative commercial and technical arrangements through three winter Trial periods, providing iterative learnings. These Trials will generate robust evidence to support BaU adoption and deliver long-term benefits across the sector.

Milestones and Achievements

Over the project's first year, the following milestones and deliverables have been met in-line with the original project plan:

Work Package	Deliverable Description	Completion
WP1	Project kick-off and detailed governance	April 2025
	Stage Gate 1- 2025	August 2025
	Annual progress report 2025	November 2025
WP2	Key commercial design principles and business case methodology	June 2025
	Integrated business case 2025	October 2025
WP3	Heatropolis Trial strategy	July 2025
WP5	Business objectives and high-level functional requirements of the digital tools	August 2025
WP6	Customer engagement strategy and plan	August 2025
	Trial 1- customer engagement survey design	October 2025
WP7	Stakeholder engagement and knowledge dissemination plan	April 2025
	Annual relevant project horizon scans 2025	April 2025

Performance Against Objectives

The Heatropolis project is performing strongly against its stated aims and objectives:

Developing, Trialling, and demonstrating new commercial arrangements and technical solutions that unlock flexibility within low carbon heat networks.

- Key commercial principles to be explored have been defined through WP2. Details for the commercial principles and CBA can be found in [Section 5. Data Access Details](#) and [Section 9. Impacts and Benefits](#).
- Beta Phase Trials are on track to start in January 2026, with planning and design activities progressing as scheduled.

Testing business models and technical solutions across three heat network archetypes.

- Archetype 1 and Archetype 2 sites are secured, and Trial 1 preparation has commenced – starting with baseline heat demand data collection and agreed intervention planning.
- Archetype 3 recruitment is ongoing, and a surrogate site has been agreed for baseline data modelling to ensure Trial 1 learnings are captured.

Developing enhanced digital customer connections and planning tools

- Extensive engagement with stakeholders has been conducted to understand business needs and operational challenges.
- Exploration of a digital solution for streamlining electricity connection processes between HNOs and DNOs is progressing.

Conducting two-way consumer engagement

- Primary Research which surveyed over 900 heat network customers across GB has been completed to capture consumer views and preferences. The Primary Research report will be published on the Heatropolis webpage.
- Additional engagement activities have been carried out to inform Trial design and communication strategies.

The Beta Phase of Heatropolis has delivered significant progress toward its innovation objectives. Key outputs include:

- The definition of commercial principles and the design of technical integration frameworks that will be tested in upcoming Trials.
- Sites for Archetypes 1 and 2 have been secured and a surrogate site agreed for Archetype 3 to ensure sufficient data will be gathered.
- In parallel, the project has produced engagement frameworks, completing primary consumer research and extensive stakeholder engagement to inform Trial design and business case development.
- A notable outcome is the initial options assessment for a digital solution to streamline electricity connection processes between HNOs and DNOs, supporting the sector's transition to electrification.

Collectively, these outputs demonstrate Heatropolis' role in shaping new processes and services that enable cost-effective integration of heat networks into the wider energy system, while laying the groundwork for scalable, low-carbon solutions.

Overall, the project is on track to deliver its Beta Phase objectives. Progress has been consistent despite early challenges with Trial site onboarding, which were mitigated through proactive planning and surrogate data modelling.

Project Outputs and Outcomes

The project outputs and outcomes are tracked through the key milestones of the project which are outlined in the table below.

Work Package	Milestones	Deliverable Description	Status
WP1	M1.1	Project kick-off	Complete
WP1	M1.2	Mid-point review	Not started
WP1	M1.3	Stage Gate 1: Digital customer tools	Complete
WP1	M1.4	Stage Gate 2: Trial 2	Not started
WP1	M1.5	Stage Gate 3: Trial 3	Not started

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WP1	M1.6	End Point catchpoint and closure	Not started
WP2	M2.1	Business cases confirmed for Trial 1	Complete
WP2	M2.2	Business cases confirmed for Trial 2	Not started
WP2	M2.3	Business cases confirmed for Trial 3	Not started
WP2	M2.4	BaU business case and commercial arrangements	Not started
WP3	M3.1	Trial 1 design approved	Ongoing
WP3	M3.2	Trial 2 design approved	Not started
WP3	M3.3	Trial 3 design approved	Not started
WP4	M4.1	Trial 1 initiated	Ongoing
WP4	M4.2	Trial 1 complete	Not started
WP4	M4.3	Trial 2 initiated	Not started
WP4	M4.4	Trial 2 complete	Not started
WP4	M4.5	Trial 3 initiated	Not started
WP4	M4.6	Trial 3 complete	Not started
WP5	M5.1	Digital customer tools internal decision gate	Ongoing
WP5	M5.2	Customer Connection Service Tool (CCST) Procurement, governance and contracting	Not started
WP5	M5.3	CCST tool implementation	Not started
WP5	M5.4	Customer Data Exchange Tool (CDET) High level design approved	Descoped
WP5	M5.5	CDET tool implementation	Descoped
WP6	M6.1	Customer engagement strategy and plan approved	Complete
WP6	M6.2	Customer engagement insights from Trial 1 published	Not started
WP6	M6.3	Customer engagement insights from Trial 2 published	Not started
WP6	M6.4	Customer engagement insights from Trial 3 published	Not started

WP7	M7.1	Stakeholder engagement and dissemination plan approved	Complete
WP7	M7.2	Trial 1 learnings Published	Not started
WP7	M7.3	Trial 2 learnings Published	Not started
WP7	M7.4	Trial 3 learnings Published	Not started
WP8	M8.1	Midpoint BaU transition	Not started
WP8	M8.2	Final BaU transition defined	Not started

Difficulties and Challenges

While the Beta Phase has been progressing well overall, some early challenges required adjustments to maintain momentum. Our approach to site selection was proactive and inclusive, with a strong focus on engaging potential Archetype 3 site owners from the outset. While finalising legal agreements across the consortium took longer than anticipated — primarily due to dependencies on securing commitment from the Archetype 1 site owner — we overcame this by intensifying targeted engagement and maintaining open, regular dialogue. This ensured all contracts were completed by April 2025, allowing the project to move forward with full stakeholder alignment.

Recruitment for Archetype 3 has presented challenges. Dialogue with potential site owners revealed space constraints, absence of heat interface units (HIUs) and planning permission requirements for additional thermal storage or ASHPH. To overcome these, we adopted a multi-channel approach — identifying potential sites through industry forums, leveraging existing connections, and distributing targeted newsletters. This structured engagement enabled us to evaluate a wide range of options and, when direct recruitment proved unfeasible for Trial 1, we implemented a robust mitigation plan by adopting a surrogate site for baseline data modelling. The surrogate site is not decarbonised but will allow us to gather baseline heat demand data for an Archetype 3 site. This approach has kept the project on track and ensures we are well positioned to continue recruiting for Trial 2.

Stakeholder engagement proved complex at times, particularly in defining requirements for digital tools and supporting smaller partners with limited resources. To address this, we prioritised early and continuous engagement and worked closely with industry experts to map the stakeholders we needed to engage with. We expanded our approach by creating an additional survey to broaden our reach and ensure diverse input. This strategy enabled us to engage a wider range of stakeholders and support all partners in contributing meaningfully to solution design.

3. Knowledge Creation and Dissemination

Learning is a critical component of the Heatropolis Beta Phase. It not only strengthens the delivery approach but also ensures that technical insights from Trials and innovation activities are captured for future applications. The project has dedicated deliverables focused on documenting technical learnings from Trials, alongside regular sessions to review lessons learned from the overall approach. This structured process enables continuous improvement and supports knowledge dissemination across the consortium and the wider sector.

In its first year, the project has captured the following learnings across all WPs:

Team Coordination & Contractual Arrangements

Effective team coordination has been essential for managing the diverse consortium of partners involved in Heatropolis. The project has developed clear governance structures, regular communication, and well-defined working practices to keep activities aligned and on track. A particular challenge has been the development and execution of contractual agreements with site owners, which demand early engagement and transparent negotiation to accommodate different organisational requirements and timelines. Detailed impact and mitigation strategies for this challenge can be found in [Section 10. Risks, Issues and Constraints](#).

Data (Modelling, Sharing, Integration)

Data has been at the heart of the project, with the need to align and integrate multiple datasets from various sources. This includes historic data from partners, new data generated through project modelling, future Trial results, and information from external stakeholders. Ensuring data quality, consistency, and timely sharing across WPs has been challenging but is critical for robust business case development, technical modelling, and validating project outcomes. To address these challenges, the project has developed specific strategies for data management and sharing, including early identification of data needs, standardisation of formats, and regular coordination between partners to ensure timely access and integration. Detailed impact and mitigation strategies for this challenge can be found in [Section 10. Risks, Issues and Constraints](#).

Site Recruitment and Securing

Recruiting and securing a communal building as a Trial site (Archetype 3) has proven to be one of the most complex aspects of the project. The process often involves overcoming logistical, technical, and commercial hurdles, as well as significant non-technical concerns such as resource constraints, non-SIF funding limitations, physical limitations, and tight timelines. To address these challenges, the project team has developed a detailed site engagement approach and a mitigation plan for Trial 1 without an Archetype 3 that allows for learnings to still be valuable without the participation of this site. Detailed lessons learned from these experiences have been captured and are proving valuable for ongoing and future site recruitment efforts. Detailed impact and mitigation strategies for this challenge can be found in [Section 10. Risks, Issues and Constraints](#).

Stakeholder Engagement

Continuous engagement with a broad range of stakeholders — including DNOs, HNOs, regulators, local authorities, and industry bodies has been vital for project buy-in and successful delivery. Structured engagement plans, regular workshops, and open channels of communication have helped to align priorities, facilitate co-design, and ensure that the project remains responsive to stakeholder needs and expectations. Examples include:

- Engagement with more than 10 heat network operators and developers to understand their needs regarding their electricity connection application process.
- Early engagement with NESO to validate flexibility and capacity market benefits, ensuring alignment on reducing peak demand and supporting system decarbonization.

Customer Research

Customer research has been conducted for two distinct but complementary purposes. Under WP5, the team engaged directly with a range of HNOs and developers to identify and capture their pain points in the connection process, particularly when considering future decarbonised heat network applications. This engagement provided valuable insights into user needs and preferences, which are actively informing the development of the digital solution.

In addition, the project undertook a large-scale Primary Research survey of over 900 heat network customers across GB. This research explored customer attitudes towards heat networks, flexibility, and smart controls. The findings are being used to shape the design of the Trials and to inform the development of commercial arrangements that reflect

real-world challenges faced by customers. Detailed insights from our Customer Research can be found in [Section 5. Data Access Details](#).

Regulatory Alignment

Regulatory alignment is a critical success factor for Heatropolis, especially as the policy and technical standards landscape for heat networks is evolving rapidly. The project is concluding just before the next regulatory price control, and while new technical standards for heat networks are under development. Ongoing engagement with regulators and standards bodies is essential to ensure that project outputs remain relevant and can be integrated into the future regulatory framework. Detailed impact and mitigation strategies for this challenge can be found in [Section 10. Risks, Issues and Constraints](#) and a detailed assessment of the Policy, Regulatory and Standard Barriers can be found in [Section 7. Policy, Regulatory and Standard Barriers](#).

4. Intellectual Property Rights Generation

The foreground Intellectual Property Rights (IPR) generated through the project include what is needed for the implementation of learnings from Heatropolis by GB network operators. This covers the data, methodologies, and knowledge developed to enable networks to operate and integrate flexible, low-carbon heat networks using the Heatropolis framework and supporting digital solutions.

The foreground IPR is being generated through collaboration between the project consortium (and the relevant subcontractors, where applicable). The foreground IPR generated through Heatropolis during this reporting period primarily relates to:

Foreground IPR Generated	Details
Project Documentation	Includes quarterly monitoring packs, annual reporting, Stage Gate documentation, and WP outputs (e.g., Trial design, stakeholder engagement reports).
Commercial Arrangements	The development of novel commercial arrangements, flexibility product definitions, and incentive mechanisms designed to encourage HNOs to provide flexibility services to the electricity network.
CBA Models	Proprietary algorithms and sensitivity analysis tools for calculating system benefits and assessing consumer bill impacts.
Site Recruitment	Processes and criteria for selecting Trial sites, including archetype mapping and suitability assessment framework.
Trial Strategy	Overall approach for designing and executing Trials, including comprehensive documentation of the Trial approach, describing the iterative structure (baseline, end-to-end integration, BaU transition), and archetype selection.
Trial Design	Detailed design for Trial 1, including technical configurations, operational parameters, and technical/commercial intervention plans.
Customer Insights for digital solutions	Findings on user pain points, objectives, and engagement preferences including stakeholder interviews and market analysis.
Digital Solution Specifications	Functional and non-functional requirements, user journey documentation, options assessment for the CCST.
Primary Research Findings	Original research outputs informing customer attitudes towards heat networks, flexibility and smart controls.
Customer Engagement Strategy	Structured approach for engaging HNOs and end-users, including communication plans and feedback loops.
Stakeholder Engagement Plan	Framework for engaging regulators, operators, and other stakeholders throughout the project lifecycle.

As relevant foreground IPR is created, it will be documented and shared across networks through agreed dissemination channels (as detailed in [Section 11](#)) such as webinars, published project outputs on the [UK Power Networks Innovation website](#) and the [ENA Smarter Networks Innovation Portal](#), ensuring transparency and sector-wide benefit.

5. Data Access Details

Data and Insights Produced

During the first year of the Beta Phase, the Heatropolis Project has generated a range of data and insights that underpin technical modelling, commercial analysis, and stakeholder engagement insights. These datasets provide the foundation for validating assumptions, refining business cases and informing future work. Key categories include:

Category	Scope	Key Insights Produced	Data Examples	Access
Heat Network Operational Data and Baseline	Data from participating heat network sites: load profiles, asset performance, flexibility indicators.	- Quantified variability in peak loads across archetypes - Identified 15–20% flexibility potential in thermal storage	- Hourly heat demand curves - Peak load variability - Asset utilization rates	- Data owned by Metropolitan - Available upon request subject to commercial sensitivity
Commercial Modelling Outputs	Interim business case assessments and scenario modelling using early site data and Alpha Phase assumptions.	- Electrification is viable under low-carbon electricity pricing - Payback periods sensitive to electricity network connection costs - More insights can be found in Section 9. Impacts and Benefits	- Net Present Value scenarios - Payback periods - Whole-system CBA	- Insights presented at Energy Innovation Summit and ADE Heat Network Forum 2025 - Summary report will be published on the Heatropolis website; until then, insights and data are available upon request
End-customer Primary Research	Gather insights from residential heat network customers on their experiences, perceptions, and concerns to inform the design of the Heatropolis Trials, which will test various heat network commercial arrangements, smart controls, and thermal storage solutions.	- Customers' satisfaction with their heating systems varies - Customers are generally open to flexible heating and data-driven management when the benefits are clear, and data is handled responsibly and transparently - Cost savings are the strongest motivator for engagement, while community or innovation-led appeals have less influence - Many are willing to share usage data if they understand how it will be used and trust that operators will handle it responsibly	- Raw survey results - Subgroup analysis - Drivers and barriers to flexibility, trust and data sharing.	- Insights presented at Energy Innovation Summit and ADE Heat Network Forum 2025 - Summary report will be published on the Heatropolis website; until then, insights and data are available upon request
Stakeholder Engagement	Engagement with heat network developers to	Identified pain points in connection process	Interview and workshop transcripts	Insights presented at Energy Innovation

	understand views on connection process and gather evidence for digital tool development.	- Gathered requirements for digital tool - Evidence of need for streamlined solutions	- Survey results - Thematic analysis - Requirements documentation	Summit and ADE Heat Network Forum 2025 Data are available upon request
Technical Feasibility Studies	Engineering analysis of asset integration, procurement sequencing, and interoperability challenges across diverse network archetypes.	- Flexible operation strategies validated at King's Cross and Westland Heath - Successful API integration for smart controls - Passive Smart Thermostat adapted and bench-tested for HIUs. - Mitigation strategies for site selection challenges - Cybersecurity protocols implemented for data exchange	- Site-specific engineering plans - Control upgrade documentation - Trial design frameworks	Insights presented at Energy Innovation Summit and ADE Heat Network Forum 2025

6. Route to Market / Business as Usual

Heatropolis is on track to deliver a scalable, replicable solution for decarbonising heat networks, with a robust strategy for BaU integration, sector adoption, and commercialisation. The project's iterative, evidence-based approach, combined with strong sector engagement and a clear roadmap, positions it for large-scale deployment and long-term impact.

Lead Network

The Heatropolis project is designed from the outset to enable integration into BaU for UK Power Networks and to provide a replicable blueprint for other networks. Key steps include:

- **Dedicated BaU Transition WP:** WP8 focuses on business change, readiness activities, and regulatory engagement to ensure a smooth transition to BaU by Beta Phase completion.
- **Process and Product Updates:** Insights from the three iterative Trials are being used to update internal processes, technical standards, and commercial arrangements. This includes refining connection procedures, flexibility products, and digital tools to support decarbonised heat networks.
- **Sector-Wide Knowledge Sharing:** WP7 is responsible for external stakeholder engagement and dissemination, ensuring learnings are shared with other DNOs, HNOs, and industry bodies to facilitate sector-wide adoption and avoid competitive advantage through information withholding.

Steps and Additional Work Required Before Adoption

- **Completion of Beta Phase Trials:** The three winter Trials (2025–2028) will validate technical, commercial, and operational aspects of the framework and digital tools.
- **Regulatory and Commercial Model Refinement:** Engagement with Ofgem and other industry bodies to influence market policy and adapt commercial models for scale.
- **Stakeholder Engagement and Training:** Continued dissemination, workshops, and direct support to help partners and external networks adapt and implement the Heatropolis approach.
- **Post-Beta Phase Roadmap:** A roadmap (to be included as an [Appendix](#)) outlines the steps for full BaU integration, sector rollout, and international replication.

Likelihood of Large-Scale Deployment

The framework and digital tools are designed to be scalable and replicable across the GB, with strong sector and financial partnerships supporting widespread adoption.

Based on engagement during the first year of the Beta Phase, Heatropolis shows strong potential for large-scale deployment across GB. Early engagement with HNOs, technology providers, local authorities, and other DNOs has demonstrated clear interest in the Heatropolis approach — particularly to whole-system design for coordinated planning of electrified heat to support decarbonisation and manage future demand efficiently, with the Heatropolis framework itself to be designed for replication.

Multiple stakeholders like HNOs, local authorities, and developers have been actively participating in workshops, providing feedback and expressing interest in adopting the Heatropolis approach beyond this pilot phase.

Heatropolis has also been highlighted in the Clean Flexibility Roadmap from the Department for Energy Security & Net Zero (DESNZ), Ofgem, and NESO as a strategically important project, underscoring the national-level recognition of its approach and the need for regulatory and policy alignment to support future commercial frameworks and sector-wide adoption.

Recommendations for Further Exploitation

- **Expand Partnerships:** Engage additional networks and stakeholders, especially for later Trials and BaU rollout.
- **Leverage Finance and Policy:** Advocate for supportive policy and regulatory frameworks and pursue partnerships with institutional investors.

- **International Replication:** Explore opportunities for international deployment, leveraging the project's scalable design and sector engagement.

Differences from Beta Phase Application

- **Regulatory Alignment Brought Forward:** The project accelerated its regulatory and policy alignment activities, bringing forward engagement with NESO, ED3 Planning team and integrating regulatory assessment into the core project plan earlier than originally scheduled. This ensures that Heatropolis is positioned to respond to the evolving regulatory landscape for heat networks and supports future BaU adoption.
- **Digital Tools – Removal of CDET:** While the application proposed developing both the CCST and CDET, the CDET was removed from scope during the Beta Phase. This decision was made because the added value of a two-way data exchange tool between the DNO and HNOs would only arise under very specific, currently unvalidated conditions. The focus has shifted to the CCST, which addresses more immediate and broadly validated needs.
- **Enhanced Stakeholder Engagement for Digital Tools:** The Beta Phase featured a significant enhancement in stakeholder engagement, particularly for the digital tools. Multiple workshops, surveys, and direct engagement with HNOs, DNOs, local authorities, and developers were conducted to ensure the tools are aligned with real-world requirements and to validate the business case.
- **Updated Business Case and Commercial Arrangements:** After the first iteration of the business case and commercial arrangements, the project incorporated updated data and insights on system benefits, funding gaps, and commercial viability. This iterative approach has allowed the project to refine its value proposition and commercial models based on emerging evidence and stakeholder feedback.

To advance commercial readiness in the first year, the project focused on the following actions:

- Engaged stakeholders through workshops, surveys, and bilateral meetings to validate the solution's value and market fit.
- Updated the business case and commercial arrangements using new data and feedback.
- Shared interim findings at industry events and through regular communications to build market awareness.
- Initiated early engagement with Equipment Manufacturers and supply chain partners to prepare for future procurement and scale-up.

Procurement and Utilisation Plans

- **Supply Chain Engagement and Risk Management:** Engagement with suppliers and manufacturers has been brought forward to address long lead times and supply chain risks, ensuring readiness for asset deployment in the Trials. Early procurement of critical assets is now aligned with market realities.
- **Modular and Replicable Frameworks:** Technical and commercial solutions are designed to be modular and replicable, tested across three representative archetypes. This supports adoption by other networks across GB and provides a blueprint for international replication.

Commercialisation considerations

- **Commercial Offer:** The Heatropolis solution is a framework, not a single product, which will provide guidance and validate methods for designing and delivering decarbonised heat networks.
- **Supply Chain Readiness:** Early engagement with suppliers, identification of long-lead items, and proactive procurement planning are in place to ensure the supply chain can support scale-up.
- **Operational Change:** The solution is structured for integration into existing operations, with plans for business change and a route to embed learning into technical standards, supporting consistency across the heat sector.
- **Value Proposition:** The consortium has defined a clear value proposition through optimised, decarbonised heat networks that maintain reliable heat delivery and carbon benefits aligned with Net Zero commitments for investors, developers and local authorities.
- **Scalability and Replicability:** The approach is modular and designed to be replicated across GB and internationally, with knowledge sharing and stakeholder engagement built in.

Non-Network Partner Support

The project is providing support for non-network partners (HNOs, technology providers, software developers, and consultancies) through:

- **Knowledge Sharing:** Regular engagement to share learning about user needs and market requirements.
- **Solution Development:** Collaborative development approach ensuring partners can build complementary capabilities.
- **Market Access:** Facilitating direct engagement between

The post-Beta Phase roadmap is available in [Appendix 2](#).

7. Policy, Regulatory and Standard Barriers

The regulatory and policy environment for heat networks is rapidly evolving, with new requirements on the horizon that will affect customer protection, technical standards, and market access. Heatropolis is proactively engaging with these developments, and while currently there is no need for derogations, successful deployment in the future may require derogations or changes to existing frameworks — particularly as Ofgem regulation, the Heat Network Technical Assurance Scheme (HNTAS), and ED3 methodologies come into force, and as heat network zoning is implemented.

During the Beta Phase, Heatropolis has identified several key regulatory, policy, and standards barriers and opportunities to enable successful deployment and scaling of the innovation:

Ofgem Regulation of Heat Networks

Ofgem is expected to begin full regulation of heat networks in GB from 2026, focusing on customer service, reliability of supply, transparent billing, and fair pricing. Some elements, such as consumer advocacy and complaints handling, will be introduced earlier (April 2025). The evolving regulatory landscape introduces uncertainty for project partners and may require adaptation of commercial models and customer engagement processes to ensure compliance with new requirements as they are phased in.

Heat Network Technical Assurance Scheme

The HNTAS, due to launch in 2026, will establish governance, procedures, and standards to ensure minimum performance and reliability for heat networks. Its objectives include good consumer outcomes, lower costs, enhanced reliability, and lower carbon emissions. The scheme's principles — outcomes-oriented, preventative, proportionate, deliverable, adaptable, and enforceable — will likely require Heatropolis to demonstrate compliance with new technical standards and may necessitate updates to system design, monitoring, and reporting.

Heat Network Zoning

New zoning regulations will mandate certain buildings within designated zones to connect to heat networks within prescribed timeframes. This policy is still under development, with a new Heat Network Zoning Authority and local Zone Coordinators to oversee implementation and enforcement. The methodology for identifying zones and setting national standards is ongoing, and the final requirements may impact the rollout and commercial viability of Heatropolis solutions.

Ongoing Consultations and Policy Development

Several consultations are underway or planned, including:

- **Fair pricing protections** (Ofgem, April–July 2025, now closed)
- **Enforcement guidelines and penalty policy** (Ofgem, August–October 2025, now closed)
- **Authorisation conditions and financial failure mitigation** (Ofgem, August–September 2025, now closed)
- **HNTAS technical standards consultation** (November 2025)
- **ED3 Sector-Specific Methodology Consultation** (Ofgem, ongoing): This consultation sets out proposals for electricity distribution price control, including flexibility valuation, resilience metrics, and cost assessment. Outcomes may influence how Heatropolis integrates flexibility services and interacts with DNO frameworks.

While some of these are outside the immediate scope of Heatropolis, the project is monitoring developments — particularly for any mention of flexibility or technical standards that could affect the solution. The team will review and respond to relevant consultations as needed.

Lastly, Heatropolis has been highlighted in the Clean Flexibility Roadmap from DESNZ, Ofgem, and NESO as a strategically important project, underlining the need for regulatory and policy alignment to support its commercial framework and sector-wide adoption. We are planning to engage with DESNZ to share learnings between our organisations and understand align with their strategic thinking on this topic.

8. User Needs

The primary users prioritised by the Heatropolis project are:

- **Heat Network Developers and Operators:** Responsible for designing, building, and operating heat networks, with a need for streamlined, cost-effective, and scalable solutions for electrification and flexibility.
- **Distribution Network Operator Flexibility and Connections Teams:** Require better coordination with HNOs to manage network capacity, enable flexible connections, and avoid unnecessary reinforcement.
- **Local Authorities and Consultants:** Involved in planning, permitting, and supporting the rollout of low-carbon heat networks, often acting on behalf of communities or as intermediaries.
- **End Consumers (domestic and commercial):** Indirect beneficiaries, with needs for reliable, affordable, and sustainable heating.

The Heatropolis project has adopted a dual-stream approach to user needs, reflecting both the complexity of the decarbonisation challenge and the diversity of stakeholders involved. On one hand, the project is developing the Heatropolis framework — a comprehensive set of commercial, technical, and operational models to enable flexible, low-carbon heat networks at scale. In parallel, the project is delivering a digital solution designed to streamline and accelerate the process of connecting heat networks to the electricity grid. While these streams are distinct in their outputs, they serve a largely overlapping set of users, and insights from each stream are mutually reinforcing. This approach ensures that both the strategic (framework-level) and practical (tool-level) needs of users are addressed in a coherent and integrated manner.

User journey

For the Heatropolis framework:

The user journey is iterative and collaborative. Users are engaged from the outset through workshops, interviews, and co-design sessions. As the project progresses, selected users participate in live Trials, providing feedback on commercial models, operational processes, and technical solutions. Insights from these engagements and Trials are used to refine the framework, ensuring it is practical, scalable, and addresses real-world barriers. The final framework will offer a clear, evidence-based pathway for future projects, reducing uncertainty and risk for all stakeholders.

For the digital solution:

At a high level, the user journey for the digital solution is centred on supporting new connection requests for heat networks, providing users — such as HNOs, local authorities, consultants, and developers — with improved visibility of available options and requirements for decarbonising their networks.

It is important to note that the user journey is currently under active development. The design and functionality of the digital solution are being iteratively refined based on ongoing engagement and feedback from users. This approach ensures that the final user experience will be closely aligned with real-world needs and expectations and will continue to evolve as further insights are gathered throughout the project.

Translating User Needs into project design and requirements

User needs are systematically captured through direct engagement, structured feedback, and analysis of operational pain points.

For the Heatropolis framework, these needs are translated into requirements for commercial models, technical design, and regulatory recommendations.

For the digital solution, user feedback directly informs the tool's development and interface ensuring that the tool will be addressing the user needs.

Improving understanding of User Needs

The project's understanding of user needs has evolved significantly, underpinned by a dedicated WP focused on stakeholder engagement.

Over the first year, this approach has enabled the team to engage extensively with a wide range of stakeholders — HNOs, consultants, and developers — providing a richer and more nuanced understanding of their requirements.

Through ongoing engagement activities, early assumptions have been challenged and refined, particularly in relation to the connection process enhancements and the commercial barriers faced by HNOs.

Connection Process Enhancements

- Users want early visibility of network capacity to plan decarbonisation strategies effectively.
- Users want the ability to navigate complex applications, such as non-firm connections, through streamlined and self-service tools.
- There is a need for clearer upfront cost information and technical options to support planning and investment decisions.
- Current processes often involve multiple applications for optioneering, which users would prefer to consolidate into a single, simplified journey.

Commercial Barriers faced by the HNOs

Under current market and regulatory conditions, the business case for HNOs remains commercially constrained without additional revenue streams or funding support mechanisms. DNO flexibility payments, as presently structured, provide only limited improvement to the overall business case. This suggests a need to explore:

- New commercial models that recognise the value of flexibility and enable cost recovery for additional infrastructure.
- Policy and market developments that enable benefits from flexibility and decarbonisation to be realised across the sector.
- Mechanisms to redistribute the value generated and bridge the investment gap, ensuring operators can deploy the technologies required for low-carbon heat without disproportionate financial risk.

By involving a diverse spectrum of users, from large urban networks to smaller community schemes, the project has ensured that both the Heatropolis framework and the digital tool remain relevant, inclusive, and responsive to the evolving needs of the sector.

Testing assumptions against User Needs

Assumptions are rigorously tested through a structured program of three iterative Trials conducted over the duration of the project. Between each Trial, the project team systematically captures and analyses lessons learned, using this feedback to inform and refine the design of subsequent Trials.

This approach ensures that each phase of the project is directly shaped by real-world user experience and stakeholder input, rather than relying solely on theoretical models.

This iterative methodology enables the project to validate its direction, make evidence-based adjustments, and deliver outcomes that are both practical and responsive to the evolving needs of its users.

Minimising User burden and avoiding duplication

During the project's first year, we ensured that our approach minimises user burden and avoids duplication by:

- Initiating the design of the Heatropolis framework and digital tool with the aim to integrate with existing processes and data sources, so users do not need to duplicate data entry or adapt to entirely new workflows.
- Scoping the digital tool to simplify the connection process for HNOs and their partners, reducing complexity in accessing flexibility services.
- Carrying out Primary Research to understand end user requirements, ensuring Trials reflect real operational needs and avoid unnecessary steps.
- Engaging early with NESO and other networks to align processes and avoid duplicating analysis across industry initiatives.
- Performing an annual Horizon Scan to gather any related learnings and integrate them into our approach where applicable.

9. Impacts and Benefits

Project progress towards benefits

Since the Beta Phase application, where the project developed its initial CBA, the project team has refined this analysis and undertaken substantial work to refining inputs and deepening the evidence base for benefits to a range of stakeholders. This includes:

- **Comprehensive Trial design and delivery planning** for three archetypes (large mixed-use, medium residential estate, small multi-occupancy), forming the basis for scaling up results across UK Power Networks and GB.
- **Development of commercial arrangements and business models**, including quantification of HNO funding gap and the exploration of new commercial mechanisms to unlock flexibility from electrified heat networks.
- **Stakeholder engagement** with HNOs, NESO, and regulatory bodies to define telemetry requirements, flexibility routes to market, and to inform the design of incentives and support mechanisms.
- **Consumer engagement planning** to ensure that the benefits and learnings from Trials can be translated into scalable, consumer-friendly deployment models.

This work has positioned the project to validate and, where possible, enhance the benefits outlined in the Beta Phase application, with future iterations of the business case set to incorporate live Trial data as it becomes available.

Changes to proposed impacts

Since the Application stage, several refinements have been made to the business case:

- **Stakeholder benefits** for DESNZ and end consumers have been analysed and added to the business case (which only considered DNOs, HNOs and the environment in Alpha Phase), providing a more complete picture of the system wide benefits and enabling the quantification of the benefits to the whole GB energy system.
- **Adoption profiles** have been updated to reflect phased rollout, supply-chain lead times, and more realistic uptake scenarios (low, medium, high), with the core scenario assuming medium adoption (100% by 2045).
- **Cost assumptions** have been stress-tested with vendors and HNOs, and sensitivities have been widened to reflect integration complexity and market variability.
- **Scenario inputs** have been refreshed using the latest Distributed Future Energy Scenarios (DFES), new modelling from project partner Metropolitan, and engagement insights from NESO about Capacity Market benefits.

These refinements do not alter the fundamental conclusion that consumer value is driven by avoided reinforcement, operational efficiency, reduced emissions and system balancing benefits. Instead, they provide greater confidence in the timing and scale of these benefits.

Developments Affecting Benefits

- **Regulatory evolution** (e.g., Ofgem's Heat Network Regulation) and flexibility market developments may enhance monetisation opportunities for HNOs and accelerate consumer benefits.
- **Integration complexity** and the need for interoperability between heat network controls and flexibility platforms may influence delivery timelines, but not the overall benefit potential.
- **Data readiness** (telemetry and secure data exchange) remains a critical enabler for measuring and realising benefits during the Beta Phase and beyond.

Additional Impacts Identified

- **Improved connection pathways** (e.g., profiled connections) enabling faster, lower-cost electrification of heat networks.
- **Digital planning and forecasting tools** to optimise connection sizing and siting decisions.
- **Consumer engagement insights** that will inform scalable deployment and billing models.

Issues or Problems Discovered

During the refinement of the business case and the development of commercial arrangements, the project has encountered several challenges that are being actively addressed.

One of the most significant issues is that, under current market and regulatory conditions, the business case for HNOs remains commercially unviable without additional revenue streams or funding support mechanisms. Flexibility payments, as presently structured, provide only limited improvement to the overall business case. This highlights the need for new commercial models and regulatory interventions to ensure that the benefits of flexibility and decarbonisation can be fully realised and shared with consumers.

These issues are being addressed through ongoing technical design refinements, stakeholder engagement, and the development of innovative commercial solutions, with the aim of ensuring that the Trials and subsequent rollout can robustly deliver the intended consumer and system benefits.

Estimated Future Value to Customers

The updated CBA confirms substantial long-term value, pending Beta Phase validation:

- **Whole system benefits by 2050 (GB-wide):** £3.2 billion (discounted, real 2025 GBP), with £2.3 billion accruing to energy consumers and £1.8 billion to the environment.
- **Consumer benefits are primarily indirect:** £2.2 billion in bill savings passed through from DESNZ's reduced need to charge consumers for Capacity Market procurement, and £60m from DNOs due to avoided DUoS charges.
- **Environmental benefits:** 6.6 Mt CO₂e emissions avoided by 2050, primarily from accelerated displacement of gas-fired heating and avoided reinforcement.
- **Break-even for consumers:** The business case demonstrates that, if the HNO funding gap of £0.8 billion is resolved, the system delivers a positive multiplier effect and substantial net benefits to consumers.

The magnitude of benefits to consumers will ultimately depend on the achieved reduction in peak demand, cost to unlock flexibility, adoption speed, and future energy scenarios — all of which the Beta Trials are designed to test and validate. Future iterations of the business case will incorporate live Trial data, replacing assumptions with verified evidence and further refining the scale and timing of consumer benefits.

10. Risks, Issues, and Constraints

The project actively captures risks, issues, and dependencies through a comprehensive RAID (Risks, Assumptions, Issues, Dependencies) log, which is reviewed regularly to ensure timely mitigation and informed decision-making. This structured approach enables proactive management of challenges and supports alignment with project objectives.

During the first year of the Beta Phase, the project has identified several challenges across three key areas:

1. **Regulatory Landscape** – navigating evolving compliance requirements.
2. **Contractual and Site Engagement** – securing Trial sites.
3. **Technology and Delivery** – addressing design, procurement, installation, and data integration complexities.

More specifically:

Regulatory Landscape		
The risk: The regulatory and policy environment for heat networks is rapidly evolving, with new requirements on the horizon that will affect customer protection, technical standards, and market access. Heatropolis is closely monitoring these developments to ensure ongoing alignment. While no adjustments are required at present, certain delivery elements of the project may need to be updated in future phases as Ofgem regulation, HNTAS standards, ED3 methodologies, and heat-network zoning are rolled out. A detailed assessment of these regulatory and policy considerations is included in Section 7. Policy, Regulatory and Standard Barriers.	The impact: - Emerging regulatory, policy, and technical requirements may require adjustments to elements of the Heatropolis solution — such as system design, monitoring, reporting, commercial models, or customer engagement — to ensure ongoing alignment as new standards are introduced. - Uncertainty in the timing and content of forthcoming regulation (including heat network regulations, technical assurance standards, zoning policy, and electricity distribution methodologies) may affect partner planning and introduce delivery risks if requirements evolve during the project. - Misalignment with future regulation could result in delays, additional redesign, or reduced readiness for BaU adoption. - Changes to market access, compliance obligations, or flexibility valuation frameworks could influence commercial viability and scaling potential for Heatropolis in future phases.	The mitigation: Active Monitoring: Continuously tracking regulatory and policy developments across heat network regulations, technical standards, zoning policy, and electricity distribution methodologies to ensure early visibility of emerging requirements and assess their impact. Targeted Engagement: Heatropolis maintains active dialogue with relevant bodies — including ongoing engagement with the NESO on commercial arrangements and the business case. In addition, participation in Ofgem and ADE forums to stay aligned with sector expectations, and lastly, plans to engage with regulators as needed and contribute to consultations or regulatory discussions if future project needs require it. Adaptive Delivery Planning: Heatropolis' flexible delivery structure (including annual updates to commercial models and business cases, and three iterative Trials) will be leveraged to accommodate adjustments arising from new standards or regulatory changes with minimal disruption. Cross-Industry Alignment: Planned coordination with Ofgem, the DESNZ, NESO, and wider industry groups to ensure that Heatropolis outputs remain

		compatible with emerging frameworks and sector-wide guidance. • Partner Readiness: Leverage the project consortium structure to ensure regulatory updates and their implications are regularly shared, enabling all partners to maintain commercial, technical, and operational readiness.
Contractual Agreements and Site Engagement		
The risk: The Trials and their participating sites are essential to the Heatropolis project, as they provide the real-world settings needed to generate learning across different heat network archetypes. To deliver these Trials, formal agreements must be secured from site owners. This process has proven challenging, as it requires navigating complex legal, commercial, technical, and organisational considerations—particularly for certain building types where engagement often involves non-technical constraints, resource limitations, funding considerations, and tight timelines.	The impact: • Delays in Trial delivery and installation activities. • Limited ability to collect baseline and operational data required for modelling and validation. • Reduced opportunity to test commercial arrangements and inform the business case. • Procurement sequencing disrupted due to uncertainty in site readiness. • Potential need to adjust scope or timelines to maintain learning objectives.	The mitigation: • Confirmed Sites: Archetypes 1 and 2 have been fully confirmed for participation, with the necessary arrangements in place to support their involvement. • Mitigation for Outstanding Site: For Archetype 3, a mitigation plan is active — baseline data for Trial 1 will be collected through a surrogate, non-decarbonised site to preserve learning objectives. • Continued Engagement: Continued engagement with site owners, local authorities, and housing associations to secure an Archetype 3 site for Trial 2.
Technology and Delivery		
Procurement and Installation of Technical Equipment		
The risk: There is a risk that the installation and commissioning of technical equipment required for the Trials may not be completed in line with project timelines. Delivering new assets across diverse building types — each with different legacy systems, planning requirements, and procurement pathways — introduces dependencies on external contractors, supply-chain readiness, design development, and site-specific constraints. These factors may affect the readiness of key technologies ahead of the Trial phases.	The impact: • Reduced ability to fully test planned technical and commercial arrangements (e.g., flexibility enabled by thermal storage or heat pumps). • Trial phasing may need to be adapted to reflect asset availability, potentially limiting the scope of the Trials. • Lower customer volumes or shorter operational windows could reduce the robustness of Trial evidence. • Demonstration of electrical-asset performance may be deferred or	The mitigation: • Phased Trial Setup: The project has developed a modular Trial plan that allows phased or partial integration of assets while still generating meaningful insights. • Early Feasibility & Design Validation: We are conducting early feasibility assessments to identify planning requirements, infrastructure upgrades, and design dependencies for Trial 2. • Coordinated Procurement Planning: Align procurement timelines with confirmed site readiness to reduce stranded

	replaced with modelled data where installation is delayed.	equipment risk and adapt sequencing where needed. • Close Partner Coordination: Maintain regular coordination with site owners, contractors, and technology suppliers to track progress, resolve constraints, and accelerate decision points. • Contingency Approaches: Where necessary, we have planned to use interim solutions (e.g., modelled performance, surrogate data) to maintain learnings even if physical asset installation is delayed.
Data Collection and Modelling Complexities		
The risk: The project requires multiple datasets to be generated, shared, and integrated in parallel across WPs. This includes historic data from partners, new data produced through project modelling, upcoming Trial outputs, and information gathered from external stakeholders. Dependencies between WPs mean that key analyses — such as commercial arrangements, technical modelling, and business case development — rely on datasets that are still being produced, creating complexity in timing, alignment, and integration.	The impact: • Delays or gaps in key datasets may affect the ability to progress modelling, commercial analysis, and technical validation at planned times. • Data arriving at different levels of completeness or quality may require additional processing or assumptions, reducing confidence in early modelling outputs. • Dependencies between WPs may introduce bottlenecks if upstream data is not available when required. • Business-case and whole-system valuation may rely on interim or proxy data until Trial evidence becomes available.	The mitigation: • Early Data Need Identification: Map data needs and cross-WP dependencies early, maintaining a shared schedule for expected dataset delivery. • Regular Coordination: The project is holding regular cross-WP coordination sessions to ensure timely data sharing, clarify gaps, and resolve dependencies. • Interim Approaches: Using modelled or surrogate datasets where appropriate to maintain progress while awaiting later-stage or Trial-generated data. • Transparent Assumptions: Document assumptions and data limitations to ensure downstream analyses remain transparent and well-contextualised. • Data Management Plan: This plan will be produced for Trial 1 and reviewed before every Trial to ensure the right data is being collected, in the right place and format to enable the necessary analysis can be carried out by all WPs

Adaptation of Project Outcomes to Meet User Needs

Despite regulatory uncertainty, site onboarding challenges, and technical dependencies, Heatropolis has adapted its approach to maintain user-centric outcomes and project objectives:

- **Surrogate Site Strategy:** Where site onboarding delays occurred, the project implemented a surrogate site approach to ensure baseline data collection and ensure learning objectives.
- **Flexible Trial Design:** Trials have been structured to allow phased integration of assets, enabling meaningful insights even when full installations of decarbonised assets were not immediately possible.
- **Scenario-Based Modelling:** Interim datasets from industry standard models and sensitivity analysis were used to progress commercial modelling and business case development while awaiting Trial-generated data.

11. Working in the Open

Heatropolis has embedded transparency and stakeholder engagement throughout the Beta Phase, ensuring that progress, learnings, challenges, and outputs are shared openly with the sector. The project has used a combination of structured engagement, open dissemination, and collaborative partnerships to promote the project, invite external challenge, and support wider industry learning.

Public Communication Methods

- **Project website and Innovation Portals:**

Heatropolis maintains a dedicated project page on the [UK Power Networks Innovation website](#), where updates, published reports, and event information are shared. The project is also listed on the [ENA Smarter Networks Innovation Portal](#), ensuring visibility across the GB energy sector. During this reporting period, the team has published the first Horizon Scan.

- **Events, Webinars, and Conferences:**

The team regularly presents at major industry events (e.g., Energy Innovation Summit, Utility Week), hosts webinars after each Trial phase, and participates in sector forums to share progress and invite discussion. Throughout this reporting period, Heatropolis presented at a wide set of events including the Anglo-Swedish Heating Days and the Decentralised Energy Conference as well as attended the Energy Innovation Summit and Utility Week Live.

- **Newsletters and social media:**

Regular newsletters are planned to update stakeholders, and key milestones are shared via UK Power Networks' social media channels and partner communications.

Collaboration with Stakeholders and Inviting Challenge and External Input

A dedicated WP ensures systematic engagement with HNOs, consultants, developers, local authorities, and other networks. Throughout this reporting period, collaboration has been delivered through workshops, interviews, introductory meetings, and participation in key industry events.

In the first months of the project, key internal and external stakeholders were identified, and a stakeholder engagement plan was developed to guide outreach, communication and dissemination. This plan was the basis of our dissemination activities in Year 1. During Year 1, the main dissemination activities have included:

- **Targeted meetings and workshops** with HNOs, NESO, local authorities, social housing providers, and DNOs have collected feedback from HNOs relevant to WP5 and NESO relevant to WP2.
- **Presenting at industry events and conferences**, where UK Power Networks and project partners presented Heatropolis updates, strategic insights, and emerging findings. Engagements have included:
 - Industry events such as Utility Week Live, Decentralised Energy Conference and the Energy Innovation Summit.
 - Forums such as ADE Heat Network Forum and the Decentralised Energy Practitioners Group.
 - Events such as the Anglo-Swedish Heating Days.
- **External communication channels**, including the Heatropolis website has supported wider dissemination of project materials, such as publishing the first Horizon Scan. We additionally plan to share updates through a newsletter to stakeholders we have initiated engagement with to maintain engagement.

One example of wider knowledge sharing is the project launch event, which served as a platform to engage stakeholders and build momentum. Looking ahead to Year 2, we plan to disseminate learnings following the first Trial to share findings and provide ongoing updates to stakeholders.

Sharing Learnings and Avoiding Duplication

Key findings, lessons learned, and best practices are published openly and shared with other networks and industry bodies. This includes interim and final reports, presentations, and technical documentation. In addition, the project actively collaborates with other innovation initiatives to align approaches, share data, and avoid duplication of effort, accelerating progress across the sector.

During this reporting period, the project has proactively shared emerging learnings and coordinated with other initiatives to avoid duplication of effort across the sector. This has included publishing early materials, presenting interim insights at industry forums, and engaging directly with organisations working on related innovation programmes.

Activities undertaken during this period include:

- **Publishing early reports and materials**, making these accessible to other networks, suppliers, and developers.
- **Presentations of interim findings at events** were used to share early design decisions for the Beta Phase, including Trial strategy, digital-tool concepts, and commercial considerations.
- **The Project Launch Event**, which provided a platform to present project objectives, planned Trial activities, and early findings to DNOs, and wider stakeholders, helping others align their ongoing programmes with the Heatropolis approach.
- **Engagement with related innovation initiatives** included participating to the GeoGrid SIF Alpha Phase dissemination forum to compare methods on heat-network data, flexibility and planning, and holding an alignment meeting with Project PRIDE (SIF Beta Phase) to identify overlaps in digital workflows and data-exchange requirements. We also participated in the UK Power Networks' Net Zero Networks event to connect with other innovation projects and share interim learnings.

Building Relationships Across the User Journey

- **Engagement with Infrastructure and Data Owners:**
The team works with DNOs, HNOs, and data providers to ensure interoperability and data sharing.
- **Regulators, Policymakers, and Investors:**
Ongoing dialogue with Ofgem, NESO, local authorities, DNO regulatory teams ensures that regulatory, policy, and commercial perspectives are integrated into project design and delivery.
- **Cross-Project Collaboration:**
Relationships are built with teams responsible for related initiatives, enabling a joined-up approach to decarbonisation and digitalisation.

Insights from Stakeholder Engagement

- **Refined Understanding of User Needs:**
Engagement has highlighted the importance of clear commercial models, streamlined digital processes, and practical support for smaller and less-resourced networks.
- **Iterative Design:**
Feedback from stakeholders has directly informed the iterative design of both the Heatropolis framework and the digital tool, ensuring solutions are grounded in real-world needs.
- **Sector-Wide Impact:**
The open approach has fostered a culture of shared learning, with several external networks expressing interest in Trial learning and adopting the Heatropolis approach.

Heatropolis is committed to working in the open, with transparency and stakeholder engagement embedded throughout the Beta Phase. By combining proactive communication, structured collaboration, and open knowledge sharing, the project is accelerating progress not just within UK Power Networks, but across the wider energy sector.

12. Costs and Value for Money

Value for money for consumers

The Heatropolis Beta Phase is forecasted to cost **£11,798,614**, with a total SIF funding request of **£9,743,620**. This demonstrates strong partner commitment and ensures value for money for consumers through significant private contributions and efficient resource allocation. Partner contributions exceed the minimum requirement, with a combined contribution of **17.42%**, highlighting market confidence and shared risk ownership.

How the project delivers value for money

Heatropolis Beta Phase delivers value for money by:

- **Leveraging Existing Investments:** UK Power Networks builds on existing digital tools reducing duplication and accelerating delivery.
- **Accelerating Decarbonisation:** Metropolitan commits to bringing forward its decarbonisation plan for King's Cross by five years, leveraging multimillion-pound infrastructure investments.
- **Technical Expertise and IP:** Passiv UK contributes prior knowledge and IP in smart control systems, supported by specialist subcontractor NODA for international best practice.
- **Stage Gate Governance:** Three critical decision points ensure scope refinement and cost control, preventing overspend and optimizing consumer benefit.
- **Avoiding BaU Limitations:** Without SIF funding, innovations such as commercial frameworks and end-to-end technical integration would not proceed, delaying cost-efficient Net Zero transition.

Variations to spend

The Heatropolis Beta Phase is delivering strong value for money to consumers by focusing on cost-effective integration of heat networks with electricity systems, reducing reinforcement costs, and improving customer engagement. The project remains 10% below forecasted spend as of the latest reporting period, reflecting the Impact assessment and conceptual design for the digital customer tool deliverable being shifted by approximately six months, due to the project decision to expand the engagement with stakeholders.

Unspent SIF Funding and Additional Funding

No confirmed unspent funding at this stage. Any residual funds at phase close will be returned to consumers in line with SIF governance.

No additional funding beyond the Project Direction has been introduced. Any such contributions would be treated as Disallowed Expenditure under Ofgem rules.

Revenues earned returned to consumers

The project has not generated any revenues to date. Should revenues arise, they will be returned to consumers as per the Funding Return Mechanism.

Project expenditure by each Project Partner

Project Partner name	SIF funding requested (£)	Total project costs (£)	Project Contribution (£)
UK Power Networks	£2,580,077	£2,866,753	£286,676
Guidehouse Europe Limited	£1,965,108	£2,183,454	£218,346
Metropolitan Infrastructure Limited	£2,813,365	£3,970,850	£1,157,485
Passiv UK Limited	£2,385,070	£2,777,557	£392,487
Total	£9,743,620	£11,798,614	£2,054,994

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13. Special Conditions

Describe how you have met any requirements of any project specific conditions set out in the Project Direction.

Condition	Details	Status
1- Funding	The Funding Party must not spend any SIF Funding until contracts are signed with the Project Partners named in Table 1 for the purpose of completing the Project.	Heatropolis Beta Phase Collaboration Agreement has been signed as of 02/04/2025. The project has not spent any SIF Funding prior to this date. Condition is satisfied.
2- Financial contribution	The Funding Party must report on the financial contributions made to the Project as set out in its application. Any financial contributions made over and above that stated in its Application should also be reported and included within the Project costs template.	Condition is satisfied. Project spend is being reported quarterly: Gross detailed amounts (SIF Funding + Contribution) in the UKRI template. Summary presented during the Quarterly Monitoring Meetings.
3- Meeting arrangements	The Funding Party must participate in all meetings related to the Project that they are invited to by Ofgem, UKRI and DESNZ during the Beta Phase.	Condition is satisfied. The Funding Party has participated in all meeting related to the project that has been invited to.
4- Stage gate scoping	The Funding Party must, with support from Innovate UK/UKRI and, where applicable Ofgem, scope the requirements and success criteria for each stage gate, as set out in the project management plan within a Project at the quarterly reporting meetings ahead of any stage gate. These will be used to determine what criteria a Project must meet in order to pass a stage gate, and whether any additional information, such as a report, must be produced as part of the stage gate.	Condition is satisfied. Success Criteria for Stage gate 1 have been agreed with UKRI as per the condition guidance. High level criteria for Stage gate 2 and stage gate 3 to be agreed.
5- Impact monitoring	As part of the end of Project Phase report, the Funding Party must produce a Project Impact Monitoring and Evaluation Plan. This plan must outline how the Project plans to monitor and evaluate the delivery of benefits outlined in the Beta Phase Application following the end of the Beta Phase. The plan must also include the methodology that will be utilised for quantifying and qualifying benefits realisation and how the Funding Party plans to report this to Ofgem 1-, 3-, 5- & 10-years post-Beta Phase completion. Further details on how to approach the development of	The project aims to define and evaluate the delivery of benefits as part of work planned in WPs 2 & 8. Will be completed as part of the end-of-Project Phase report.

	this plan may be provided by Ofgem or IUK.	
6- SIF Community Forums	The Funding Party and all Project Partners must make reasonable attempts to attend, participate and/or contribute at SIF Community Forum events occurring during the Project delivery. We anticipate there being approximately one event per year.	Condition is satisfied. Funded party attended Ofgem SIF Community Forum in Edinburgh on 04/03/2025.
7- Policy, regulatory and standards barriers	The Funding Party must provide verbal updates at each quarterly meeting on any regulatory, policy and standards barriers and any change requirements which may impact delivery of the Beta Phase activities. The Funding Party must also include as an attachment to each of its annual progress report an update on any regulatory, policy and standards barriers which may require derogations and articulation of any proposed regulatory, policy and standards change which would be necessary in deployment. The Funding Party must also provide an as an attachment to its end of Project Phase report a summary of the Project's findings on regulatory, policy and standards barriers, including any considerations for future work, and where applicable, where specific regulatory, policy and standards changes would be required for deployment.	Condition is satisfied. The project has incorporated the updates as part of the quarterly review meetings with the monitoring team. An update is provided in Section 7. Policy, Regulatory and Standard Barriers of this report.
8- Updated 60-second videos	The Funding Party must provide within the first three months of signing contracts with its Project Partners an updated 60-second video. If the Project is greater than two years (longer than 24 months) in length, an updated video must also be provided at the Project's mid-point meeting. All Projects must also provide an updated 60-second video as part of their end of Project phase report. Innovate UK can share its guidance for 60-second videos with the Funding Party, if necessary.	Condition is satisfied. A 60-second video has been submitted to UKRI on 19/03/2025. An updated video is expected in November 2026.
9- Post-Beta Phase roadmap	The Funding Party must provide to the monitoring officer within six months of it signing contracts its Project Partners a roadmap for activities post-Beta Phase. This can build on the Project's Application question (question 11) and	Condition is satisfied. An updated Post-Beta Phase roadmap was shared in the latest quarterly review meeting. Updated roadmaps will be shared in every two quarterly monitoring meetings.

	must focus on how and when the proposed solution will become business as usual within your network and across the other GB gas or electricity networks. As part of this, the Funding Party must include consideration for: I. any steps the Project will take to ensure its innovation has suitable BaU adoption. II. the Funding Party's strategy for adoption of the innovation or proposed solution, giving consideration to potential investment, ongoing costs and third-party involvement and. III. any early indication of interest from other networks in adopting the innovation. The Funding Party must provide an update on all the above at every two quarterly monitoring meetings (i.e. every six months) and must include a final update of this roadmap as attachment to its end of Project Phase report.	A final attachment will be included as part of the end-of-Project Phase report.
10- Commercialisation strategy	The Funding Party must provide at every second quarterly monitoring meeting (i.e. every six months) an update on its commercialisation strategy. This can build on the Project's Application question (question 12) and must focus on what considerations have the Project consortium made for the commercialisation of the proposed solution or innovation, and how the Project provides support for non-network partners to move towards commercialisation. As part of this, the Funding Party may wish to include consideration for: I. who the primary customer segment is beyond the Funding Party; the customer value proposition;	Condition is satisfied. An updated commercialisation strategy was shared in the latest quarterly review meeting. A final attachment will be included as part of the end-of-Project Phase report.

	II. if identified, the outline of the route to market and potential new partnerships; III. any additional Project Partner capital requirements in order to commercialize the innovation and; IV. how this product, process or service could be scaled across the GB network and taken to new markets. The Funding Party must also include a final update of its strategy as an attachment to its end of Project Phase report. Ofgem and/or Innovate UK may issue a template for the final update as part of the end of Project Phase report.	
11- Data Best Practice and Digital Strategy and Action Plan Guidance alignment	The Funding Party must provide at its second monitoring meeting (i.e. quarter one) a summary of how it intends to comply with Ofgem's Data Best Practice Guidance, and Digitalisation Strategy and Action Plan Guidance. Additionally, a part of its year 1 annual progress report, the Funding Party must provide a written update to the monitoring officer on its incorporation and application of data best practices to date in the Project, including its presumed open data policies, and data triaging methodology.	Condition is satisfied. A plan has been created in alignment with UK Power Networks Data team and shared with the Monitoring team. A written update is provided in Appendix 3 of this report. Condition is satisfied.
12- Stakeholder Engagement Plan	As part of stage gate 1 (as set out in the Project Plan), the Project must provide a stakeholder engagement plan detailing how it will engage with and enable other HNOs and smart control providers to participate, as well as how it will engage with and disseminate information to key government bodies, regulators and consumer protection groups (e.g. Heat Trust), and social housing providers or local authorities with significant social housing throughout the Project.	Condition has been included in Stage Gate 1 specific criteria. Condition is satisfied.

14. Material Changes

There have been no material changes in this reporting period. However, the project team and the UKRI monitoring team are in the process of implementing the change below for the following reporting period.

During the Beta Phase, the project refined the scope of WP5 – Digital Customer Tools. The original plan included developing two different digital solutions, the CCST and the CDET.

The latter aimed to enable two-way data exchange between the DNO and HNO. While this exchange could enhance forecasting across flexibility, capacity, and demand, analysis showed that the added value would only occur under very specific conditions that remain unvalidated at this stage. To ensure resources deliver maximum impact, the project decided to focus solely on the CCST. This change improves delivery certainty, prioritises a solution with clear and immediate benefits for customers and aligns with the project's commitment to consumer value and efficient use of funding.

15. Appendix 1. Lessons Learnt

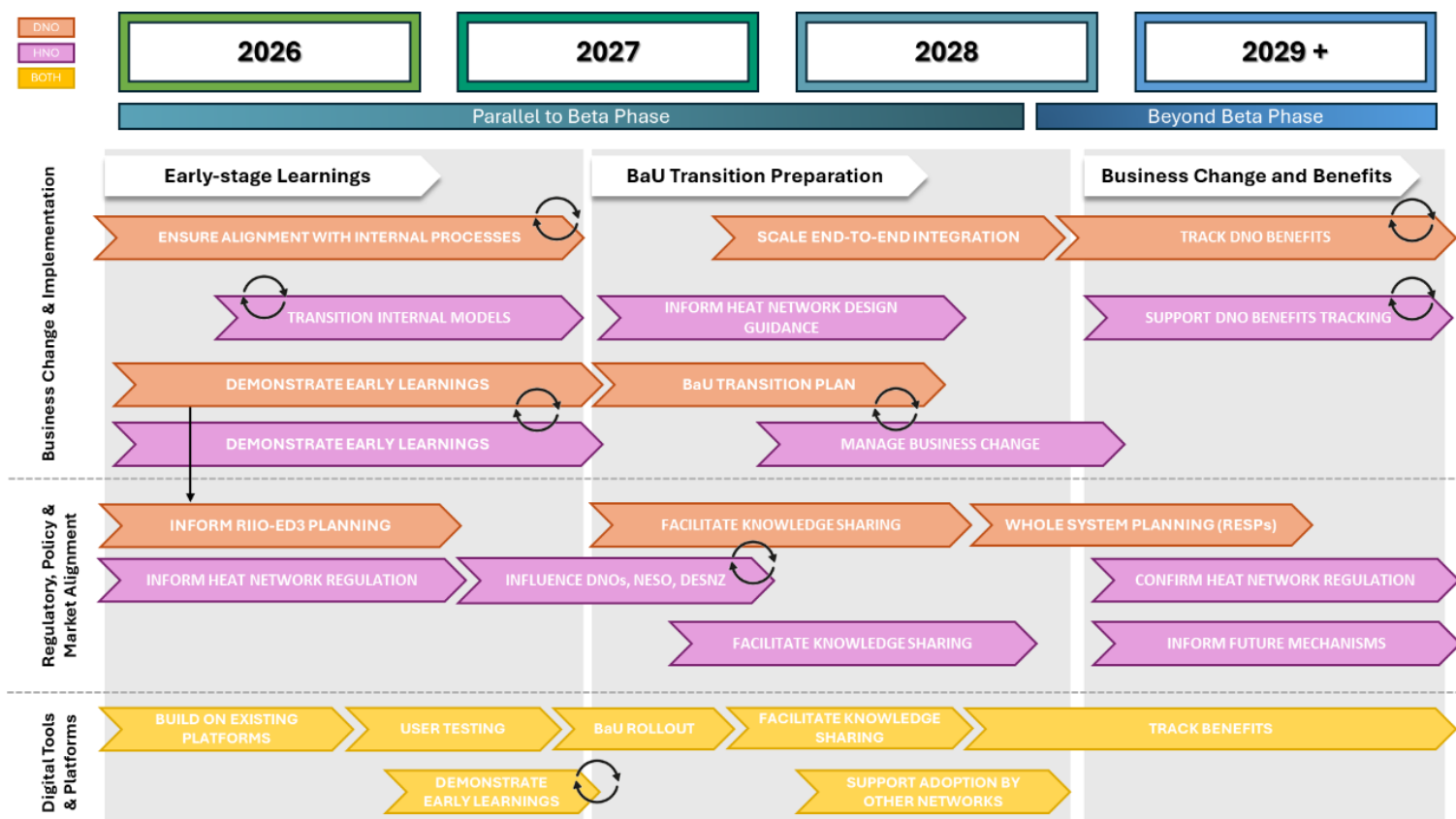
No.	Lesson learnt	Lesson category
1	Cost of Heat Pumps: The capital and operational costs of heat pumps are significantly higher than traditional gas systems, making financial justification challenging.	Costs
2	Resident Acceptance and Control: Residents, particularly those in social housing with a history of pooled systems, desire individual control and autonomy over their heating. They may resist technologies that restrict or alter this control, even if it benefits the grid or efficiency.	Users
3	Transition from Gas to Heat Pumps: Switching from gas to heat pumps can lead to increased power consumption and higher electricity costs, which might be perceived negatively despite being a low carbon solution and there being a reduction in gas bills.	Costs
4	Resident Understanding of New Technology: Many residents may struggle with understanding or operating new heating controls, especially when accustomed to simple on/off systems.	Users
5	Thermal Performance of Existing Buildings: Older buildings, particularly those with solid wall construction and poor insulation, may have varying thermal mass and efficiency, making it difficult to optimise and control heating systems effectively.	Installation
6	Building Safety Act Regulations: The Building Safety Act can cause project delays and complications, particularly for buildings over 18 meters tall, due to lengthy application processes.	Installation
7	Shifting Heat Demand Timing: Attempting to shift heat demand to off-peak hours might be challenging due to residents' desire for heating at specific times and potential discomfort if thermal storage is not accurately calculated	Users
8	Legacy Systems: Retrofitting new technology into existing buildings with legacy systems designed in the 1980s can be difficult due to compatibility and resident expectations.	Installation
9	Space Constraints: A standalone control solution may need to be considered to enhance the overall system's performance if space constraints are a significant limitation as to what LCT's can be installed.	Scope
10	Resident Acceptance: Concerns about aesthetics and disruption, especially for ground-floor residents due to potential external placement.	Users
11	Planning Permission: Adding additional thermal storage/ASHP's to existing designs may likely require inclusion in planning application, potentially causing delays.	Installation
12	User Complexity: Smart controls and apps may be too complex for elderly residents; a simple wall thermostat option is crucial.	Users
13	Hybrid Systems: Some LA/HA have asked the question as to whether hybrid systems may be considered for the project. In some cases, particularly in the context of buildings with poor fabric, hybrids provide a pathway to lower carbon emissions while mitigating some of the challenges associated with full electrification, such as high upfront costs and potential disruption during installation.	Scope
14	Regulatory uncertainty around heat networks is causing delays as organisations await new standards.	Process

15	Buildings with HIUs can narrow the search for suitable sites. Many legacy sites have direct feed to radiators and no potential for domestic control of HIU's.	Process
16	Tenant resistance to low-temperature systems, as they are accustomed to hot radiators, can lead to customer dissatisfaction.	End User
17	Education: The sector is under-resourced in staff with expertise.	Stakeholders
18	Site drawings/plans not available: We have found that some work is offered on a design and build agreement. Drawings only available once work awarded.	Process
19	Warranties and existing funding can be negated by installing additional measures to existing system designs.	Installation

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16. Appendix 2. Heatropolis Post-Beta Phase Roadmap



17. Appendix 3. Ofgem's Data Best Practice Alignment

Introduction

This document sets out Heatropolis Beta Phase's alignment with the [Ofgem Data Best Practice \(DBP\) guidance](#). It provides a structured response to each of the eleven DBP principles, demonstrating how the project has interpreted and implemented the guidance through its data governance and operational practices. Our approach ensures that all project data is handled transparently, securely, and in a way that maximizes value for stakeholders and supports innovation.

While UK Power Networks provides an annual organisation-wide response to the DBP guidance through its Open Data Portal, which includes a scored self-assessment, this document is distinct. It focuses solely on how the Heatropolis Beta Phase project aligns with the DBP principles, offering a project-level view of compliance and implementation.

From the outset, the project has adopted a robust Data Management Plan (DMP) that aligns with Ofgem's 11 Data Best Practice principles. The DMP covers all aspects of data collection, storage, sharing, retention, and governance, and is regularly reviewed and updated to reflect feedback and evolving requirements.

Alignment with Ofgem's 11 Data Best Practice Principles

To provide a clear overview, the following executive summary table highlights how Heatropolis Beta Phase meets each of the Ofgem Data Best Practice principles.

Ofgem DBP Principle	Alignment	Heatropolis Alignment
1. Identify roles of stakeholders of Data Assets	Full	Roles and responsibilities for each data source and archetype are clearly defined and documented in the DMP. UK Power Networks, Metropolitan, Passiv, Guidehouse, and other partners have explicit accountabilities for data collection, validation, and sharing
2. Use common terms (standard vocabulary)	Full	Consistent terminology is maintained through a comprehensive data dictionary and glossary to ensure clarity for all partners and future users.
3. Describe data accurately with standard metadata	Full	All datasets are accompanied by standardised metadata, including source, timestamp, parameters and file format. This supports traceability and interoperability.
4. Enable data users to understand data (supporting info)	Full	Data tables, diagrams, and explanatory notes are provided to facilitate user understanding.
5. Make data assets discoverable (open where possible)	Partial	Supporting information (data tables, diagrams, explanatory notes) is provided for all datasets, but access is currently limited to UK Power Networks and project partners. Wider accessibility for external users is under consideration as the project matures.
6. Learn and deliver to user needs	Partial	Stakeholder engagement is active, with regular feedback from partners and operational teams. Processes for systematically capturing and responding to evolving user needs, including future external users, are being developed
7. Prioritise data quality based on user needs	Full	Data quality is assured through regular validation, profiling, and cleansing, supported by automated alarms and manual checks. Quality assurance is prioritised to support robust analysis and reporting.
8. Ensure data assets are interoperable	Full	Data is provided in interoperable formats (CSV) and with standardised metadata, supporting integration with other platforms and future digital twin initiatives.

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9. Secure and resilient data (SPaR best practices)	Full	Robust security measures are in place, including: Compliance with GDPR/DPA, ISO 27001, dual-factor authentication, and secure backup protocols. No personal data is being collected through the Trials Any sensitive information is excluded from shared datasets
10. Store, archive and sustain data assets	Partial	Retention and archiving policies are defined for most data sources, though confirmation is pending for some specific datasets such as occupancy statistics and surrogate site data.
11. Treat Data Assets as Presumed Open (with Open Data Triage)	Partial	All project data is reviewed using a clear process to decide how it can be shared. Some data is marked as restricted and only shared with approved partners under specific conditions. In future, the project plans to share summary data that combines information from different sources, with sensitive details removed.