

AMIDS District Heating Network



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Innovation District
Scotland

Key Discussion Points

1. What is AMIDS?
2. Developing the concept - Our journey to a 5th Generation Heat Network
3. How it works and lessons learnt
4. Wider potential - Setting the standard of using low carbon energy
5. What happens next?

What is AMIDS?

The **Advanced Manufacturing Innovation District Scotland** is a collaborative project creating Scotland's home of manufacturing innovation



- Attracting companies to locate and invest in advanced manufacturing in Scotland
- Focused on a net zero future
- Home to two major innovation centres as anchor tenants, with plenty of space to grow!
- AMIDS will allow industry to collaborate and excel to benefit the local and national economy

Where is AMIDS?

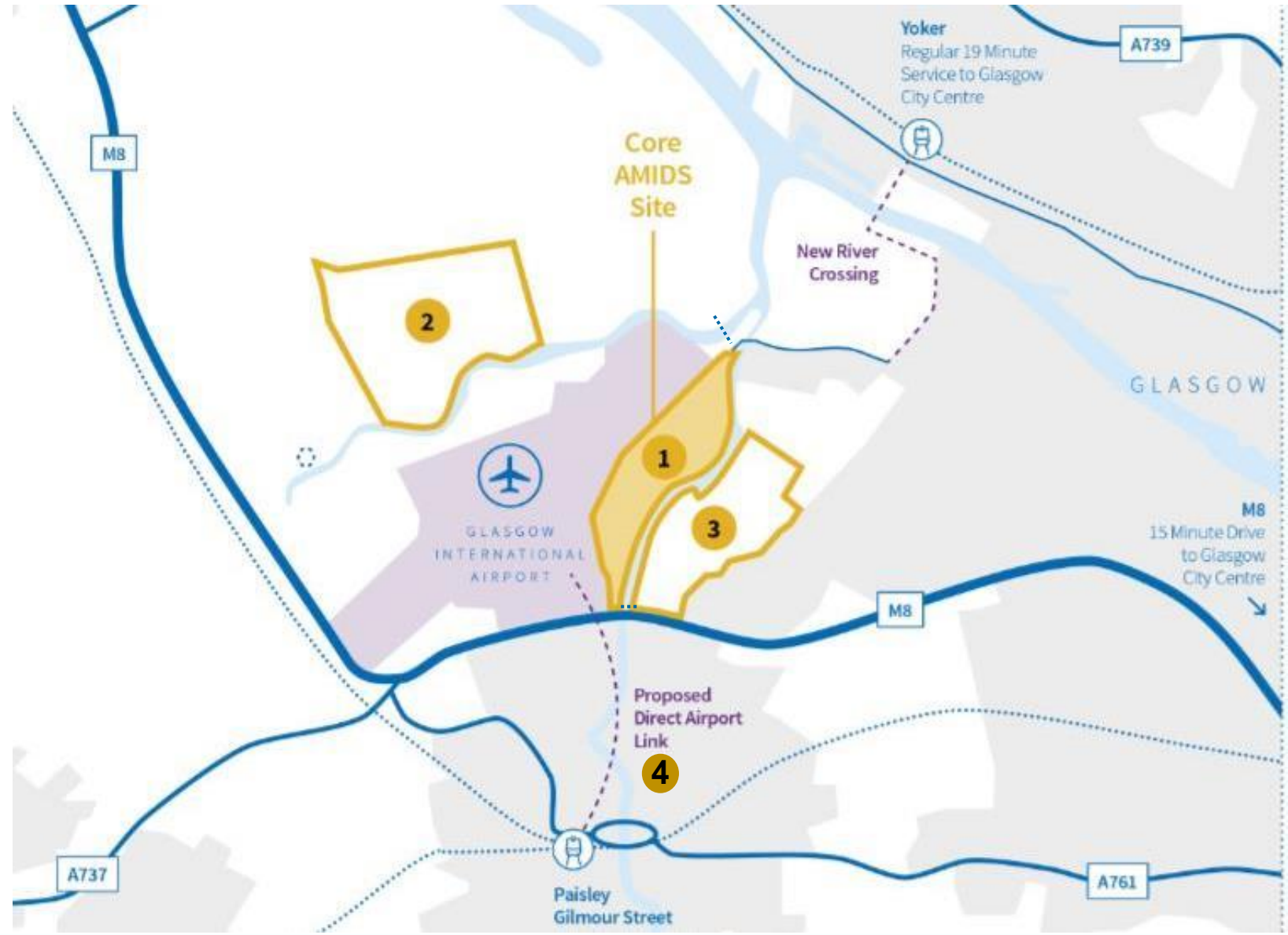
Renfrewshire, Scotland

- 183,800 population
- Second-highest employment rate in Glasgow City Region
- Working towards net-zero by 2030
- 8,000 people work in manufacturing in Renfrewshire
- Home to Boeing, Rolls Royce, Terumo Aortic, Thermo Fisher Scientific, Scottish Leather Group, Peak Scientific



Location

1. Core Site
2. Inchinnan Business Park
3. Westway Park
4. AMIDS South



Core Site

- Council owned with 52 hectares of flexible development space
- Home of the National Manufacturing Institute Scotland (NMIS) and the Medicines Manufacturing Innovation Centre
- New development partnership created to attract new developments and secure investment into AMIDS



Net Zero Environment

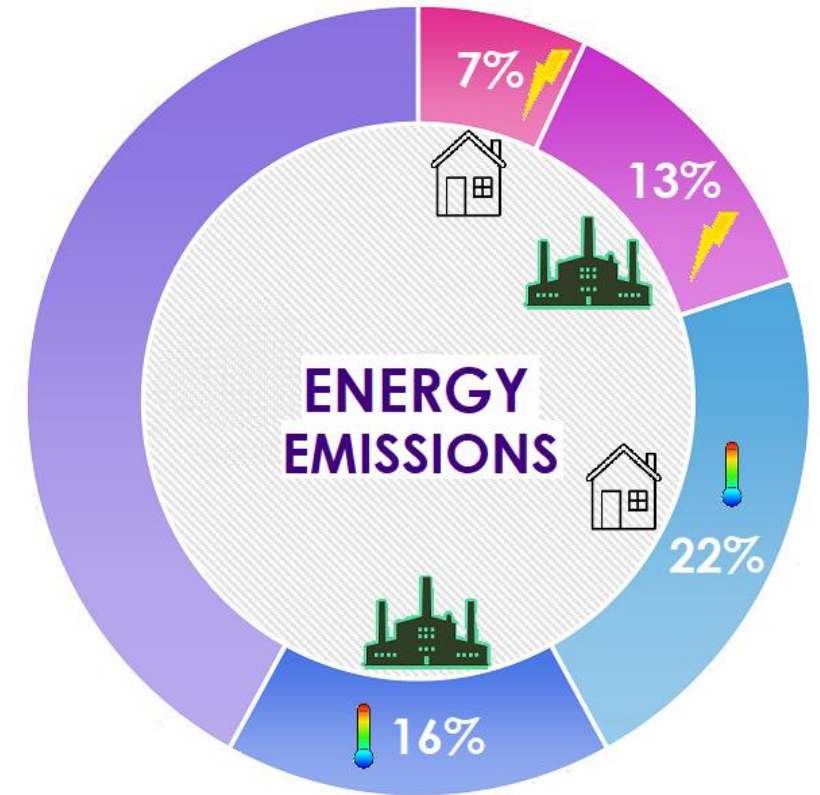
Setting the standard

- Active travel connections across AMIDS
- Renewable energy heating network
- Central square with green spaces to meet and collaborate
- New developments follow sustainable design guide
- Site wide travel plan under development



Renfrewshire's Energy Emissions

- Renfrewshire's energy consumption makes up **more than half (58%)** of the area's total emissions:
 - Electricity to power homes and businesses totals 20% of our total emissions (7% residential and 13% commercial and industry)
 - Gas and other fuels for heating homes and businesses total 38% of our total emissions (22% residential and 16% commercial and industry)
 - Latest figures show that 22% of households in Renfrewshire are in fuel poverty



AMIDS District Heating Network

Project Cost: £7.1million

- The first 5th generation renewable energy heat network in Scotland
- The first in the UK supplying a mixed-use development
- The first ambient (low temperature) loop in the UK connecting to a wastewater treatment works
- A carbon reduction of over 90% compared with conventional gas boiler



Our journey to a 5th Generation Heat Network

- 2018 Energy Assessment
- 2019 Energy Options Appraisals
Funding application to LCITP
- 2020 Detailed project development and business case
Application for tariff guarantee
Procurement of DBOM contractor commenced
- 2021 - Funding and tariff guarantee confirmed
- 2022 Heat supply agreements concluded
Concluded land agreements
Awarded DBOM contract
Started construction in October 2021
- 2023 Construction complete and operational April 2023

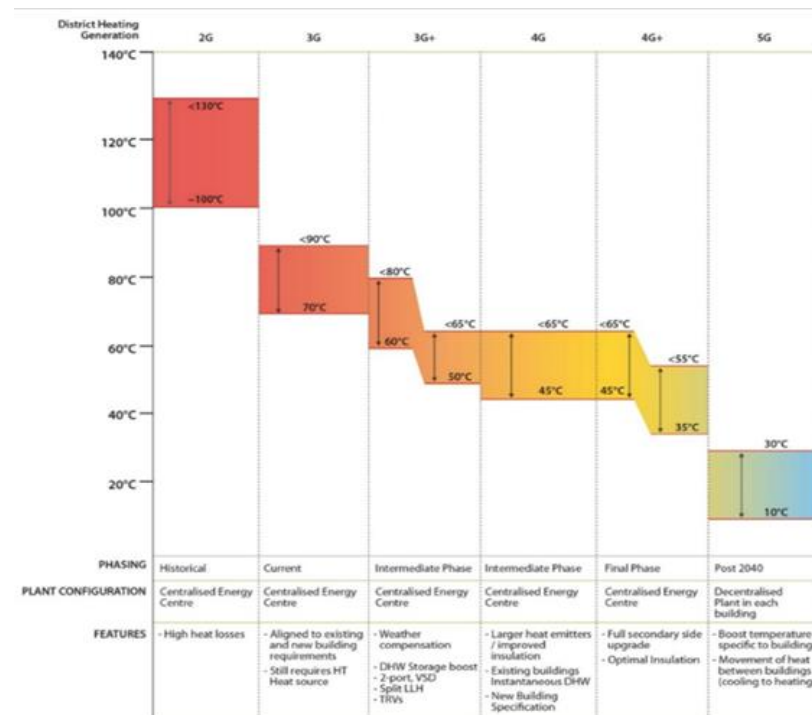


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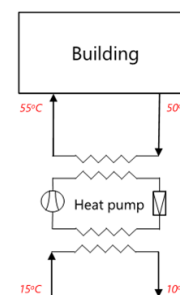
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What is a 5th Generation Heat Network?

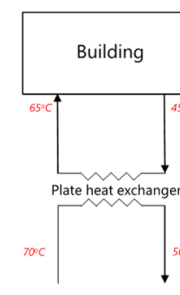
- Low temperature water circulates between buildings (ambient loop) heated by a renewable heat source or waste heat
- Heat pumps within each building extract heat from the loop to generate higher temperature water to serve the building
- Opportunity to connect cooling systems to add heat to the loop



Ambient loop



Centralised HP

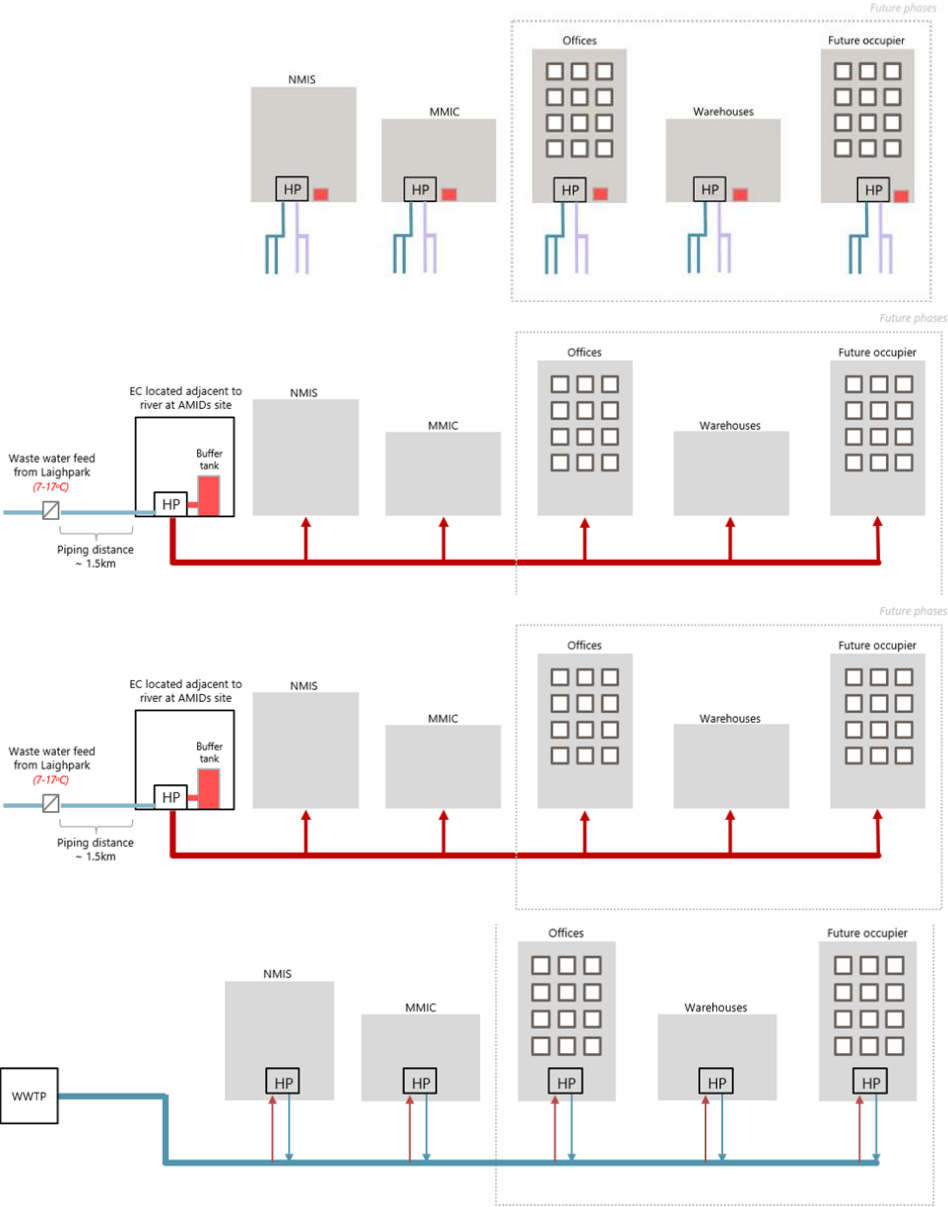


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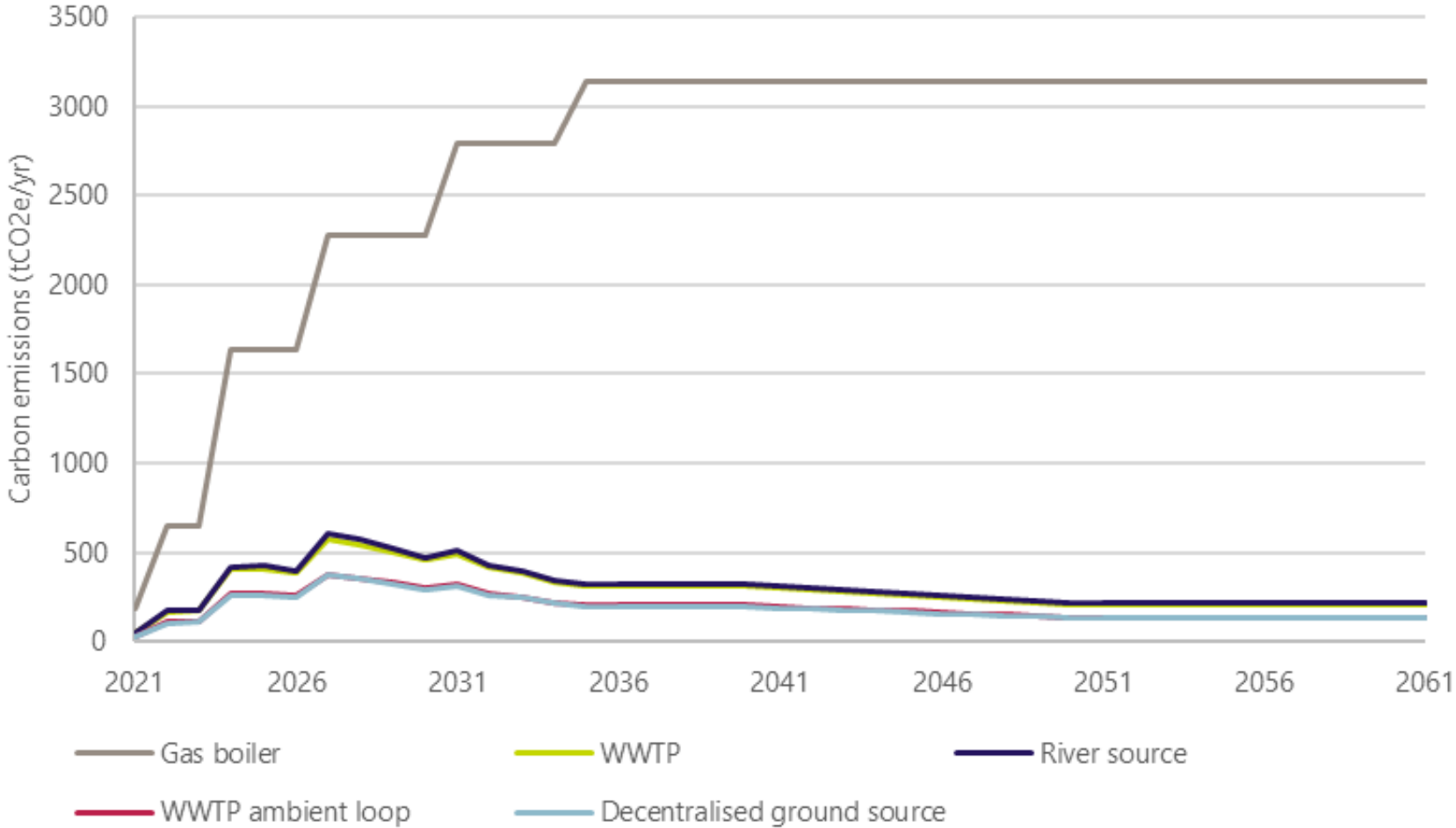
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Options Appraisal

- Decentralised individual GSHPs at each building
- Centralised water source heat pump at Laignpark wastewater treatment plant (4G)
- Centralised river source heat pump on AMIDS site (4G)
- Decentralised ambient loop, fed from Laignpark wastewater treatment plant (5G)



Carbon Emissions

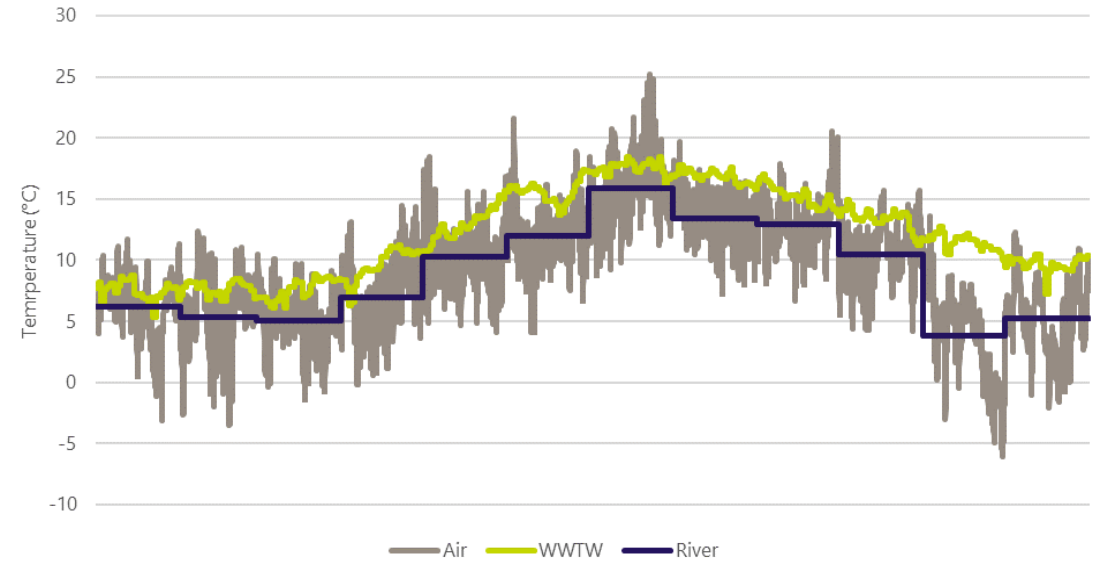


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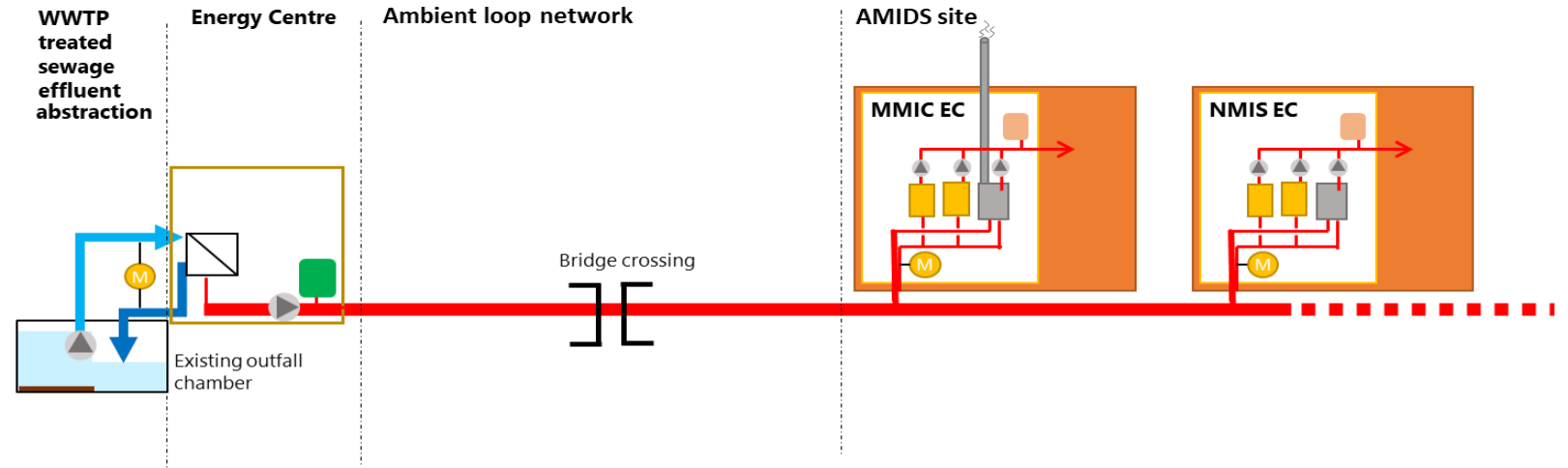
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Why this system?










- Access higher temperature renewable heat source at WWTW
- Decentralised and scalable which aligns with the uncertain timescales of AMIDS build out
- Lower cost pipework versus traditional DHN pre-insulated steel – faster install and larger skills availability
- Appraised over a 40 year period with an IRR > 3% to be at a minimum self-financing over the scheme lifetime.



Simplified Schematic of AMIDS DHN

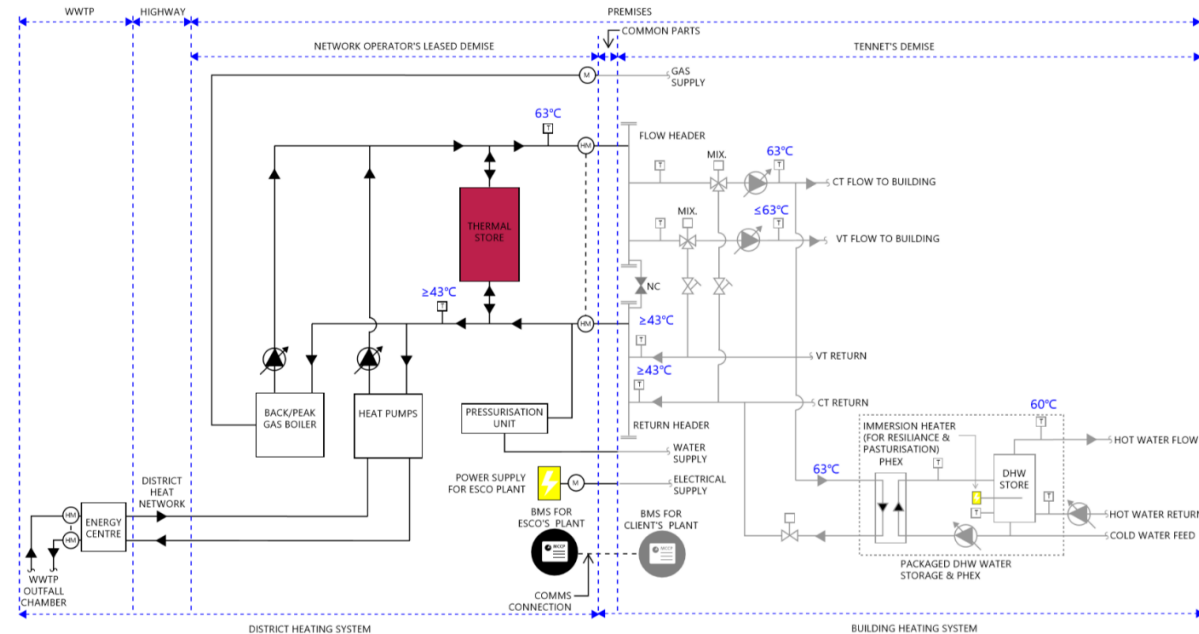
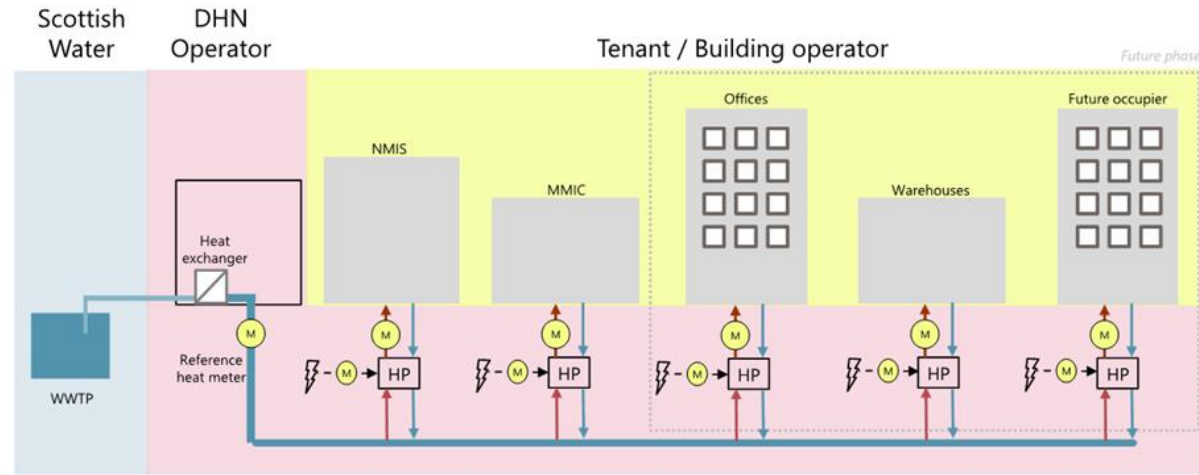


LEGEND

- | | | | | |
|---|---|--|--|---|
|  Ambient loop pipework flow/return |  Water treatment, pressurisation etc |  Heat meter |  Plate Heat Exchanger (PHX) |  Gas or electric boilers |
|  Extension pipework |  Thermal stores |  Heat pump |  Pumps | |

Ownership Demarcation

- No hydraulic separation and shared plantroom
- Key interfaces
 - Electricity
 - Water
 - BMS
- Commissioning and water quality
- Metering and billing



Lessons learned

| | What went well? | What could we do better? |
|----------------------|---|---|
| Economics | Robust financial modelling from early stages of project | Further consider effect of market volatility in energy market |
| Design | Specialist consultancy support procured for duration of project | Allow more time for design development prior to tender |
| Construction | Collaborative working between client and contractor | More supply chain engagement |
| Commissioning | Pressure testing of pipework in stages prior to commissioning | Independent commissioning engineer |
| Operational | Automatic generation of reports for invoicing | Earlier consideration of end user output / format of reports |

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Wider potential

Setting the standard of using low carbon energy

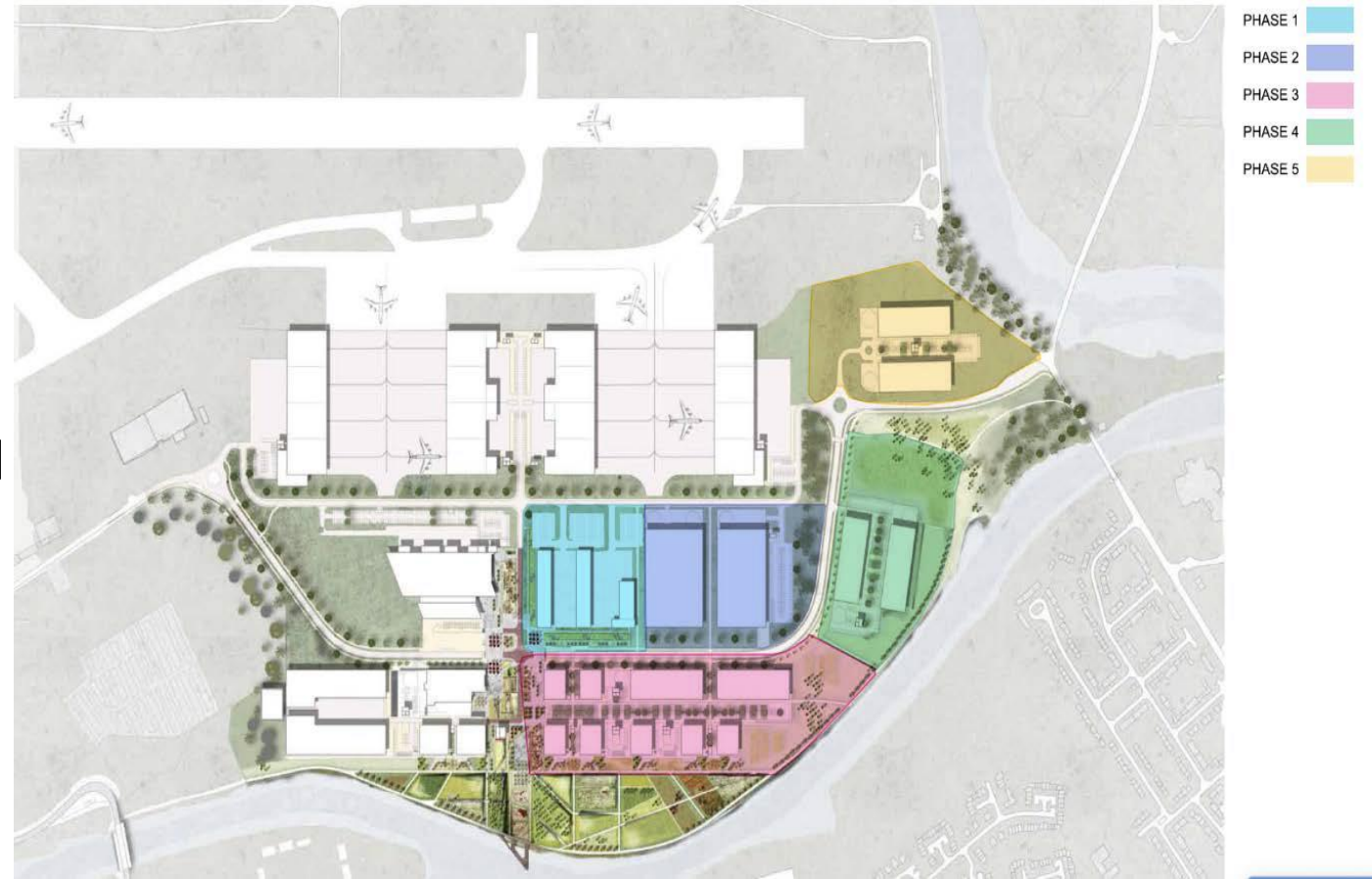
As a Council, we will play a leadership role by striving to become a net zero organisation while working closely with businesses, partners and stakeholders to make radical, but essential, changes in Renfrewshire.

- **89% of Renfrewshire's homes use mains gas** as their primary source of heat (higher than the Scottish average of 79%)
- Council housing stock currently makes up **nearly 15%** of the overall housing in Renfrewshire



What happens next?

- **Collaboration is critical**
- New development partner
- Ongoing feasibility study to identify opportunities for expansion of AMIDS DHN
- Future connections and customers
- Further infrastructure connections





Medicines Manufacturing
Innovation Centre



Supporting AMIDS Further

Whilst development on the core Netherton site progresses, we are also well advanced with further connecting infrastructure



AMIDS South –
£40m investment
connecting Paisley to
AMIDS with new roads,
active travel, and road
bridge

Paisley Grammar
Community Campus -
£70m investment
to create a new state of
the art school campus
on the doorstep of
AMIDS



Clyde Waterfront & Renfrew Riverside - £100m investment delivering the first ever opening swing bridge on the Clyde. Connecting AMIDS with West Dunbartonshire and Glasgow.

Cultural Infrastructure Regeneration

Over **£100million** in cultural venues including flagship Paisley Museum

Paisley Museum Reimagined - £45m Investment



Paisley Learning & Cultural Hub £7m investment



Paisley Townhall Refurbishment - £22m investment

Thank you



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www.renfrewshire.gov.uk/AMIDS

www.paisley.is/AMIDS