EnergyPath Networks: Results for Newcastle City Council

"a clean, intelligent, energy system that works for people, communities and businesses"

Grant Tuff
Senior Engineer
ETI’s Smart Systems and Heat Programme

“Creating future-proof and economic local heating solutions for the UK”

- Connecting together – the understanding of consumer needs and behaviour with the development and integration of technologies and new business models into...

- Delivering enhanced knowledge amongst industry and public sector

- Resulting in industry and investor confidence to implement from 2020 which enables a UK heat transition

The Energy Systems Catapult will deliver Phase One of the SSH programme as a supplier to the ETI following the transition of the SSH programme team to the Catapult. From 2017 the Catapult will be responsible for delivery of Phase Two of the programme independently of the ETI.
EnergyPath Networks has been developed as part of the Energy Technologies Institute Smart Systems and Heat programme.

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Emissions Projection

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Different Scenarios

Business As Usual

Constraints Applied

No Constraints

Restricted Biomass

Predominant Heating System

Biomass Boiler

Gas Boiler

High Temperature ASHP

Hybrid Heat Pump

District Heating

Ground Source Heat Pump

Low Temperature ASHP

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Heating Systems by Scenario

Business as Usual

Constraints Applied

Restricted Biomass

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Housing Retrofit by Scenario

Including range across the scenarios

Number of Houses

- Transition One - No Insulation
- Transition One - Retrofit
- Transition Two - No Insulation
- Transition Two - Retrofit

Average of Scenarios
Business as Usual

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Sankey Diagram: Constraints Applied
Electricity Demand Projection

Including range across the scenarios
Electricity Network Peak Load Projection

Including range across the scenarios

- District Heat
- HV Feeders
- HV Substations
- LV Feeders
- LV Substations

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Gas Demand Projection

Annual Demand (MWh)

Time Period

2020
2030
2040
2050

ND Buildings
Energy Centre Technologies
Domestic buildings

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Network Capacity Projection

Including range across the scenarios

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Energy Centre Capacities: Constraints Applied

[Graph showing energy capacities over time for different sources: Water Source Heat Pump, Large Scale Heat Pump, Gas CHP, Gas Boiler, and Biomass Boiler.]

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Total System Cost

<table>
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<th>Scenario</th>
<th>Energy Centres</th>
<th>Biomass</th>
<th>Gas</th>
<th>Electricity</th>
<th>Energy Transmission</th>
<th>Energy Networks</th>
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<td>No Constraints</td>
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Network Capital Costs: Constraints Applied

![Network Capital Costs Graph]

- Heat Transmission
- Heat
- Electricity

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Network Operating Costs: Constraints Applied

Cost per year (£m)

Time Period

- 2015 - 2024
- 2025 - 2034
- 2035 - 2044
- 2045 - 2050

Heat
Gas
Electricity