THE UNIVERSITY of EDINBURGH

EAUC-Scotland: Energy Topic Support Network
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ENERGY MASTER PLANNING & LOW CARBON HEAT

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Our Context:

- Approaching 1,000,000 m^2 GIA
- >550 properties
- >40,000 students and 15,000 staff

- 5 x existing heat networks
- 1 x new heat network in development
- 1 x NHS embedded site
- 1 x large data centre (24MW supply)
- >£20M p.a. utility spend

Zero by 2040

The University of Edinburgh has committed to ‘net zero’ carbon by 2040.

This includes an ambition for zero emissions from heat and power.

Baseline: heat + power + student travel + staff travel

Energy Masterplan

‘Right Sized’

- Evaluate space use and efficiency
- Enable shared services and flexible use of space

‘Deep’ Energy Efficiency

- Minimise heat and power demands
- Accelerate efficiency investments
- Plan for effective building fabric upgrades
- Continuous commissioning / IoT analytics

Exemplary Construction Standards

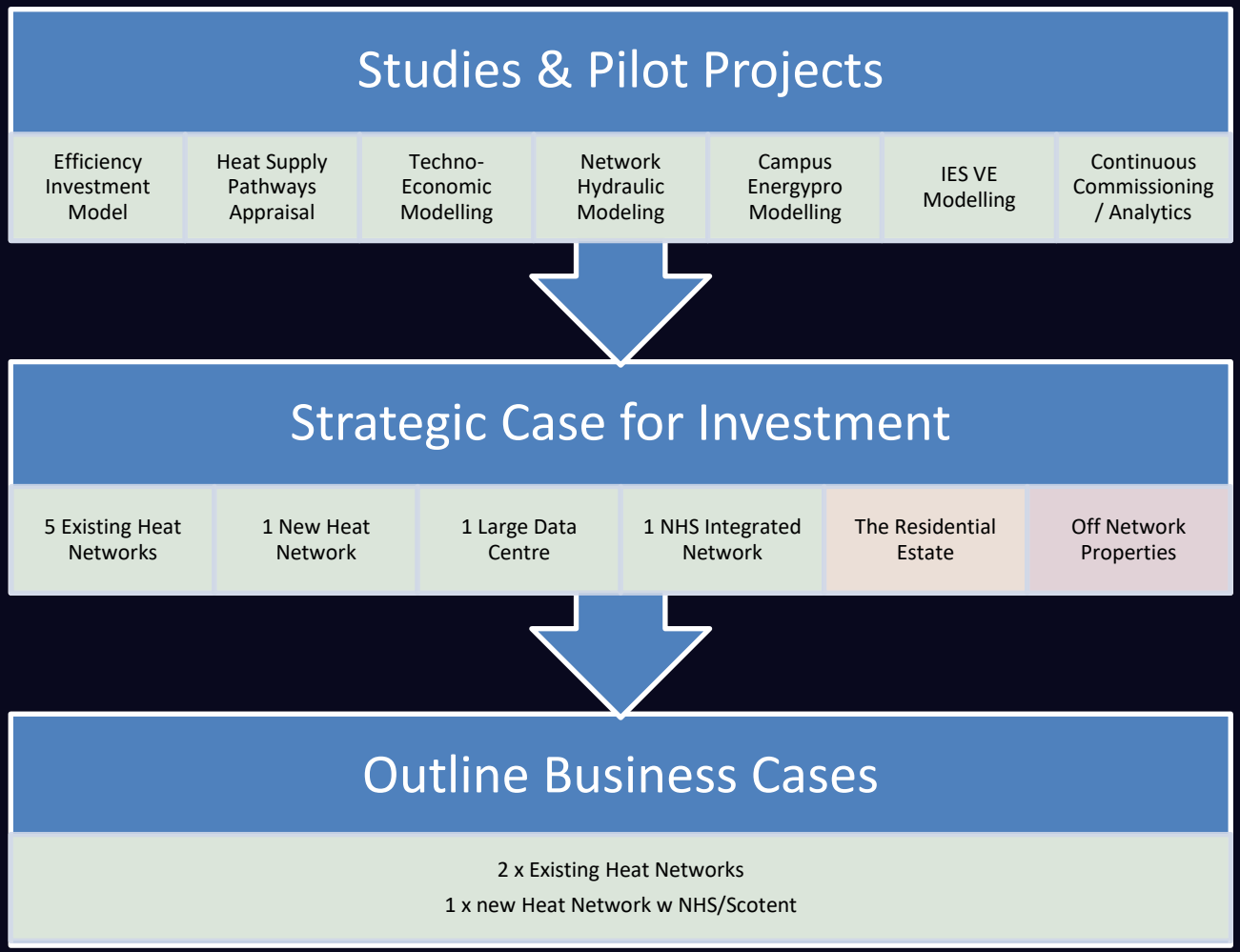
- Step change in construction quality and standards
- ‘Passive’ new build and refurbishment
- Next generation operating temperatures

Low Carbon Heat Networks

- Reduce DHN operating temperatures to <70°C
- Future proof our buildings for low carbon heat
- Plan for heat pump led heating strategies
- Plan for regional energy network integration

‘Smart Energy’ Research Hubs

- Teaching, learning and research
- ‘Living Lab’ for technology and digital tools.


Studies & Pilot Projects
Efficiency Investment Model
Heat Supply Pathways Appraisal
Techno-Economic Modelling
Network Hydraulic Modeling
Campus Energypro Modelling
IES VE Modelling
Continuous Commissioning / Analytics
Strategic Case for Investment
5 Existing Heat Networks
1 New Heat Network
1 Large Data Centre
1 NHS Integrated Network
The Residential Estate
Off Network Properties
Outline Business Cases
2 x Existing Heat Networks
1 x new Heat Network w NHS/Scotent

What have we Learned?

1. No ‘silver bullet’ - each campus has unique risks/opportunities.
2. Low carbon heat is expensive – CAPEX and OPEX.
3. Energy efficiency is crucial to mitigating OPEX
    1. Efficiency spend = 50% of CAPEX to 2040
    2. Increase spend from 5% to ~15% utility budget p.a.
4. Our current strategic ‘pathways’ have 30% residual emissions.
5. Our (extensive) heat networks are a key asset.

What is our Strategy

1. Accelerated energy efficiency investments – heat focus.
2. Maximise the lifespan and revenue from CHP assets
3. Optimize heat network performance
4. Lower existing heat network operating temperatures
5. Heat pumps + regional heat network integration
6. Minimised offsetting for residual emissions

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