

Performance of Heat Networks

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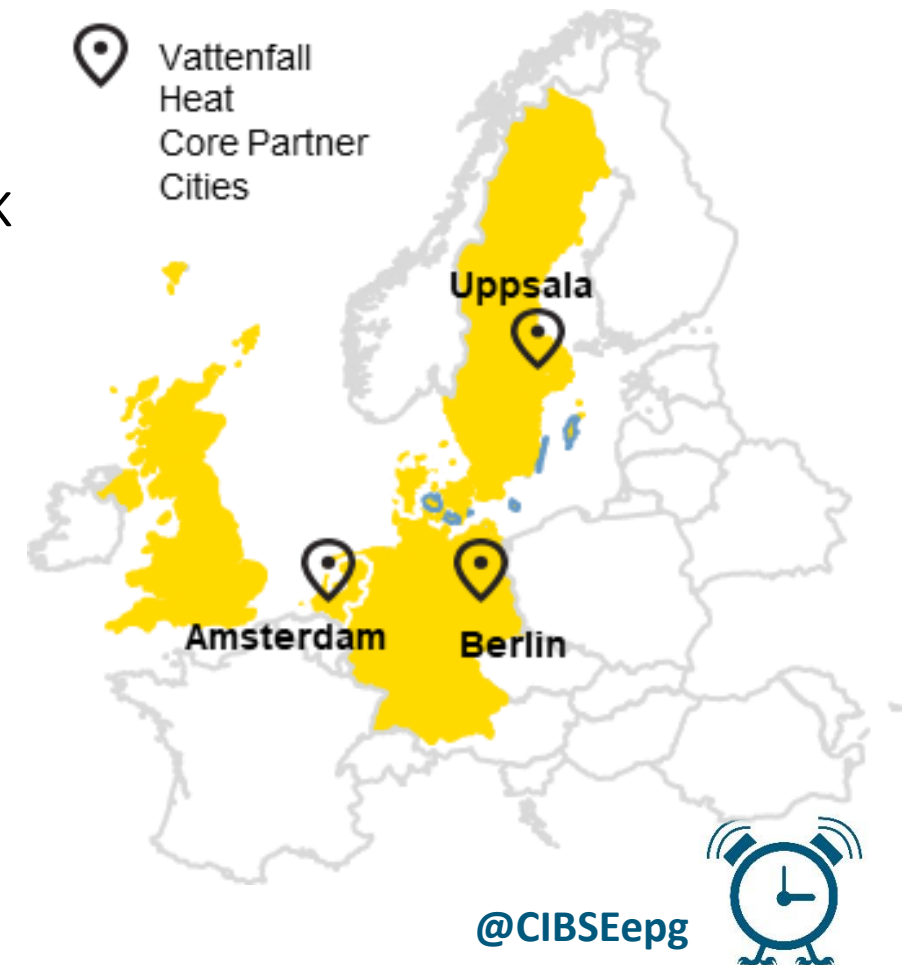
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Vattenfall Introduction

Vattenfall operate across the energy sector with the aligned vision of enabling fossil free living within a generation

- One of Europe's largest producers of electricity and heat
- Main markets: Sweden, Germany, Netherlands, Denmark and the UK
- About 22,000 employees
- 100% owned by the Swedish state
- 1.7m connected heat customers



Topics

- Measurement of Heat network carbon performance
- Design, Install and Acceptance of Heat Networks
- Digitalisation of Heat Network

Measuring Carbon

Stake Holders

Stakeholders	Planning (Future)	Building Regs (Future)	Stakeholder Carbon Ambitions (Future)	ESCO Generation (Future)	Operational (Historical, Real Time and Future)	Non-Financial Report (Historical)
Councils / Government	X	X	X	X		
Developers - regulatory	X	X				
Developers - ambitions			X	X	X	
ESCO/ Shareholders			X	X	X	X
End Customer				X	X	X

Sources

Source	Planning (Future)	Building Regs (Future)	Stakeholder Carbon Ambitions (Future)	ESCO Generation (Future)	Operational (Historical, Real Time and Future)	Non-Financial Report (Historical)
Standard Assessment Procedure (SAP) / Part L	X	X				
BEIS			X		X	
DEFRA			X	X		
ESCO Predictions			X	X	X	
Real Time – Fuel suppliers				X	X	
Historical – Fuel suppliers				X	X	
GHG Company Reporting				X		X



Design, install and acceptance



Design Liability

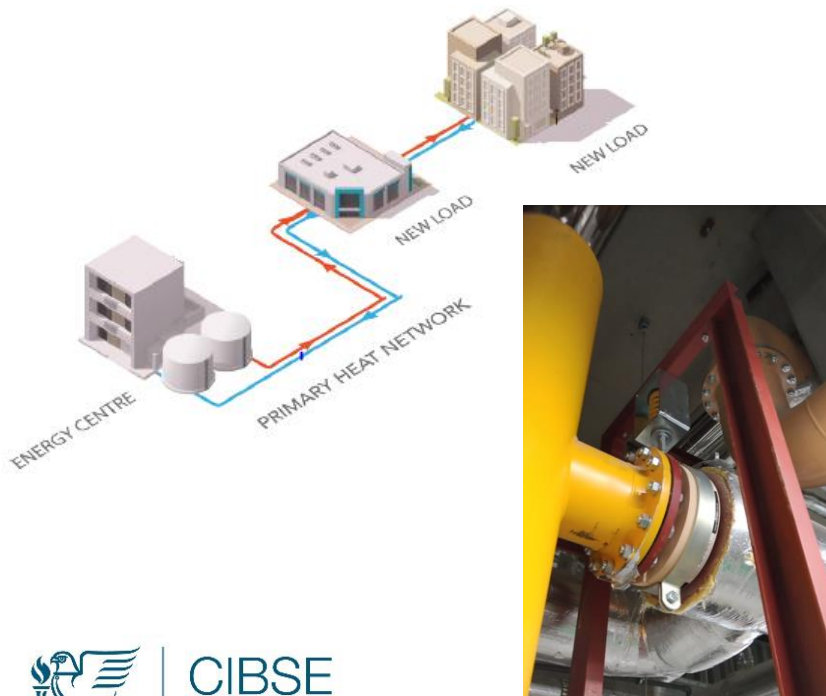
- Conservative estimates and demand curves from non UK averages, combined with contractual design liabilities of meeting network peak demand often leads to oversizing of plant rooms

Ongoing Network Extension

- Energy centre designed and commissioned to meet its full demand capabilities, this results in network performance particularly the ΔT earlier on

Project Timescales

- Identified snags not closed out at the point of handover often taking weeks/months to close out



Digitalisation



Cost Engineering

- Loss of useful data to allow finding areas of to improve performance

Hardware Performance

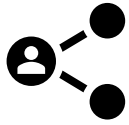
- Low meter read performance creating gaps in the useful operational data

Diagnostics and rectification

- Under performance of heat networks remains undetected for long periods of time



Recommendations



- Improvement in Design



- Industry wide carbon measurement and reporting methodology



- Further Digitalisation - more measurements to target performance improvement



- Improvement in the operations of heat networks



- Influence customer behaviours

Thank you!

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