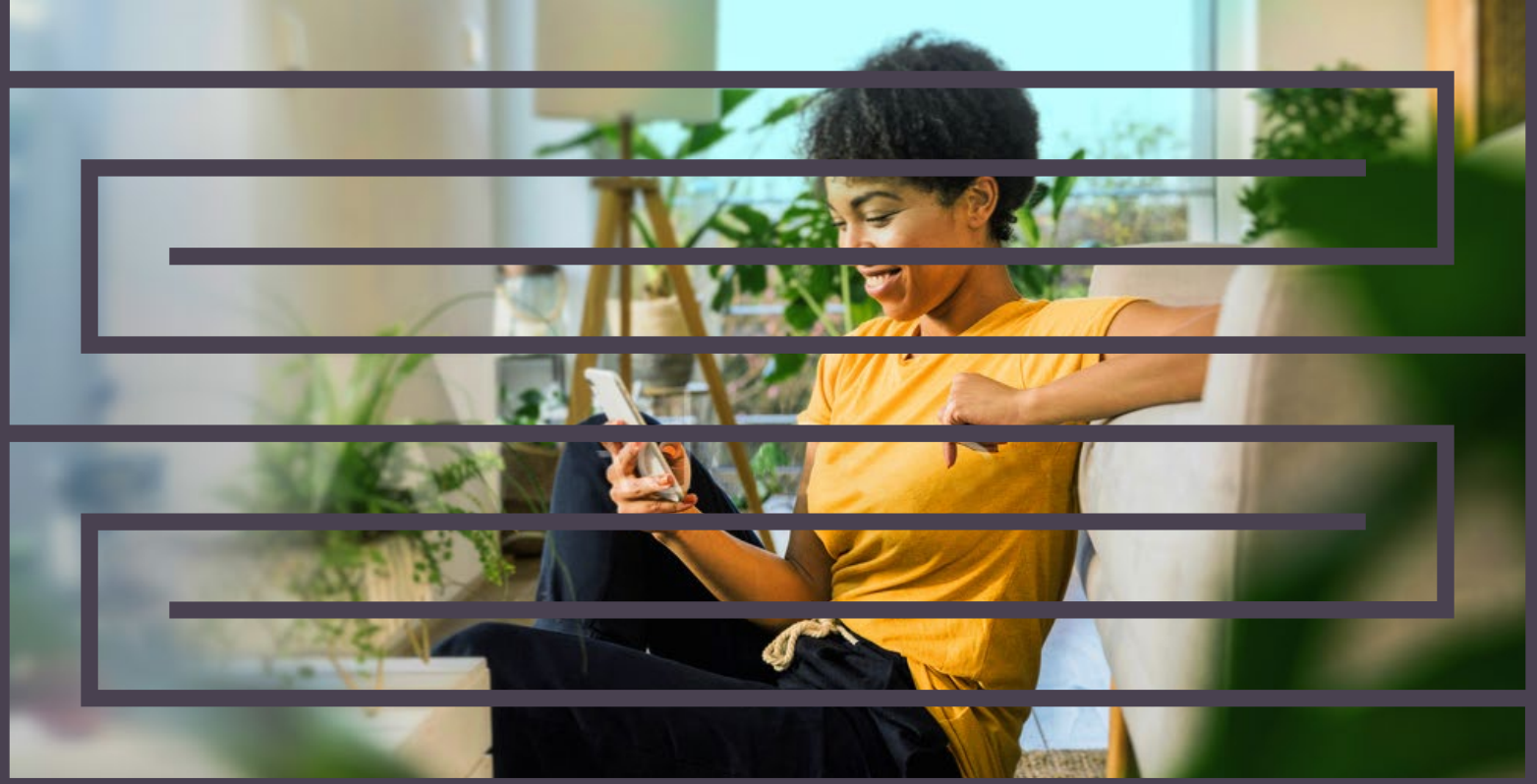
FairHeat Annual Conference 2024

23 April 2024: Introduction

FAIRHEAT

Agenda

- **09:30 – Opening Plenary**
- **09:50 – Session 1:** Industry Regulations – Heat Network Zoning, HNTAS and more.
- **12:00 – Lunch**
- **12:45**
  - **Session 2A:** Quality Assurance of New Build Developments and its importance with upcoming regulations
  - **Session 2B:** How upcoming regulations will affect heat network operators and how to prepare for it.
- **14:30 – Break**
- **15:00 Session 3:** Technical Innovation & Research Session
- **16:30 – Closing Plenary**



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Opening Plenary

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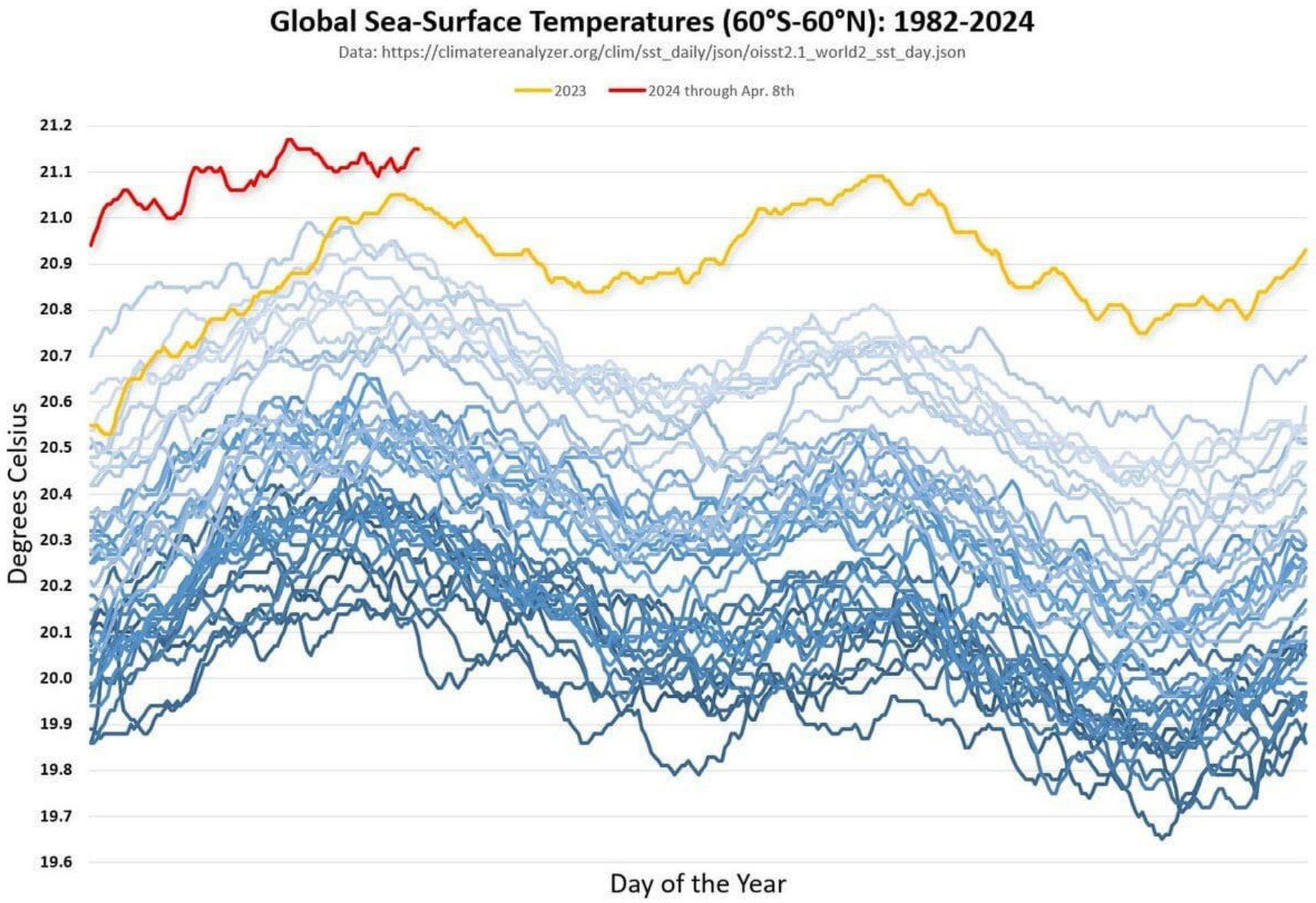
Climate models can’t explain why 2023 was so hot



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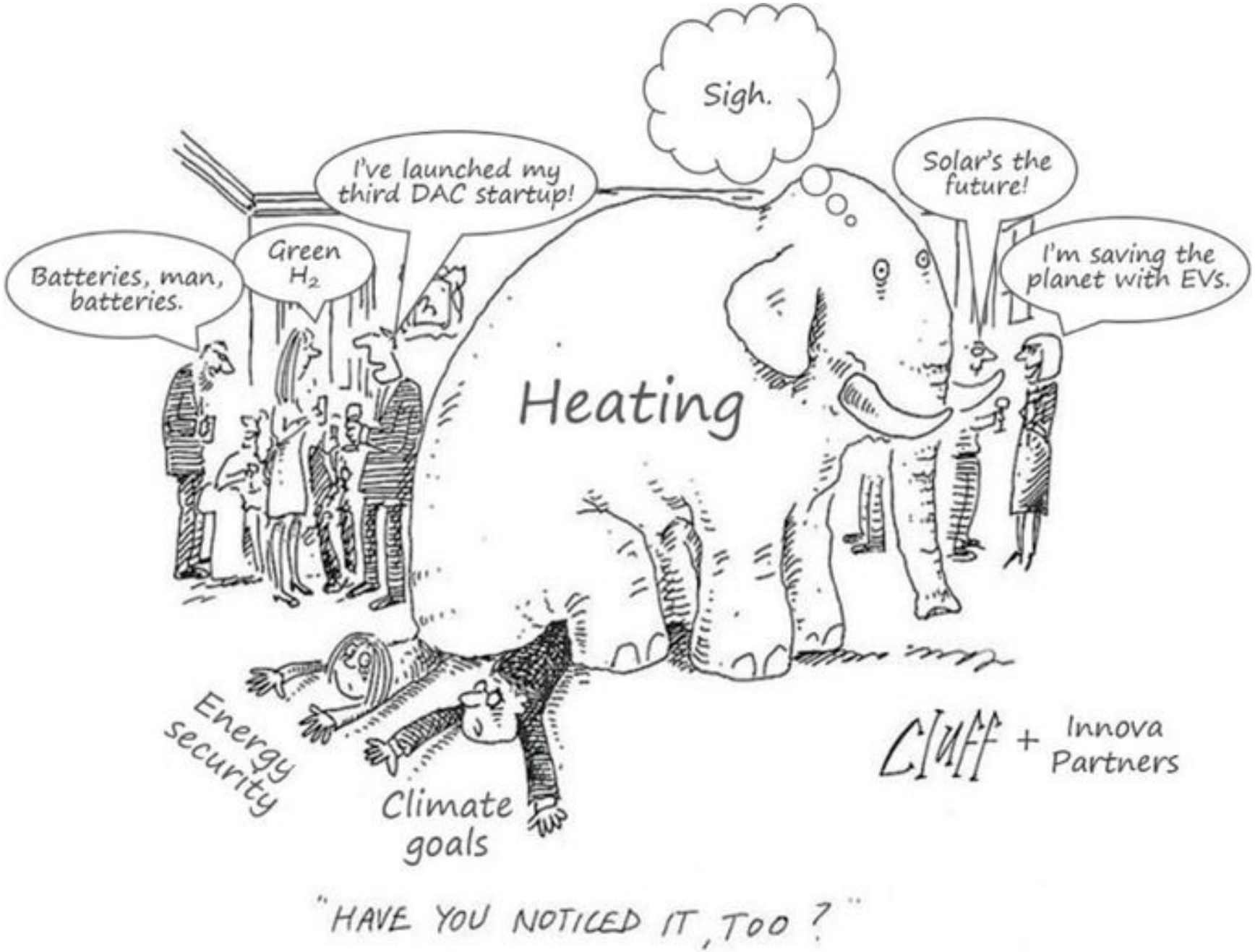
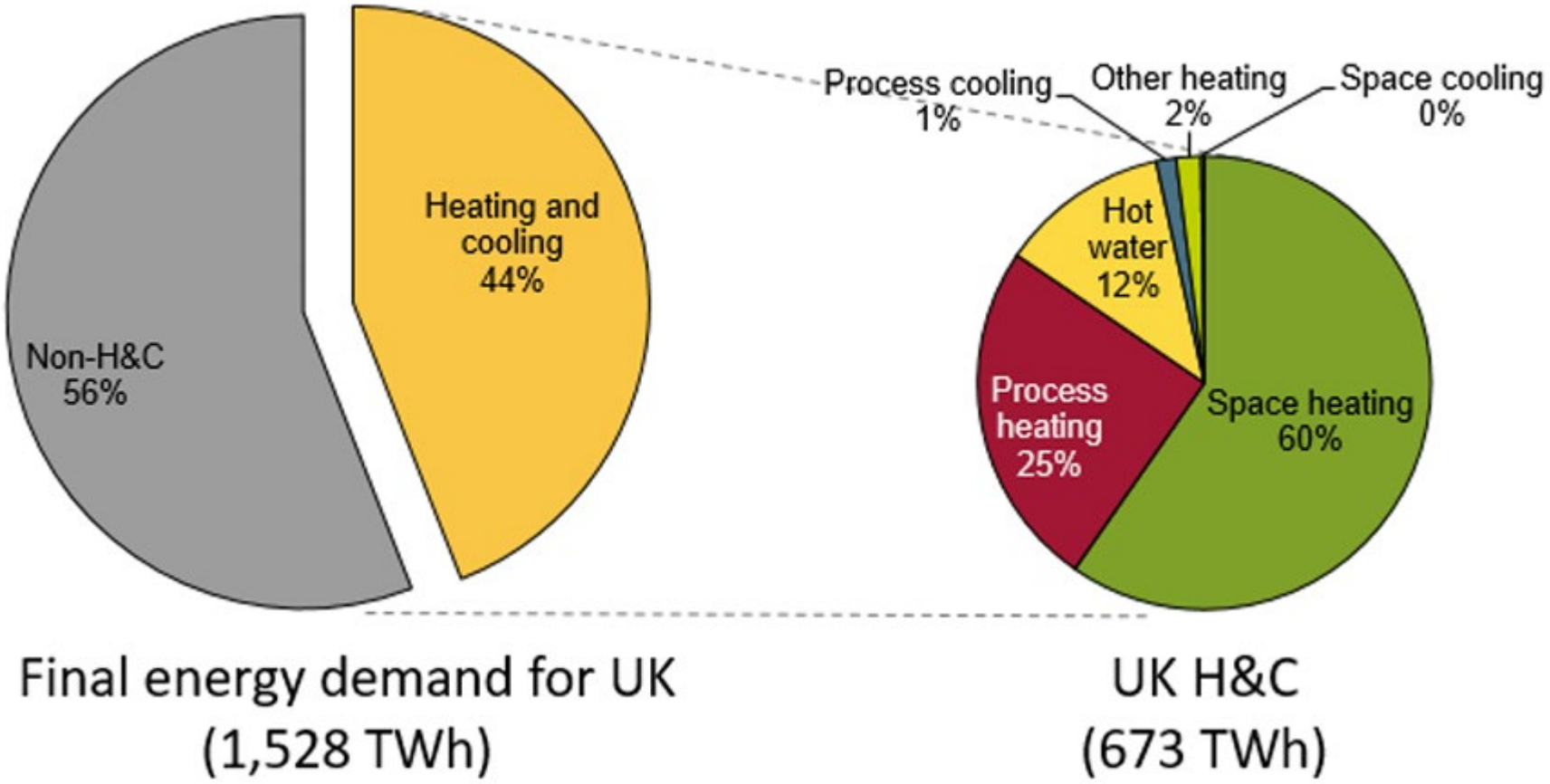

Sigh.
I've launched my third DAC startup!
Solar's the future!
Batteries, man, batteries.
Green H_2
I'm saving the planet with EVs.
Heating
Energy security
Climate goals
Cliff + Innova Partners
"HAVE YOU NOTICED IT, TOO?"

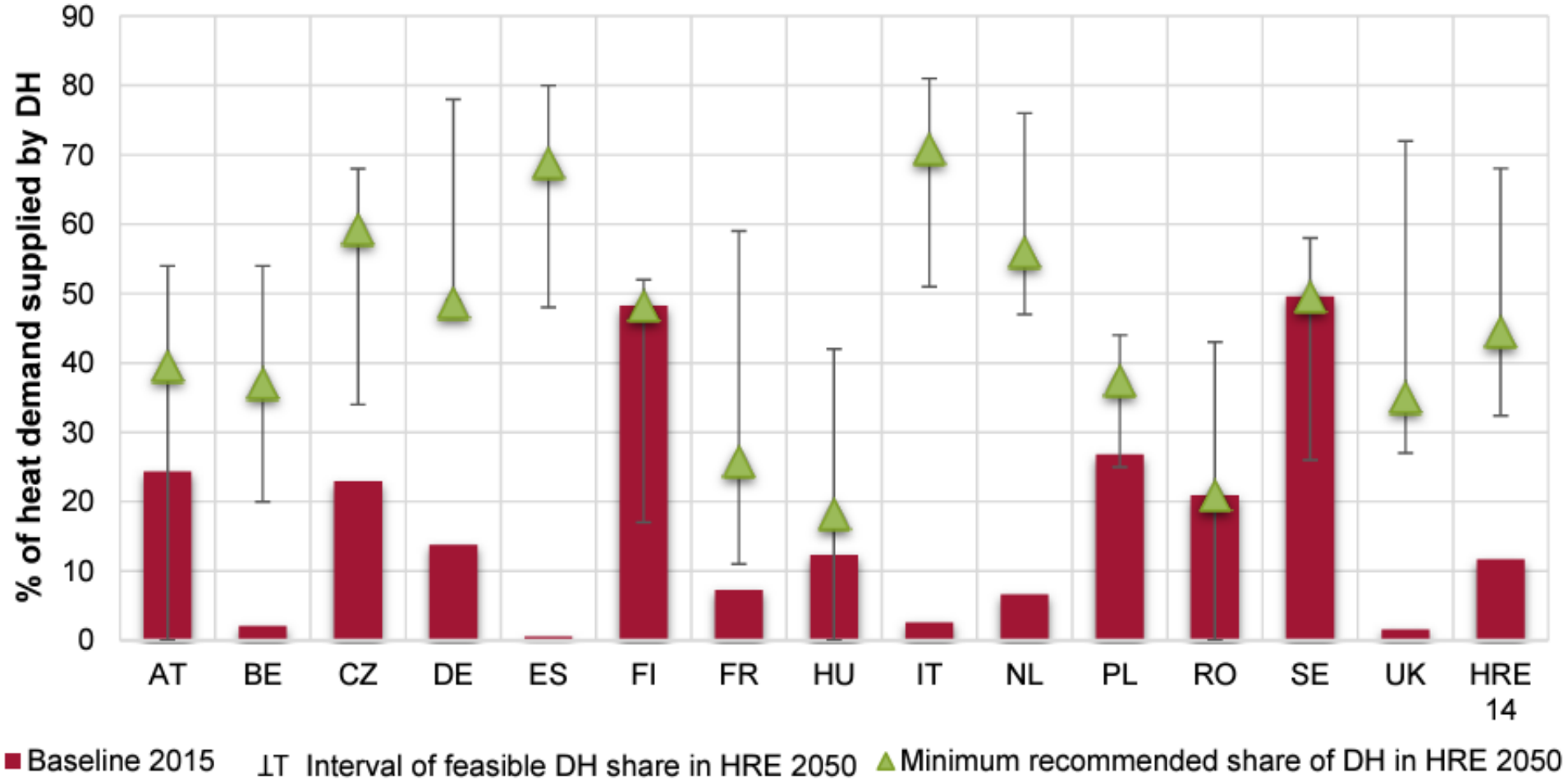
Heat represents >40% of UK final energy demand



Heating and cooling demand in the United Kingdom by end-use compared to total final energy demand (2015 values)

Source: Paardekooper et al (2018) Heat Roadmap United Kingdom (figure 4)

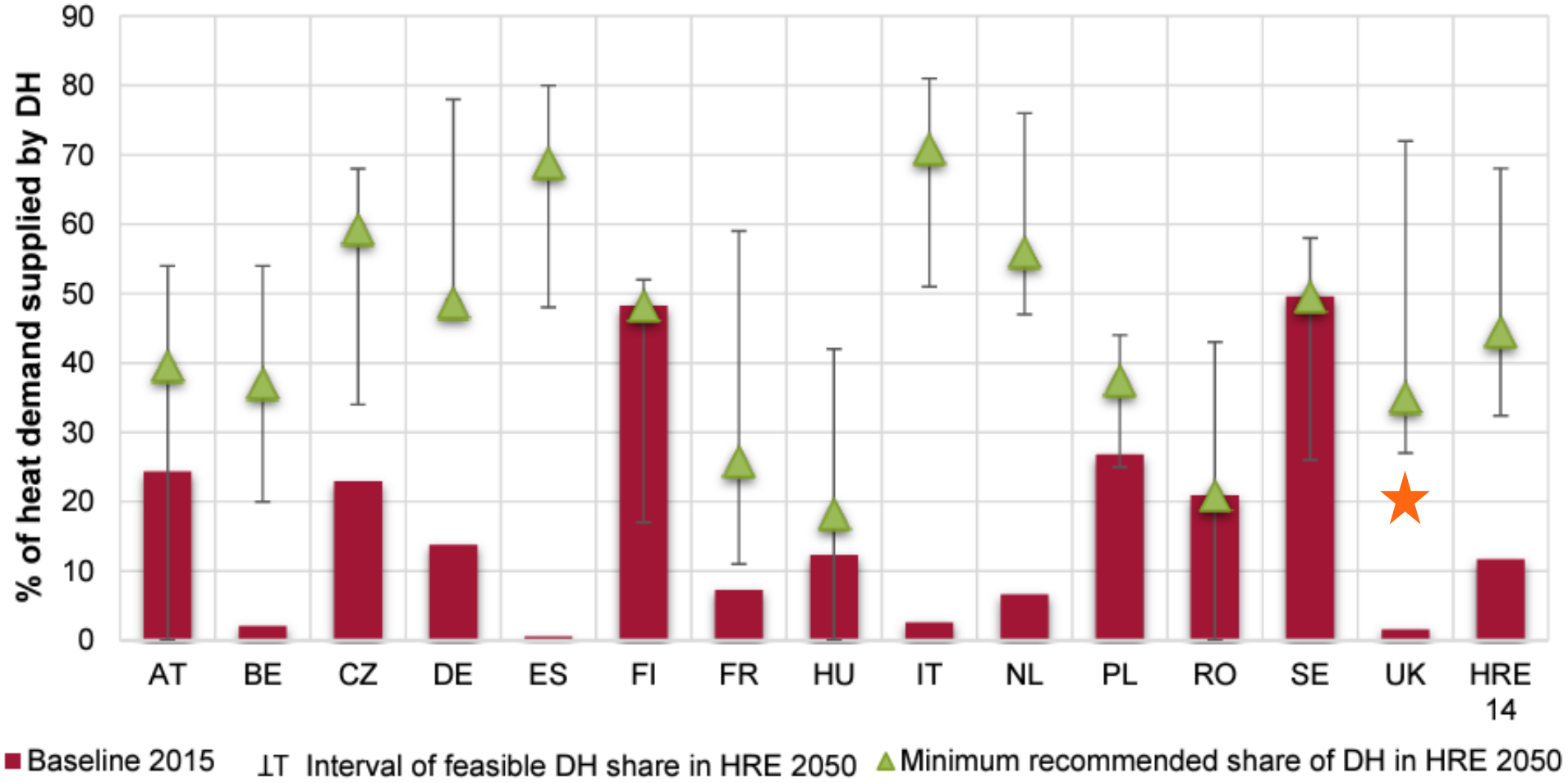
DH feasible for delivering between 25% and 75% in UK



Baseline share of district heating in 2015 and the minimum recommended level of district heating share in HRE4. The range bars represent the amount of DH that is economically feasible within 0.5% total annual energy system cost change sensitivity.

Source: Paardekooper et al (2018) Heat Roadmap United Kingdom (figure 18)

UK Government targeting 20%



Baseline share of district heating in 2015 and the minimum recommended level of district heating share in HRE4. The range bars represent the amount of DH that is economically feasible within 0.5% total annual energy system cost change sensitivity.

Source: Paardekooper et al (2018) Heat Roadmap United Kingdom (figure 18)

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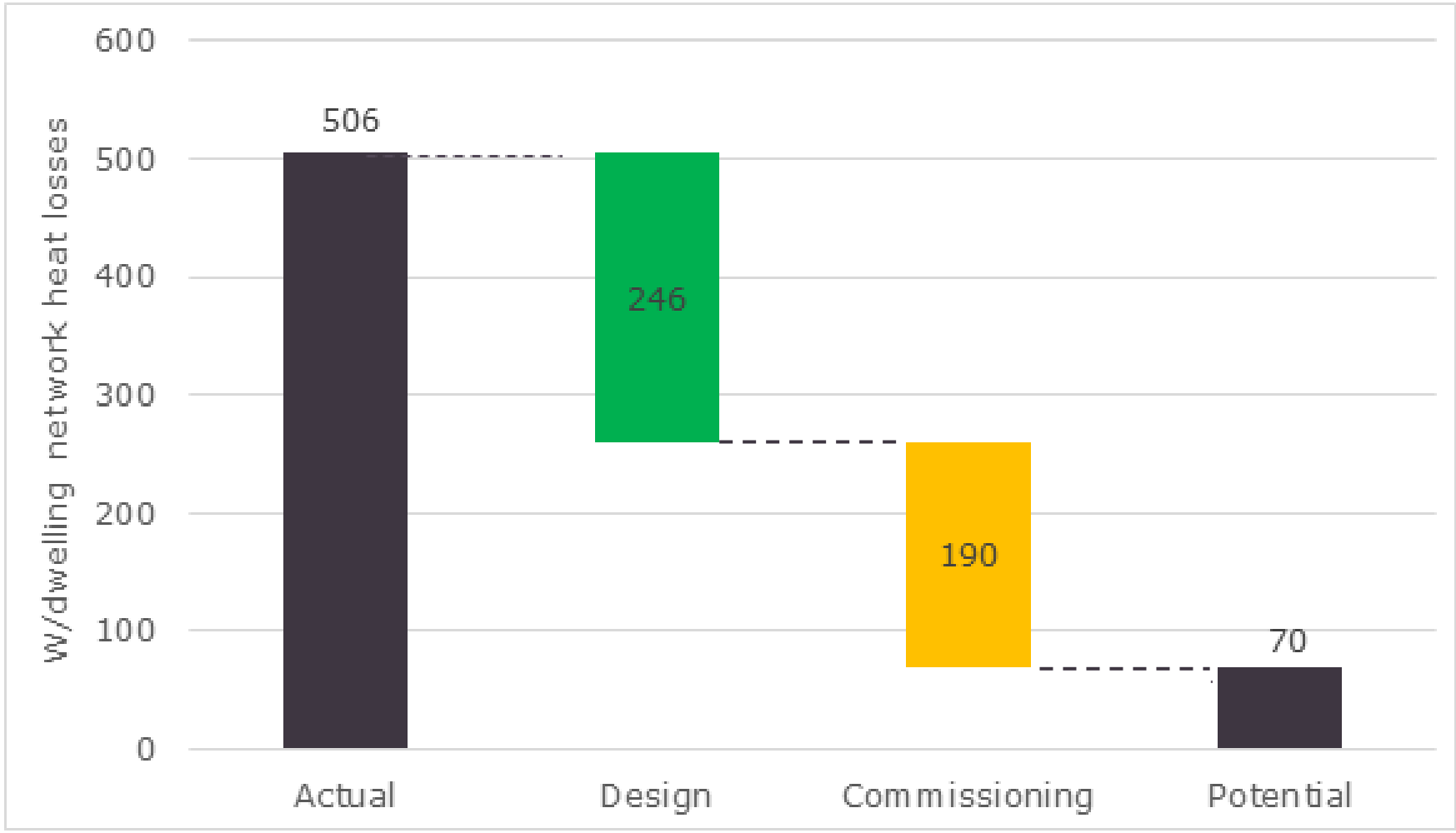
Zoning a core part of the concept

But need to protect consumers and developers of HNs

Drivers of performance gap between Actual and Potential (W/dwelling heat losses).



Source: SBRI Project, Optimising Heat Networks, 2016

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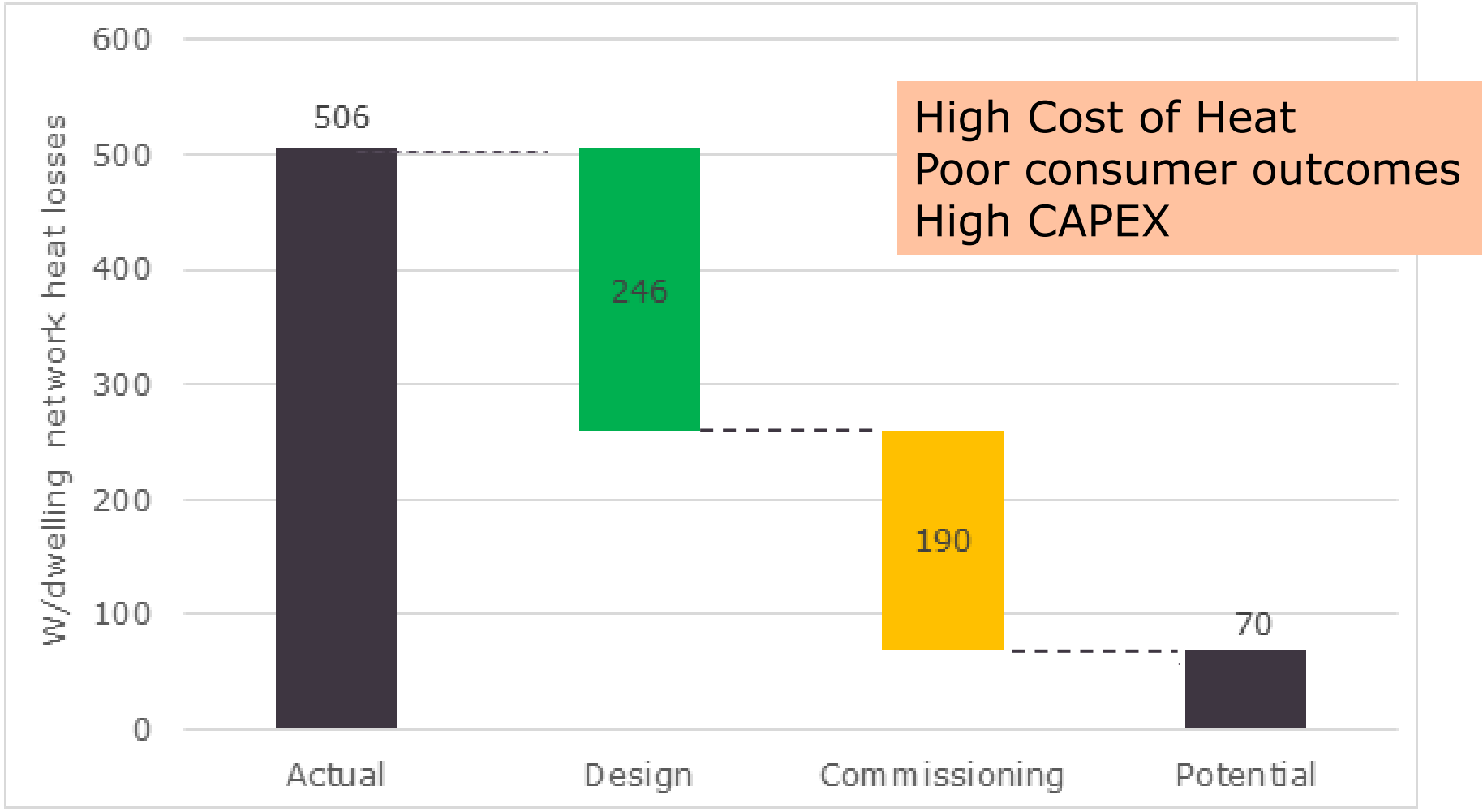

Source: SBRI Project, Optimising Heat Networks, 2016

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Technical quality assurance enables good performance

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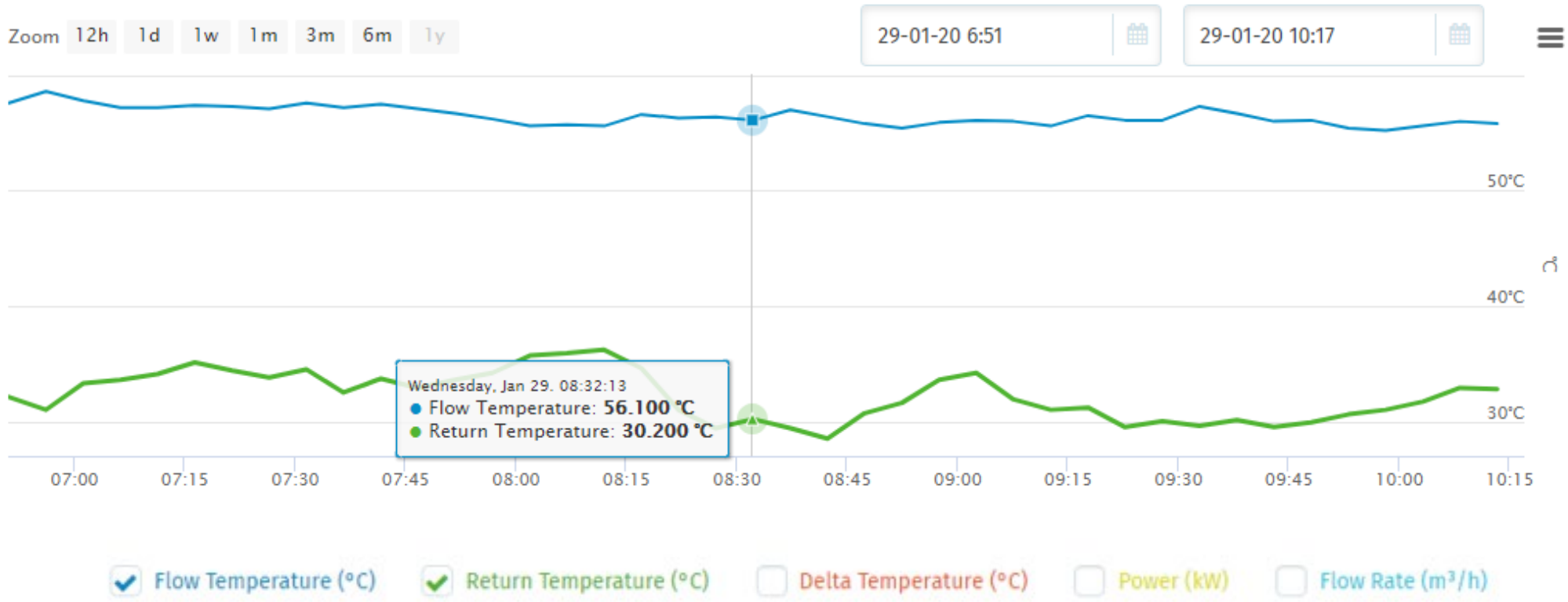
Example Network Flow & Return Temperatures, Residential 116 dwelling network: 29 January 2020



Heat Network Losses <70W / dwelling

Identified >£7,000 per dwelling cost of non-assurance

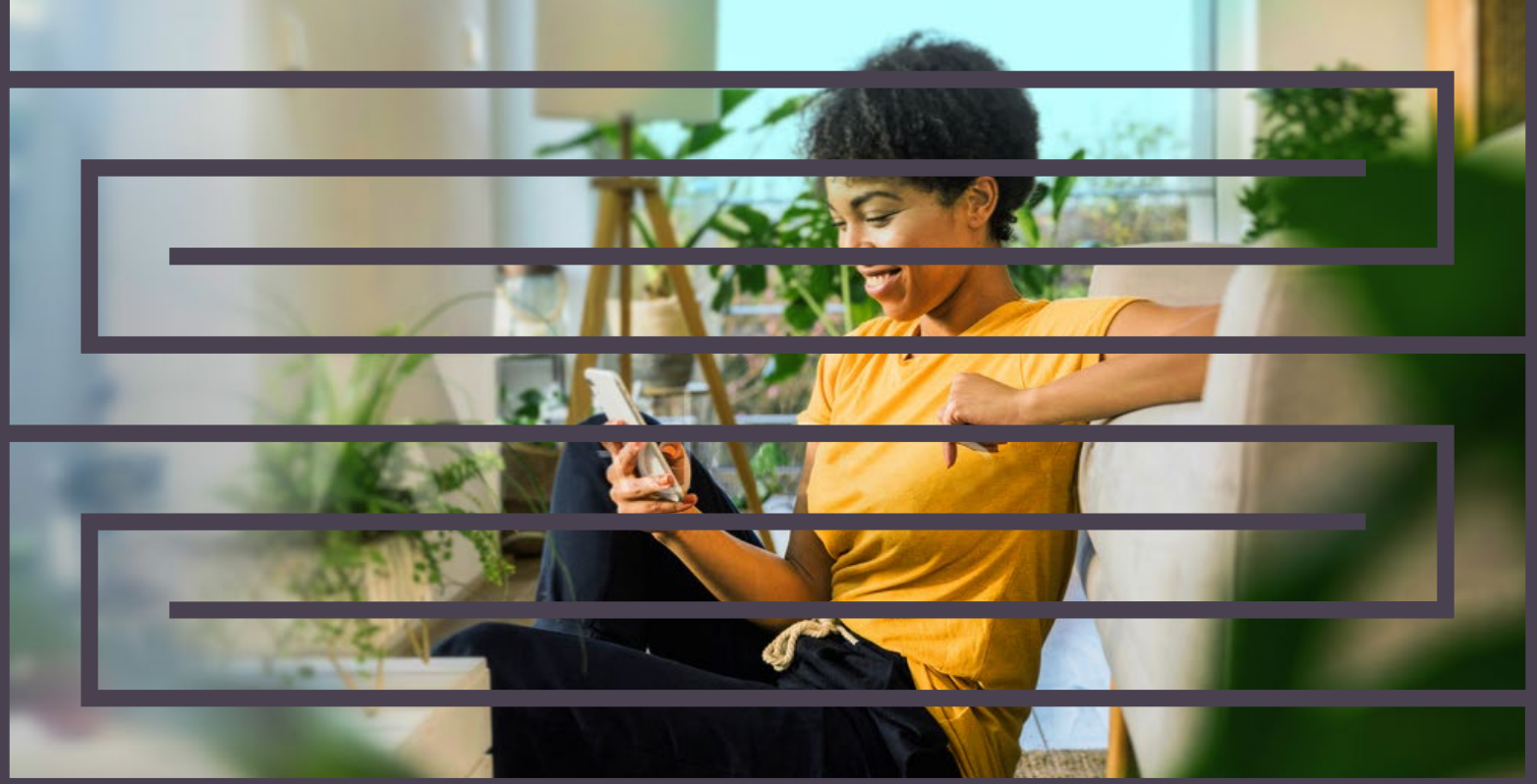
Summary of expected annual benefit of HNTAS per dwelling (£) and 20-year NPV per Dwelling (£) by identified Type of Opportunity

Identified Opportunity	Annual (£/dwelling)	20-year NPV* (£/dwelling)
Reduction in CAPEX		£900**
Reduction in heat network losses	£180	£2,500
Reduction in pump energy	£161	£2,300
Improved generation efficiency	£56	£800
Reduced O&M costs	£72	£1,000
Sub-Total: Direct benefit	**£462**	**£7,300**

*Using a 3.5% cost of capital, as per the STPR in the Green Book
**Assumes gas boilers, heat pump approaches significantly higher

HNTAS project

- 18 months
- Board comprised of DESNZ, ScotGov, Ofgem, Heat Trust, ADE & UKDEA
- 28 half day industry workshops
- 16 Technical Explanatory Papers
- 9 Framework Explanatory Papers
- >1,000Pages of normative documents



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Session 1: Industry Regulations

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Agenda – Session 1

Industry Regulations – Heat Network Zoning, HNTAS and more.

- 09:50
  - Overview of regulatory changes, including key features of zoning, etc (DESNZ, John Christopher)
  - Overview of HNTAS (DESNZ, Yasmin Burton)
  - Perspective of the regulator (Ofgem, Richard Bellingham)
- 11:00 – Panel discussion
- 11:40 – Q&A

Session 1: Speakers

John Christopher

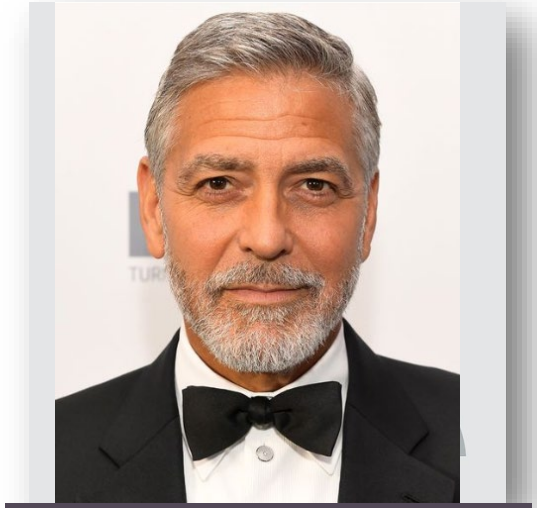
Senior policy advisor

Department for Energy Security & Net Zero

Yasmin Burton

Senior policy advisor

Department for Energy Security & Net Zero



Richard Bellingham

Head Of Heat Networks Implementation

ofgem

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April 2024

Overview of regulatory changes

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Why are we regulating?

- Transforming the market
- Protecting consumers
- Improving and decarbonising
- Building the pipeline

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The **Energy Act 2023** received Royal Assent in October 2023. It will:

- Establish the **regulatory framework** for heat networks:
  - Ofgem as regulator
    - Ensure fair and transparent pricing
    - Safeguard service standards
    - Enforce technical standards
  - Rights and powers licensing regime.

- Provide **zoning powers** in England:
  - Identifying and designating zones
  - Creating key zoning roles
  - Requiring certain buildings and heat sources to connect.

Photo Credit: Energetik

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Heat networks market framework

- Regulation of heat networks will seek to ensure that customers receive comparable standards of provision as other regulated utilities.
- This will be reached through introducing:
    - Consumer Protection
    - Mandated Technical Standards
    - Enhanced Meter Regulation
    - Rules on Step-in to cover market failure
- This will be implemented through an authorisations regime, similar to the existing licensing regime in gas and electricity markets.
- Rights and powers licensing framework
- Monitoring/reporting
- Compliance and enforcement

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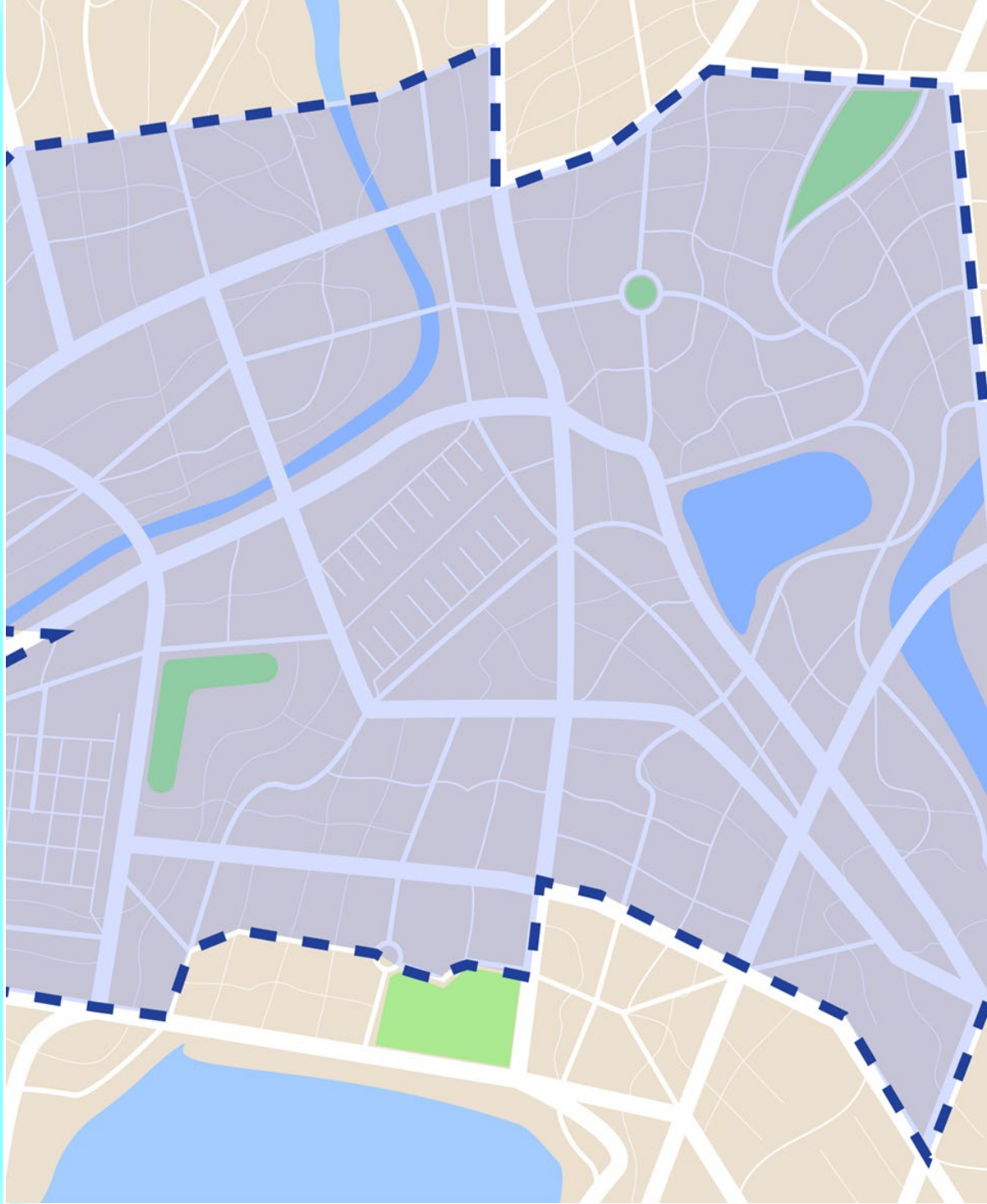
Heat network zoning

- **Heat network zoning will designate areas** where heat networks are expected to be the lowest cost low carbon heating option.
- **It will give local communities the tools** to accelerate the development of heat networks in their towns and cities.
- **We want to give developers and investors more certainty** about the number of likely connections to networks to help unlock the investment needed to build them.
- **This will remove the barriers to greener, cheaper heat** that currently limit the scale and pace of developing heat networks and encourage investment.
- **This will allow for large-scale strategic heat networks** to be built in towns and cities across the country.



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How will zoning be delivered?

- Enabling legislation in the Energy Act 2023.
- Consultation on heat network zoning – closed 26 February.
- Establish zoning co-ordinators and a national authority to oversee the process and support local zoning co-ordinators.

Where will zones be and how will this be communicated?

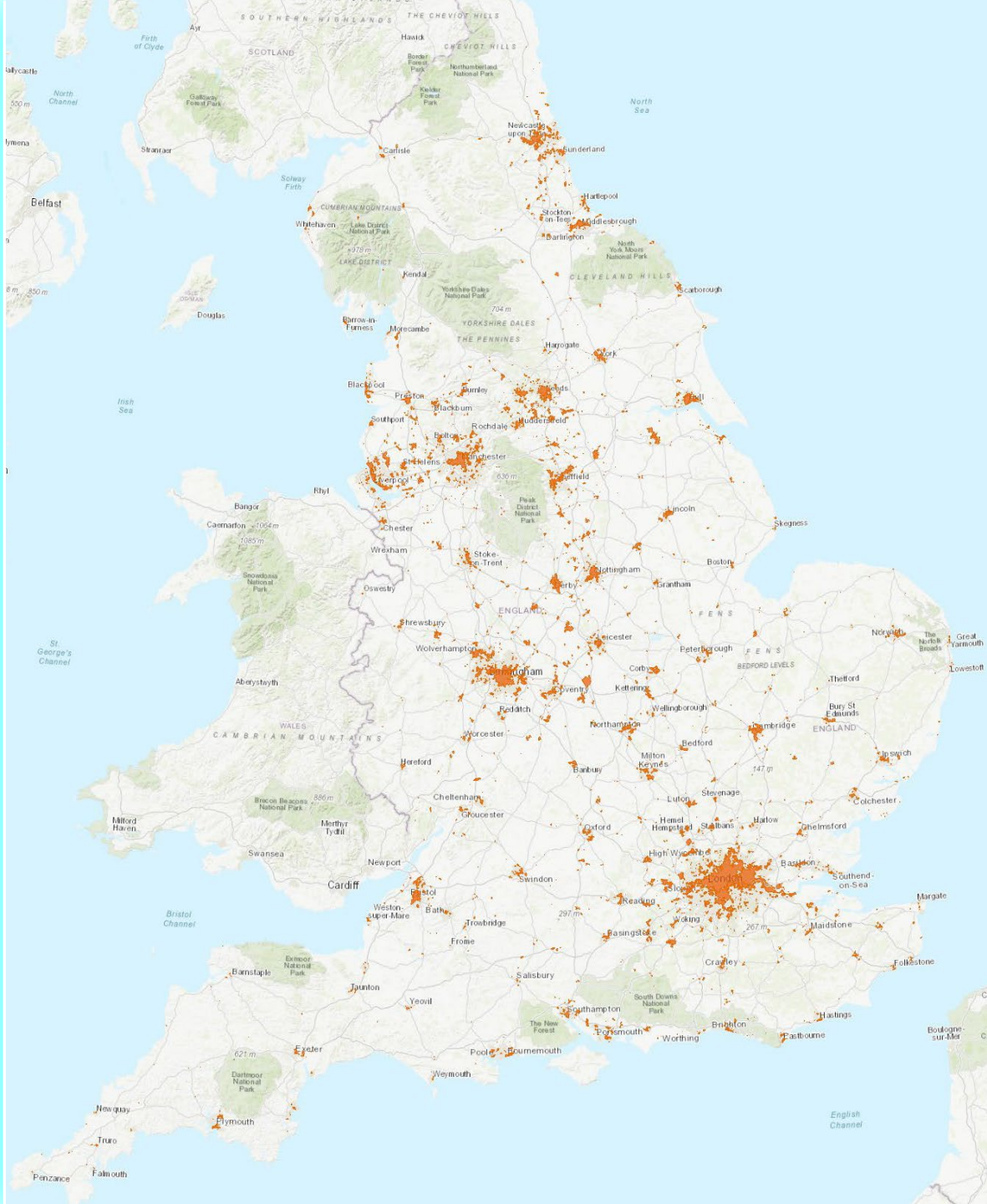
- Potential zones identified throughout England via a national methodology.
- Local refinement before zones designated.
- Zone information available via a digital portal.

What is the process via which zones will be built?

- Standardised routes for identifying heat networks developer in each zone.

What lessons can we learn from early pilots and activity?

- Advanced work to ensure initial batch of zones are in construction by end 2025.



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Timeline/next steps

Milestone	Date
Initial market framework regulations introduced	Spring 2024
Technical standards consultation	Summer 2024
Further market framework consultation	Autumn 2024
Zoning regulations take effect	2025
Initial market framework measures take effect	2025
Technical standards regulations take effect	2025
Full requirements on pricing and guaranteed standards	2026

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Heat Network Technical Assurance Scheme (HNTAS)

HNTAS Policy Introduction

23/04/2024

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Content

1. Why technical standards regulation?
2. HNTAS vision and principles
3. Proposed governance structure
4. Scheme characteristics
5. Assessment and certification (new build)
6. Operation and maintenance (new build)
7. Legacy networks
8. Engagement and next steps

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1. Why introduce technical standards regulation?

Introducing technical standards regulation

- In 2020, BEIS consulted on developing a regulatory market framework for heat networks to protect consumers, support market growth and develop low carbon networks.
- Strong support was received from respondents to introduce mandatory minimum technical standards, and for heat network suppliers to demonstrate compliance with technical standards through an accredited certification scheme.
- Support received for regulatory standards to build on CIBSE's CP1(2020) voluntary standards

Poorly designed, constructed and operated heat networks often have poor outcomes.

- Technical standards regulation aims at –
  - improving network performance
  - improving consumer outcomes
  - enhancing reliability
  - lowering the cost of heat
  - reducing carbon emissions

Improving performance and reliability

- Some common issues which mandatory technical standards will address include -
  - Uncontrolled flows and bypasses causing energy inefficiencies
  - Poor water quality causing corrosion and failures
  - High return temperatures causing reliability issues
  - Overly complex heat network systems causing reliability issues

Addressing each of these has the potential to lower long term costs.

- For new build systems, regulation aims at avoiding these issues from the outset.
- For existing systems, regulation aims to rectify these issues over time.

Poor water quality causes corrosion

Progress to date

- DESNZ has been developing HNTAS for the last 18 months, building on CP1 (2020)
- Work led by Technical Author ‘Fairheat’ in partnership with ‘Gemserv’
- Draft technical code will set out mandatory minimum technical requirements and processes operators will need to undergo to demonstrate compliance. Requirements have been developed with stakeholders and include meeting certain levels of flow temperature stability, or heat network losses, for example.
- For new networks to gain authorisation to operate, or for existing networks to retain authorisation to operate, they must demonstrate compliance with the technical code.
- As with other market framework measures, technical standards will start to come into force in 2025.

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2. Vision and principles

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Scheme vision, aim, objectives and core principles

VISION

Enable low emissions, and reliable and affordable heat to be delivered to UK communities via heat networks

AIM

Develop a heat network technical assurance scheme that ensures a minimum level of performance and reliability for heat networks in the UK

OBJECTIVES

- Reduce carbon emissions by making heat networks more efficient
- Improve affordability by reducing capital and operational costs
- Improve consumer experience with improved reliability and quality of heat supplied
- Improve reputation and investor confidence in heat networks
- Build evidence by better reporting of information about technical quality

CORE PRINCIPLES

Outcomes orientated | Preventative | Proportionate | Deliverable | Adaptable | Enforceable

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Core principles

Core Principle	Definition
Outcome Orientated	Focused on performance outcomes rather than process.
Preventative	Focused on preventing performance issues from arising through identification of issues, rather than taking punitive approach
Proportionate	Balance the effectiveness of assurance process against the cost of compliance
Deliverable	Based on established processes, that fit with existing contractual and delivery processes, taking into account market capacity and regulatory framework
Adaptable	Able to adjust approach as market moves down the experience curve and adapt to wider changes at a regulatory and industry level
Enforceable	Sets out clear rules and consequent required actions in the case of non compliance that are able to be enforced.

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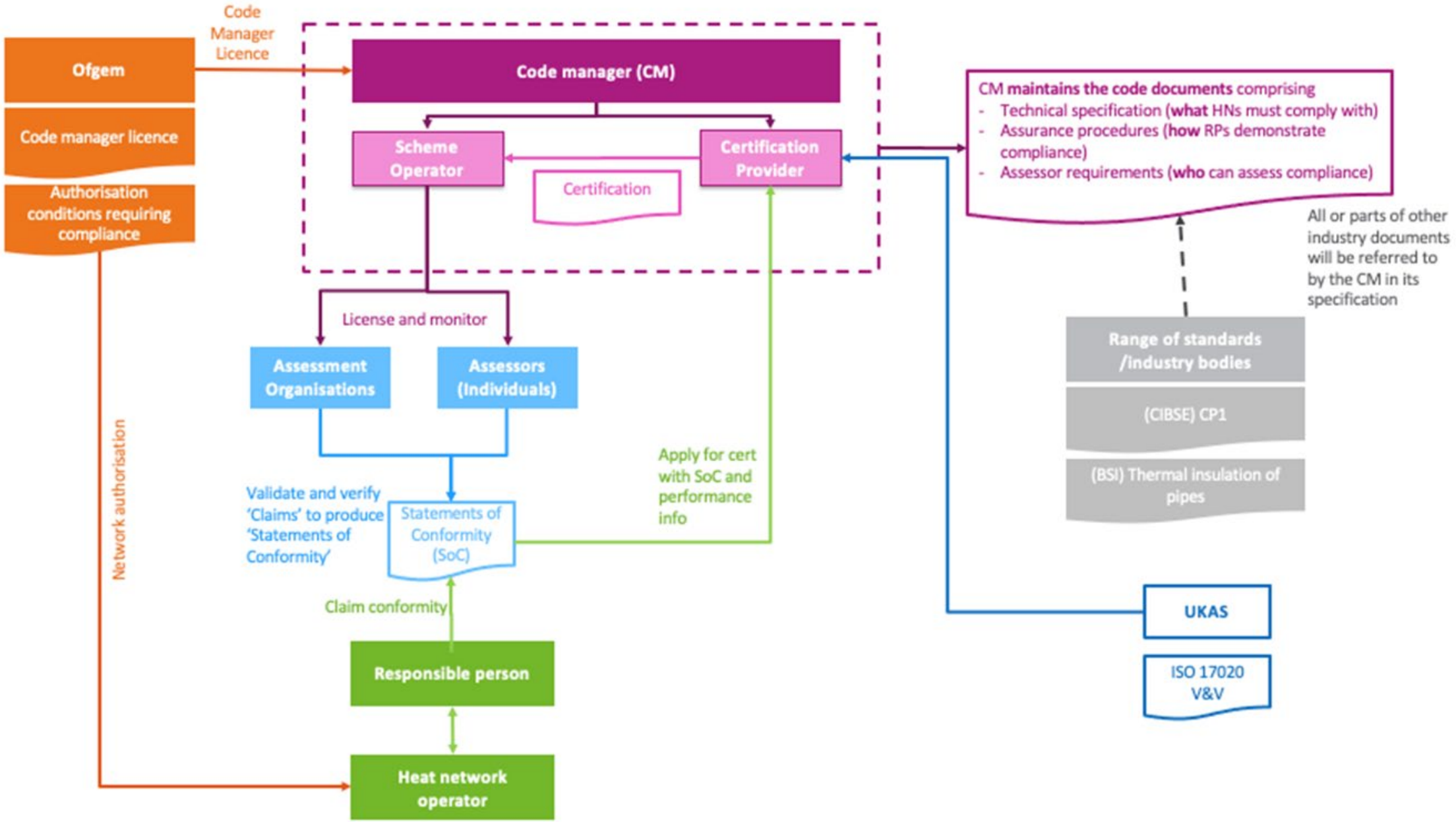
3. Proposed governance structure

Proposed HNTAS Governance Structure



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4. Scheme characteristics

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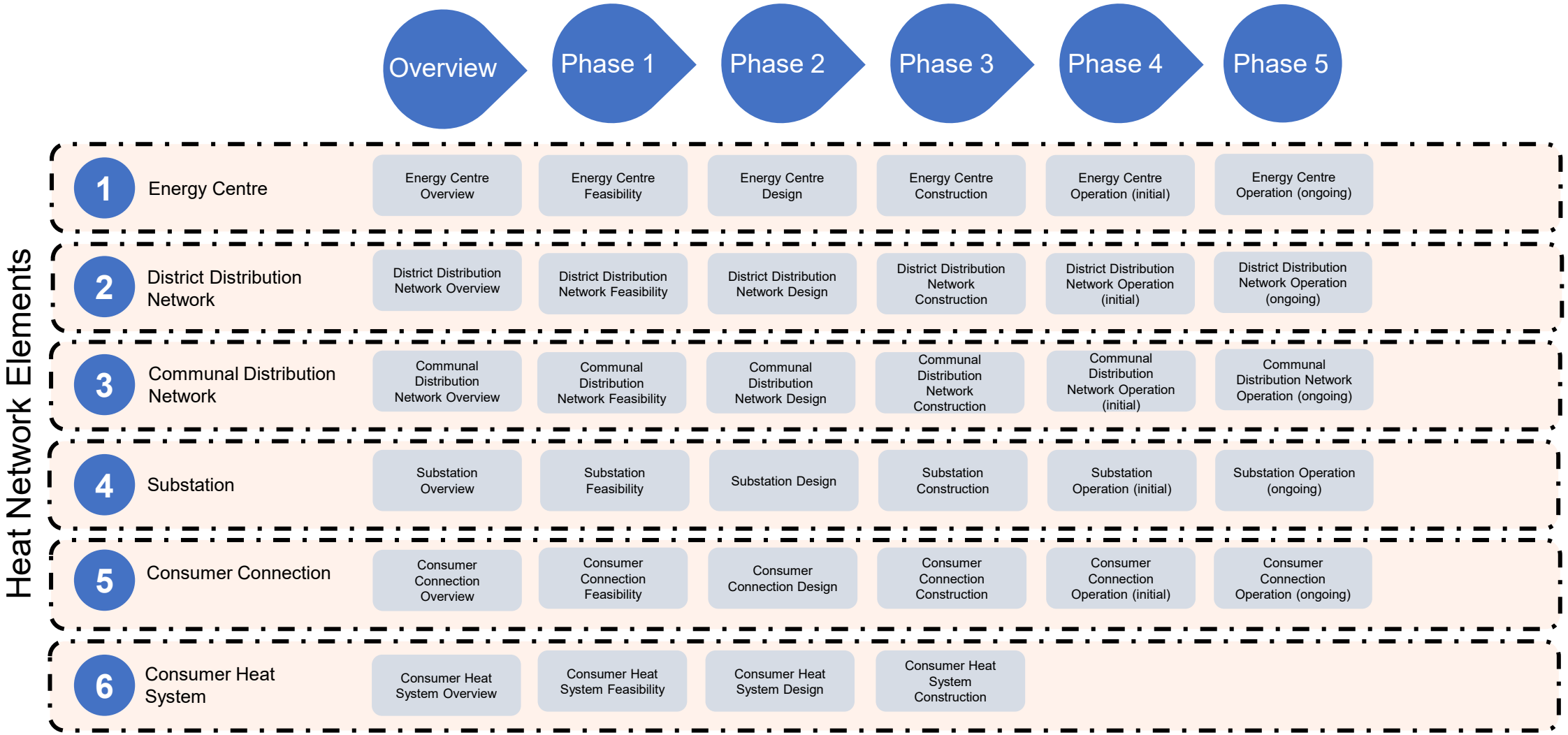
Six distinct elements within assurance scheme

1	Energy Centre	Source of thermal energy
2	District distribution network	Distribution pipework that enables the transfer of thermal energy from the energy source to end consumers
3	Communal distribution network	
4	Substation	Connection between distribution networks
5	Customer connection	Connection to the end consumer
6	Customer heat system	Heating, cooling and hot water systems within the consumer

Technical specifications for each element at each phase



KPIs/ tech standards mainly based on CIBSE CP1(2020) with other industry standards and engagement inputs

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Stakeholder Engagement

- Extensive series of technical sub-working groups to focus on the development of normative/code documents
- 25 technical sub-working group workshops, bringing together 69 stakeholders from 44 diverse organisations
- Manufacturers, Housing Associations, Local Authorities, consultancies, developers, contractors, ESCos, Trade Associations, and professional bodies.
- This industry engagement will continue with a consultation in Summer

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Scheme Characteristics

- Performance based assurance scheme – independent assessment of claims made by a responsible party as to whether minimum standards:
    - Will be achieved – Validation
    - Have been achieved – Verification

…for identifiable elements of a heat network

- In order to ensure that certain performance outcomes are achieved
- …and maintained
- With Certification that performance outcomes have been achieved at the end of commissioning and at the end of an initial 2-year operation period

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5. Assessment and Certification (new build)

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Rationale behind Assurance Scheme structure

- At end of build process, Ofgem require binary yes/no decision at handover as to whether technical standards have been met to inform authorisation of supply of heat
  - Demonstration that heat network performance meets KPI thresholds (Outcome focus)
  - Certificate issued (ideally by independent 3rd party Certification Organisation)
- Risk that current market practices would lead to a proportion of networks failing to meet certification requirements at completion. Strong desire to ensure that networks do **not** fail to gain certification.

Therefore, need structure in place to ensure right decisions are being made at the right times during the development of a heat network

- Validation of design (that will deliver KPIs)
- Verification of installation and commissioning (in line with design, workmanship etc to deliver KPIs and avoid key failures)
- Both 2nd and 3rd party assessor organisations able to carry out assessments, with clear impartiality rules

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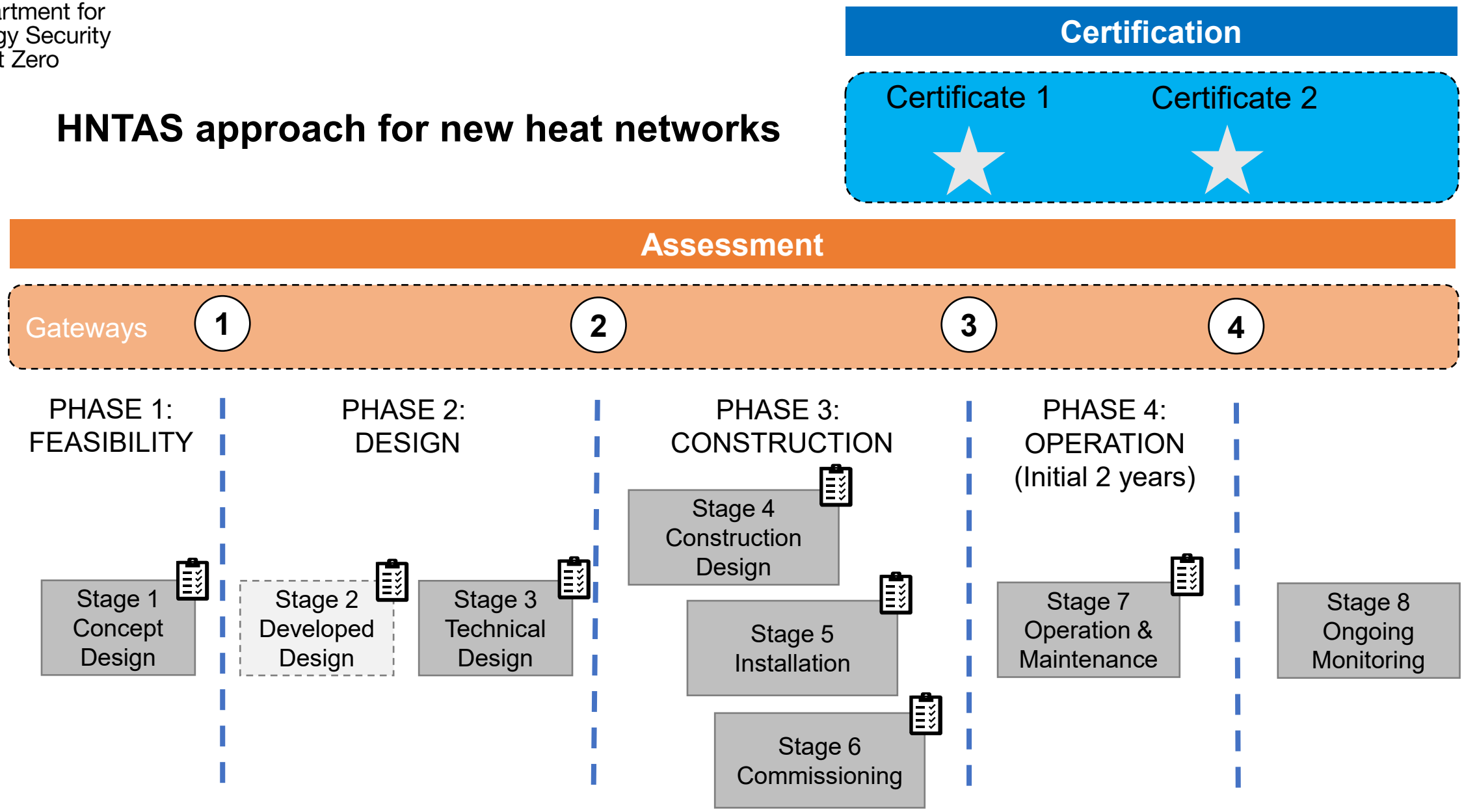
HNTAS approach for new heat networks



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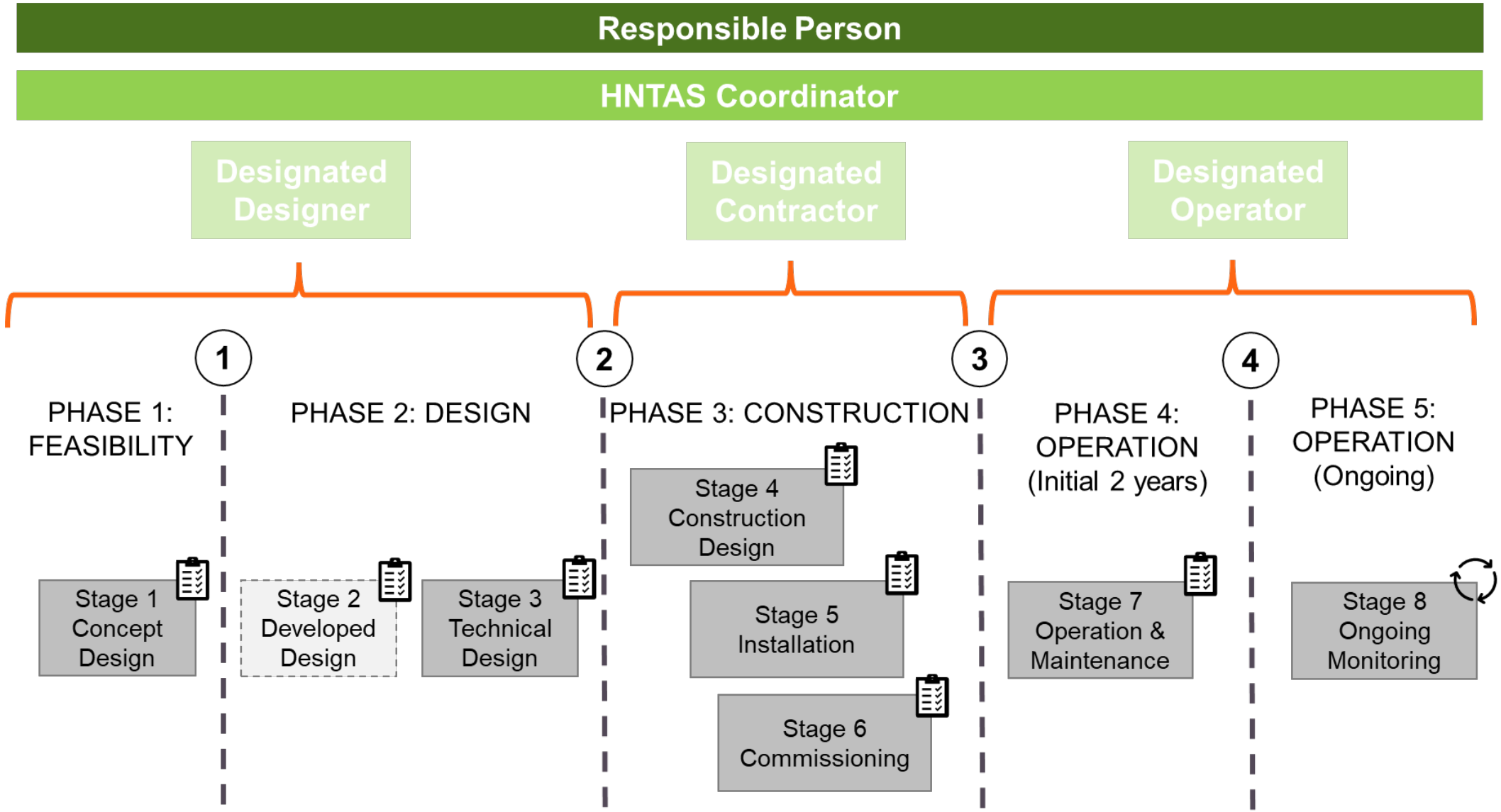
Duty holders



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Certification would focus on 3 things

1. Evidence that requisite duty holders (including Assessor) in place throughout process (similar to Building Safety Act)

2. Requisite Conformity Statements in place

3. Evidence network meets requisite performance requirements (KPIs from Acceptance Testing)

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Key benefits of approach

1. Have 3rd party certification of scheme performance
2. Certification relatively simple and should be relatively easy to establish, with ability to use standard certification organisations (lower technical knowledge requirements)
3. Should ensure that networks pass certification
4. Give access to a larger pool of assessors to draw on
    a) Would allow 2nd party assessors (e.g. ESCO adoption in certain circumstances)
    b) Flexibility on impartiality and advisory
5. Ability to modify the assessment element over time, without disrupting certification mechanism

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6. Operation and Maintenance (new build)

Operational phase after certification – exceptions based reporting approach

Exceptions based reporting

Regular independent inspections

Requisites/Model:

- Good quality metering and data capture
- Systems dependent
- Central audit function in case networks outside parameters
- Assessors to carryout audits (framework)
- Centralised assessment costs

...with an initial "soft landing" for first two years

Exceptions based reporting

- Most network issues normally manifest in first few years
- Will often be snags present that are not closed out
- Seasonal commissioning normally required in order to stabilise long term performance
- Need to ensure correct O&M processes in place

Regular independent inspections

Model:

- Assessment milestones at 12 and 24 months
- Assessors to carryout audits (HNTAS)
- Assessment to cover both performance and process (e.g., PPM records)
- HNO pays for assessment

Ongoing Certification will transition to Assessment to Monitoring once there is sign-off on O&M

- HNTAS assessment process for new networks to cover an initial period of 24 months to get a Stage 7 Certification:
  - Verification of performance (data) and that O&M activities are in line with standards
  - Inspection
- Ongoing exception-based monitoring of KPIs (Stage 8) through a single shared portal – HNO would have one point of contact
- Ongoing audits involving HNTAS Assessors (engaged by HNTAS):
  - In the case of performance being outside parameters
  - Random audits
- Periodic audits of networks within [5] years, in the case that no other audit has been carried out (maximum time limit on checks)

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6. Legacy Systems

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Existing Legacy heat networks

- will find it harder to meet minimum standards

- Two-stage transitional approach
  - Require minimum levels of metering and monitoring to be installed
  - Require reporting within a relatively short period
- Set a minimum threshold performance that all heat networks must meet within a relatively short period
- Require heat network operators to submit a Heat Network Improvement Plan
  - Setting out how they will achieve certification within a set period following the installation of metering
- Require certification to minimum standards within set period (longer timeframe)
- Different approach proposed for networks installed prior to 2015 and those post-2015
  - When the heat networks metering and billing regulations came into force
- Prove in-use performance after 2 years operation based on real data

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Tentative timeline for legacy networks

2015 or newer networks

Milestone	Year	Requirement
Milestone 1	1	Register heat network
Milestone 2	3	Demonstrate meeting minimum metering & monitoring requirements, including dwelling metering Demonstrate meeting threshold performance
Milestone 3	3	Submit Heat Network Improvement Plan (to reach certification)
Milestone 4	6	Certification 1
Milestone 5	8	Certification 2 (O&M)

2014 or older networks

Milestone	Year	Requirement
Milestone 1	1	Register heat network
Milestone 2	3	Demonstrate meeting minimum metering & monitoring requirements, with full plantroom and network monitoring and reporting. Demonstrate meeting threshold performance
Milestone 3	4	Submit Heat Network Improvement Plan (to reach certification)
Milestone 4	8	Certification 1, including metering & monitoring for all end user connections
Milestone 5	10	Certification 2 (O&M)

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8. Engagement and next steps

Conclusions

- Significant change is coming in 2025 as the sector transitions to a regulated heat network market
- Setting minimum technical standards is a key part of this
- Assessing and certifying heat networks that meet the minimum standards will raise performance throughout the sector
- Engagement with stakeholders is key to achieve consensus and buy-in for the assurance scheme
- An assurance scheme will give network developers and operators confidence to invest in the sector
- HNTAS is being designed to dovetail into the whole future regulatory framework, including heat network zoning
- Pilot phase across 2024 will test HNTAS in practice on real networks to test the overall scheme
- Before final implementation in 2025

Potential opportunities for...

- **Assessors** – commercial market for services
- **Owners, operators and ESCo's** – to improve performance
- **Designers** – to improve heat network performance in design
- **Heat consumers** – improved reliability and service levels
- **Social landlords and local authorities** – to provide more affordable heat
- **Government** – to encourage growth in the sector and meet carbon emissions targets
- **Investors** –heat networks become more investable, offering commercial opportunity in this growth sector

Next Steps

- First phase of HNTAS development (draft of normative documents, procedures and processes) almost complete
    - DESNZ aims to publish these normative documents in some form in 2024
- HNTAS consultation in summer 2024, secondary legislation to follow
- HNTAS piloting throughout 2024
- DESNZ is currently working to put a ‘Shadow’ Service Provider and Code Manager in place, to set up early governance structures to oversee pilots
- Plans to update CIBSE CP1 across 2024 are being put in place, to ensure alignment
- Implementation in 2025

ofgem Making a positive difference for energy consumers

Heat Network Regulation

10 April 2024

Richard Bellingham

- Ofgem and DESNZ consulted on consumer protection policy late in 2023
- In many of the subject areas the consultation asked very open questions of stakeholders – call for evidence
- Excellent response from stakeholders – over 100 responses
- Gives Ofgem and DESNZ a basis on which to develop policy further
- Response to consultation to be published very soon

- Policy development underway
- Planning consultations for later in 2024
- Will give more detail on policy and process proposals
- Presentation today gives you a flavour of some of the things we are thinking about
- Sharing ideas with ESAG – External Stakeholder Advisory Group
- Nothing is settled – your response to consultation is important

- Authorisation
  - Existing HNs and New HNs
    - Existing HNs
      - Supplier and Operator of existing HNs will be deemed authorised from date of go live
      - Conditions of authorisation will apply from the date of go live
      - Obligation to register on Ofgem IT system and enter details of the legal entity
    - New HNs
      - Will be an application for a legal entity to supply and operate a HN
      - Present some information about the HN and processes in place to meet requirements of authorisation conditions
      - In BAU will require evidence of HNTAS certification

- Authorisation
  - Level of authorisation
    - An authorisation needs to contain details of
      - the legal entity
      - the activity which they are authorised to carry out
      - the HNs to which this authorisation refers
    - At the level of legal entity
      - Single authorisation for a legal entity
      - Then supply and / or authorisation in respect of HNs

- Authorisation
  - Supplier and Operator definition
    - Supplier
      - Legal entity with the contract / agreement with the customer to supply heat
      - Control over terms of the contract
      - Sets the price of the heat, bills and collects payment
      - Responsible for customer service and support
    - Operator
      - Control over infrastructure – able to make decisions wrt to remedial works and upgrades to be made to the infrastructure
      - Legal entity responsible for day to day running of HN
      - Provides a reliable supply of heat

- Authorisation
  - Applications to amend authorisation
    - New HNs
      - Legal entity would need to apply to amend existing authorisation
      - Ofgem would require details of new HN
      - Whether application is for supply / operation or both
      - Evidence of ability to meet conditions of authorisation (declaration)
    - Phased build of HN / Extension
      - HN is extended and ready to supply heat to more customers
      - Another phase of HN is completed and ready to supply more customers

- Authorisation
  - Interim arrangements for HNTAS certification
    - In early days of regulatory framework certification may not be available – ie HNTAS will only just have been formed
    - Ofgem will have ability to grant authorisation with conditions attached that bind the applicant to gaining the certification by a future date
    - HNTAS also considering certification in respect of phased build – considering minimum certification of partial build allowing Ofgem to grant authorisation and the HN to operate.
    - Ofgem would require full certification to be evidenced on completion of the build

- Monitoring and Audit
  - Why monitor?
    - Operators and suppliers for HNs will be bound by conditions of authorisation
    - As a regulator we need comfort that these rules are being adhered to
    - Monitoring provides not only HN specific data but can be aggregated to identify problems by sector / company
    - Allows Ofgem to deploy resource to have maximum impact on consumer outcomes
    - In the early days of regulation it may provide evidence that some rules are not working and need to be revisited

- Monitoring and Audit
  - Level of monitoring
    - Likely to be at HN level
      - Customer experience can vary HN to HN
      - Need to be able to pick up on this
      - If monitoring was done at corporate level this level of granularity might be lost – ie high level of complaints in one HN would not be obvious

- Monitoring and Audit
  - What information will authorised parties need to provide?
    - At the moment uncertain but will be focused on providing evidence of good customer outcomes
      - Pricing information
      - Complaints
      - Reliability / technical
      - Customers in debt
      - Customers in a vulnerable situation

- Monitoring and Audit
  - Monitoring and IT system
    - Ofgem is working closely with the HNTAS IT team on development of the IT systems
    - Understand the benefits of having a common landing page for the two systems
    - Understand the benefits of submitting one set of data on one IT system which will be sued by both Ofgem and HNTAS
    - Aim to only collect the minimum information required
    - Will focus on numeric and binary data

- Monitoring and Audit
  - Role of audit
    - Data from HNs is from authorised parties…..
      - Ofgem need some assurance that the data is correct
      - Experience of HNMBR data collected by OPSS – not great
      - To introduce a program of audits
      - Random tranche and targeted tranche
      - Random tranche will cover different segments of the market
      - Targeted tranche will focus on cases where we have concerns
      - Scope can be targeted to segment of the market
      - Considering audit that covers both Ofgem and HNTAS needs
    - Extraordinary audit
      - On occasion we may have need to undertake an audit of bespoke scope – typically where we have a compliance engagement and we need a third party opinion to provide assurance

- Segmentation
  - We’re aware that the HN industry has a wide variety of players with different capabilities and characteristics
  - When developing a regulatory framework we need to develop something that works for all parties
  - Currently considering what those segments might be and whether we provide for different obligations or take a principles based approach and set out different expectations in guidance
  - We are acutely aware that there are a number of not for profit business models operating in the market

- Later in 2024
  - Aim to consult on
    - Authorisation application
    - Authorisation conditions
    - Monitoring and audit
    - Consumer protection
    - Step-in
    - Technical standards

ofgem Making a positive difference for energy consumers

Ofgem is the Office of Gas and Electricity Markets. We are a non-ministerial government department and an independent National Regulatory Authority, recognised by EU Directives. Our role is to protect consumers now and in the future by working to deliver a greener, fairer energy system.

We do this by:

- **working with Government, industry and consumer groups to deliver a net zero economy at the lowest cost to consumers.**
- **stamping out sharp and bad practice, ensuring fair treatment for all consumers, especially the vulnerable.**
- **enabling competition and innovation, which drives down prices and results in new products and services for consumers.**

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Session 1: Panel Discussion

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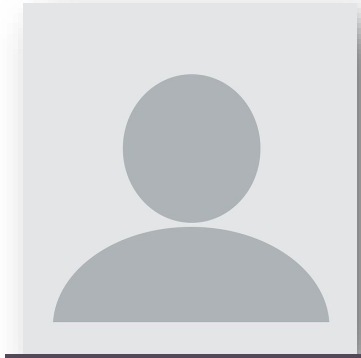

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