The Transition to Low-Carbon Heat

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#ERPheat

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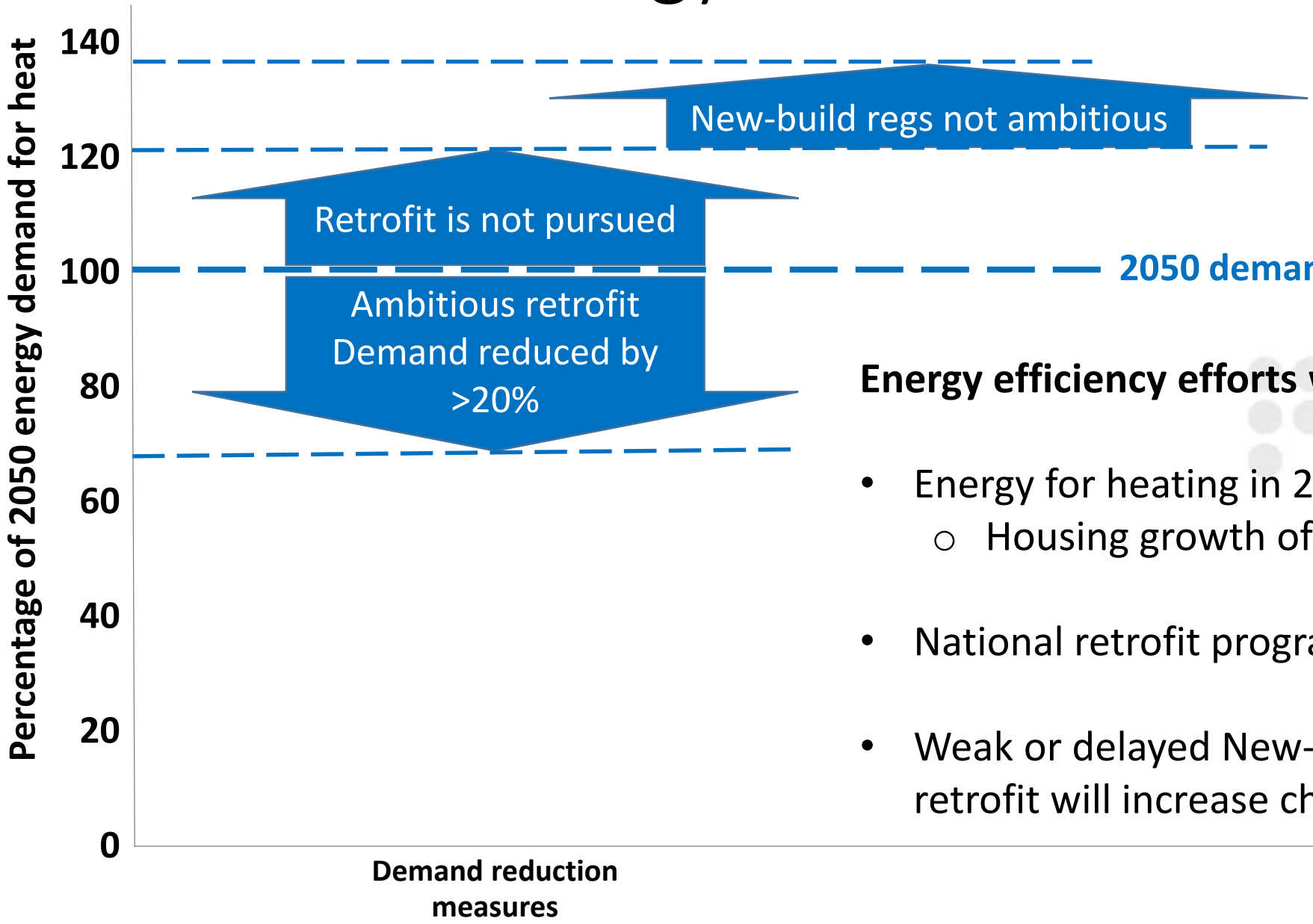
Objectives of the Transition

- Decarbonise heat, whilst meeting the carbon targets in 2050, and beyond
- Practical and socially acceptable
- Achieve at least cost
  - Reducing risks and avoiding unnecessary costs
  - Enable investments in technology and infrastructure development
  - Engaging with the public and consumers to enable effective choices

Challenges for the Transition

- Technical challenges of low-carbon heating options – understand/de-risk
- Social aspects – as challenging as the technical
- Coordination
  - National, regional and local priorities
  - Interactions with other energy sectors and related industries
- Timeframes – investment cycles, deployment rates

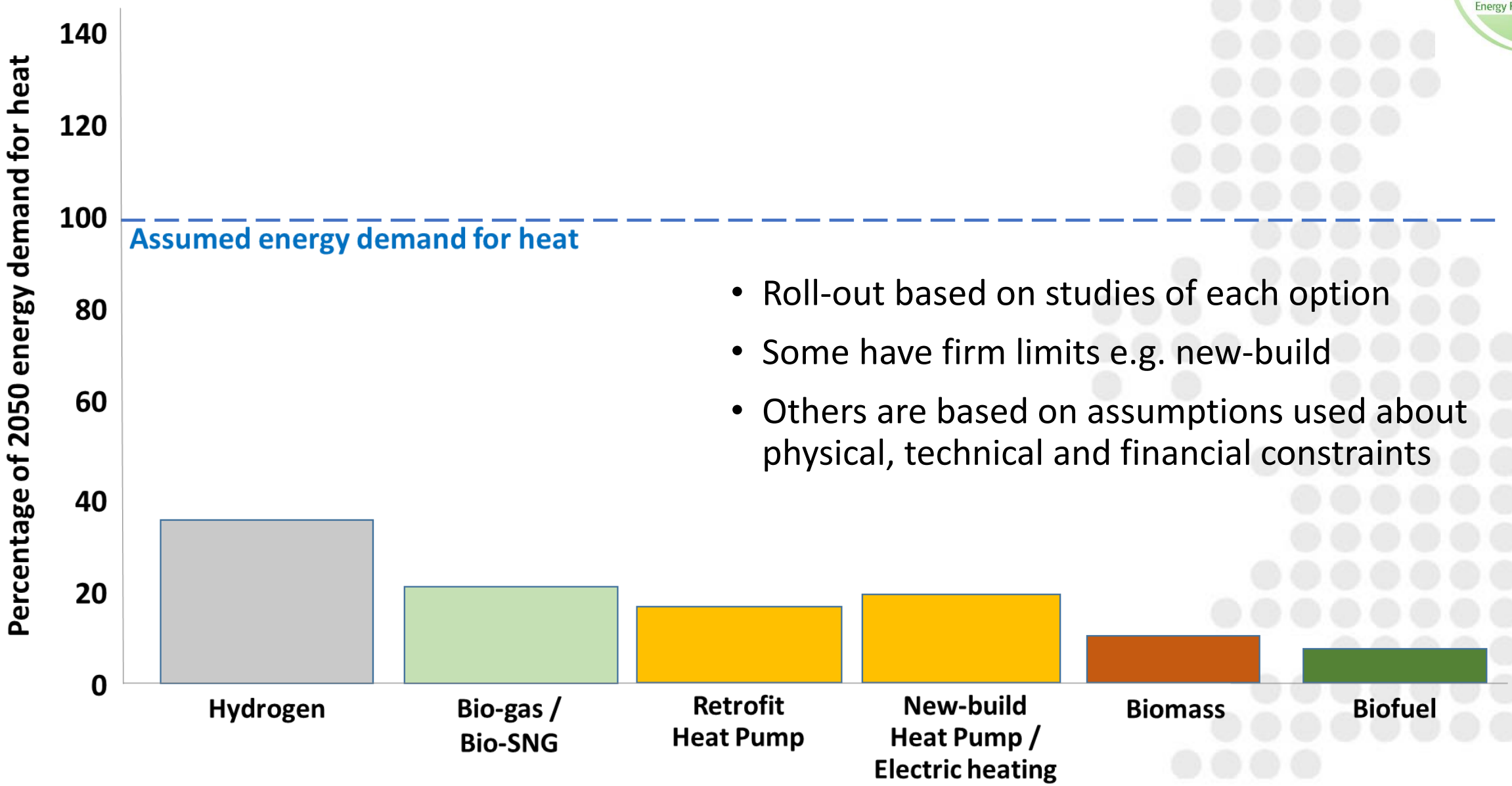
How much energy will be needed



Energy efficiency efforts will define the challenge

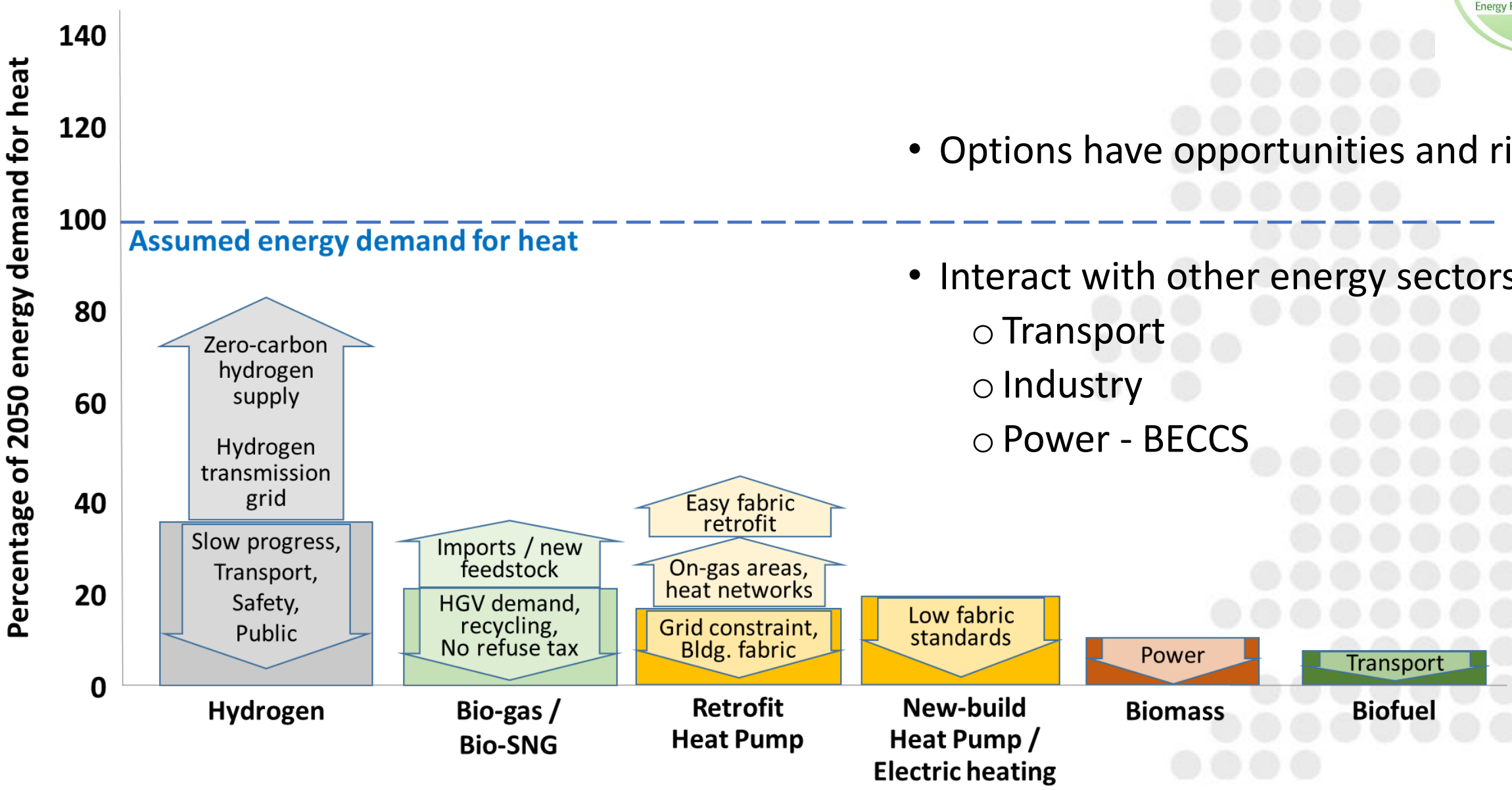
- Energy for heating in 2050 similar to 2015
  - Housing growth offset by efficiency ~20%
- National retrofit programme - reduce demand level
- Weak or delayed New-Build Regulations and/or retrofit will increase challenge

Supply options - Technical challenges



- Roll-out based on studies of each option
- Some have firm limits e.g. new-build
- Others are based on assumptions used about physical, technical and financial constraints

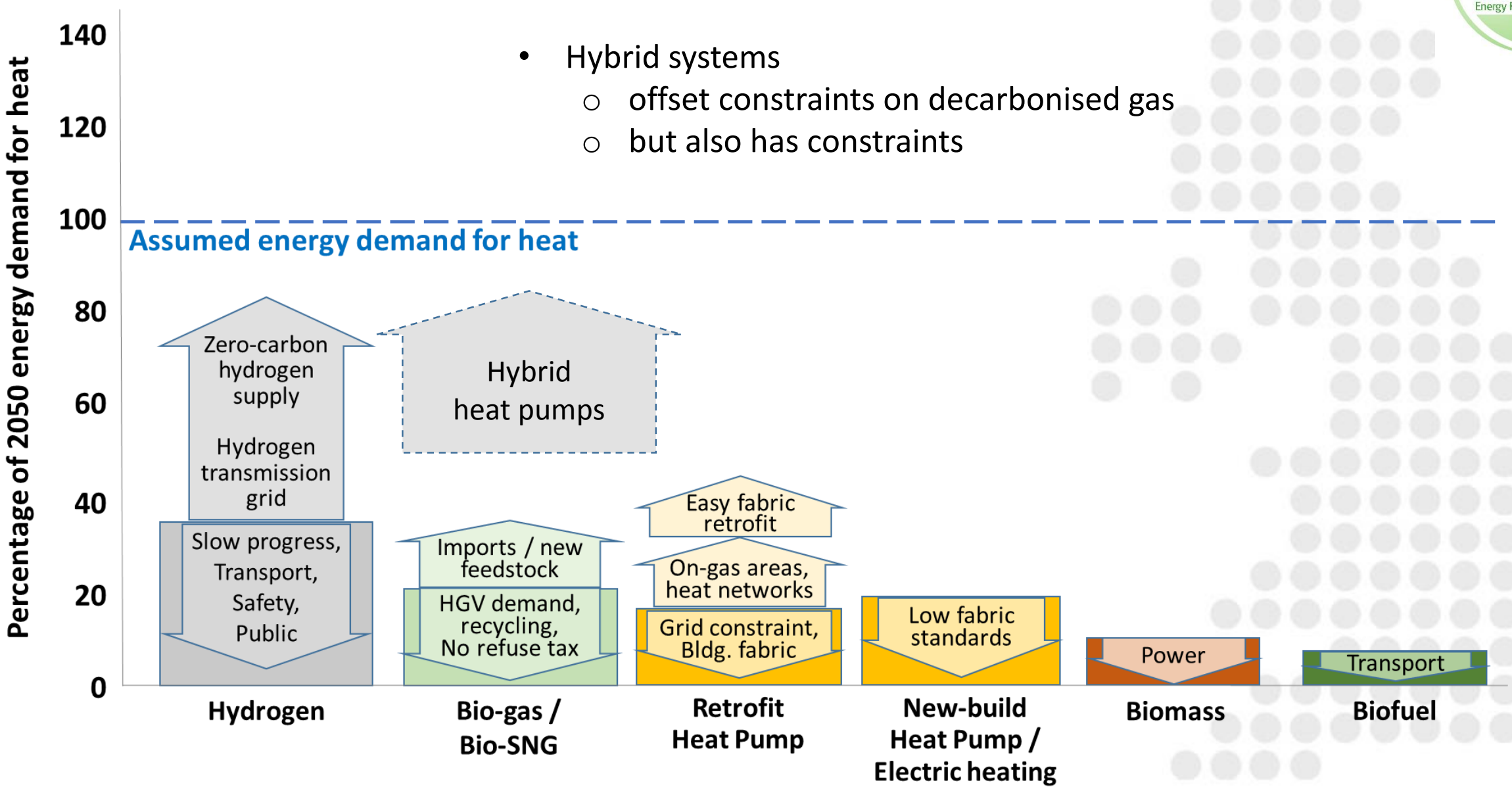
Opportunities and risks



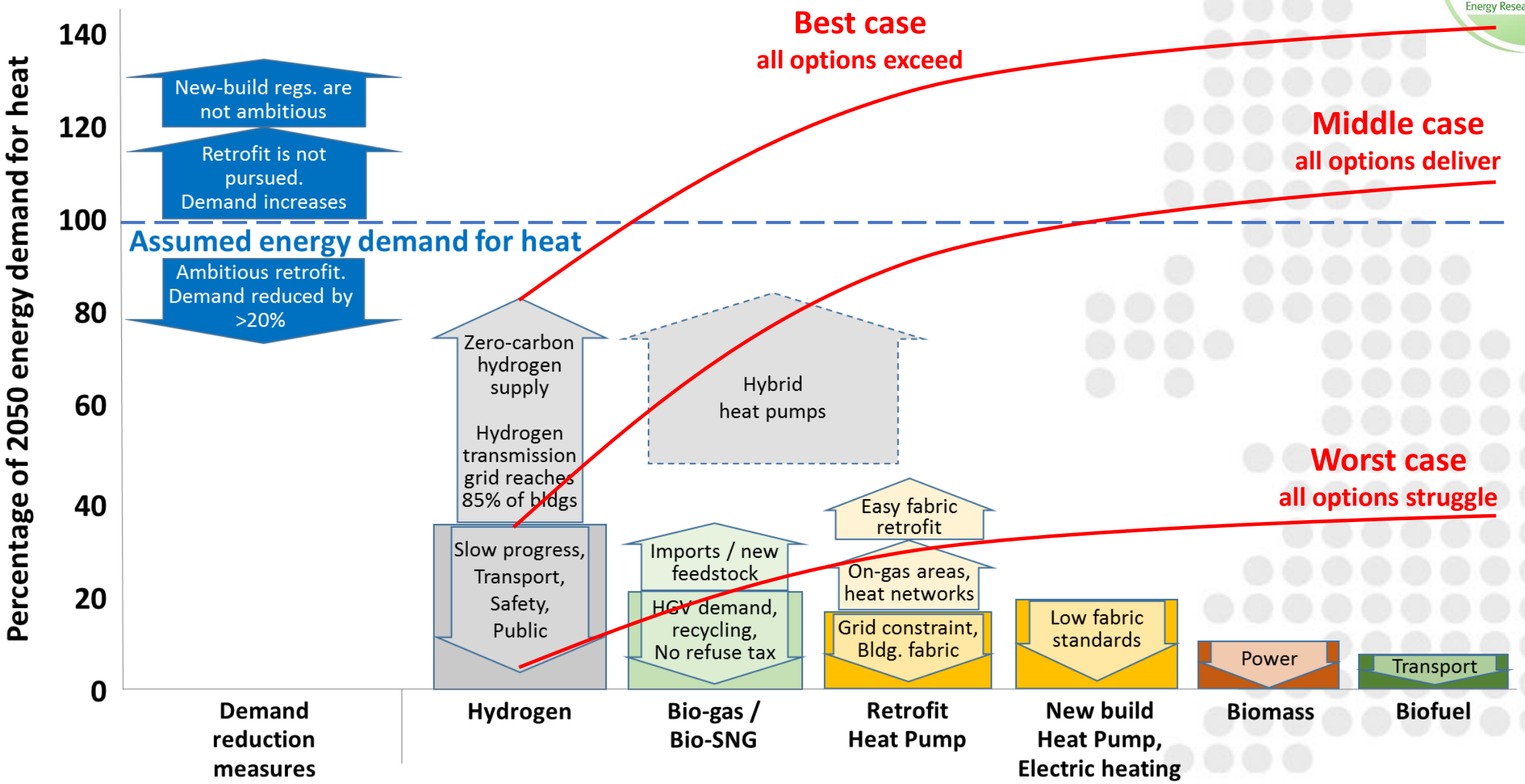
- Options have opportunities and risks
- Interact with other energy sectors
  - Transport
  - Industry
  - Power - BECCS

Cross vector options

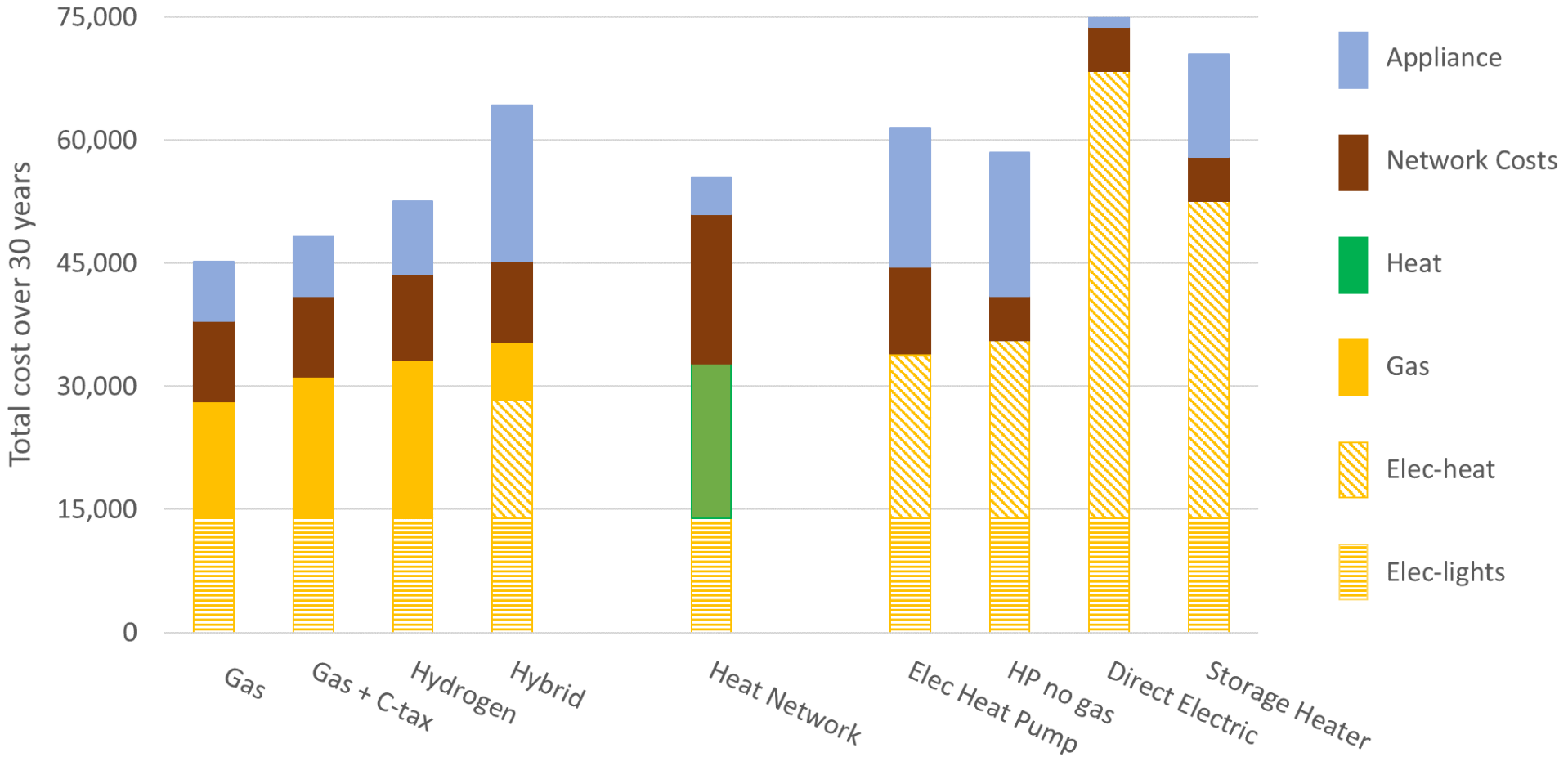
- Hybrid systems
  - offset constraints on decarbonised gas
  - but also has constraints



A single option may not dominate



Social aspects



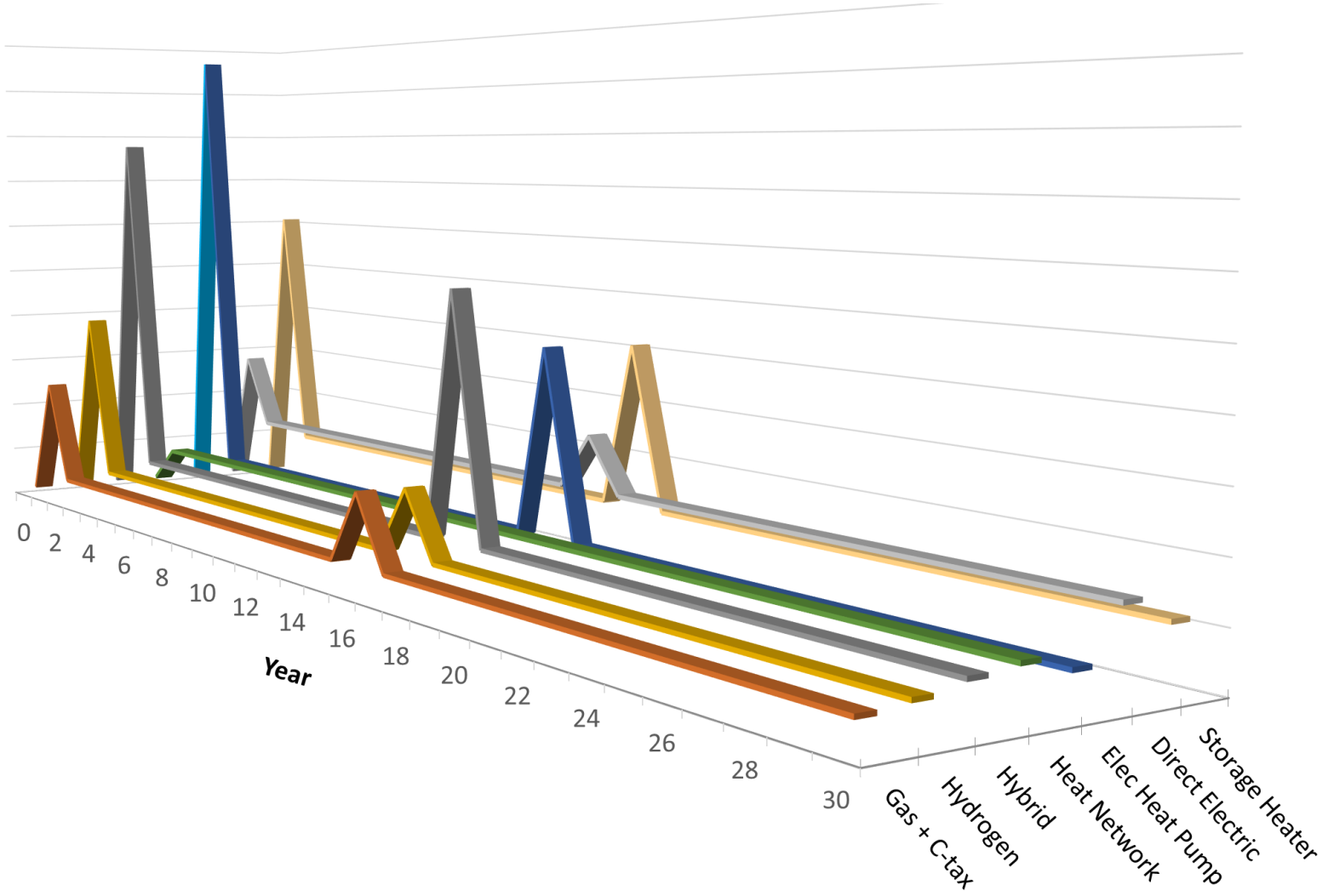
Disruption

- Change appliances
- Internal / external works

Economics

- Cost of heating will rise
- Cost profiles of options
- Cost reflectivity - choice

Cost profiles



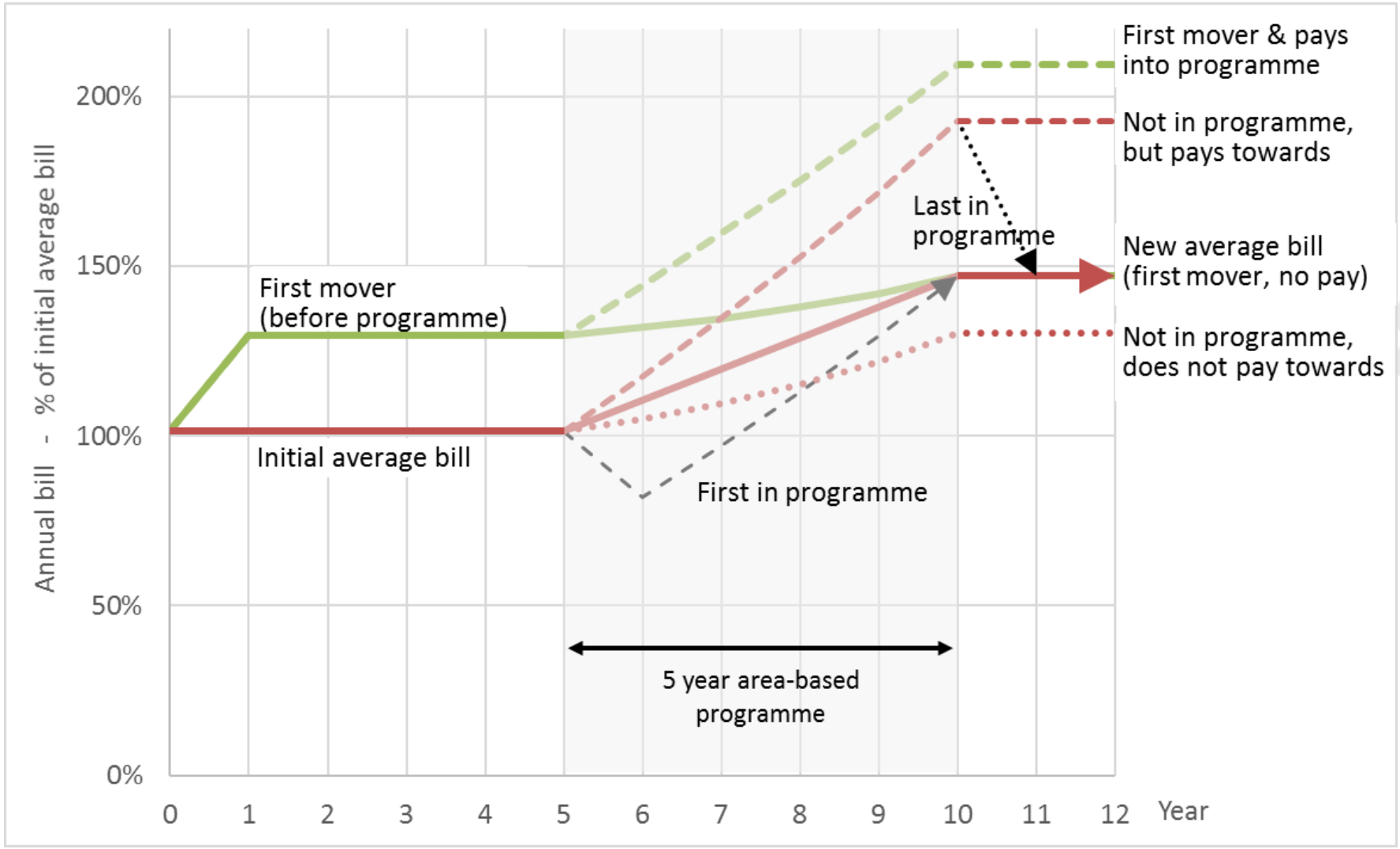
Cost profiles of options

- How address the hurdles?

Cost reflectivity – choice

- What impact do they have on the networks?
- How affect other consumers on the network?

Financial inequalities

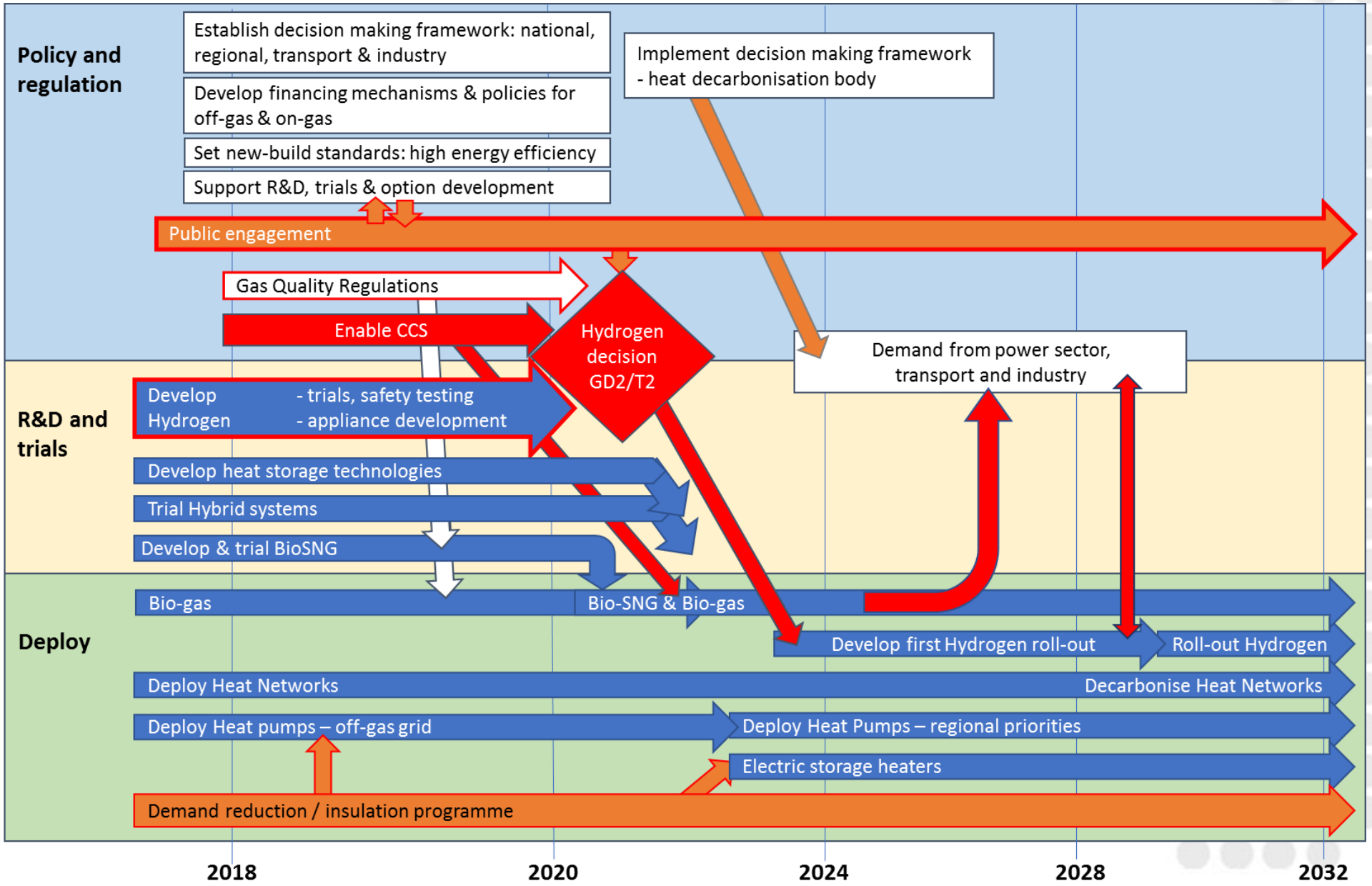


- First & last mover
  - Capital costs of conversion
  - Who pays?
- Regional / by option
  - Inequities already exist
  - Numbers affected may increase

Governance challenges

- Numerous stakeholders have a role in decarbonising heat
  - Government – national, regional, local
  - Regulator
  - Industry – networks, infrastructure, manufactures, operators, retailers, users, etc.
  - Other energy sectors – transport
  - Public / consumers
- Current decision making structures could lead to problems
- Timing, risks and options

Roadmap to the transition



Recommendations

Pursue several heating options, with critical decisions needed in early 2020s, to avoid increasing costs

- Critical - determine potential and costs of hydrogen. Enable Carbon Capture and Storage (CCS).
- In parallel:
    - Demonstrate and trial key technologies.
    - Deploy no-regrets options.
    - New-build - Set high efficiency standards
    - Existing buildings - Robust national energy efficiency programme.

Early public engagement. Develop financing mechanisms to address social & distributional impacts

- New narrative is needed - cost of providing heating and hot water will increase.
- Determine how to address distributional impacts.

Transition needs long-term strategy with a clear decision-making framework

- Integrate decarbonisation across heat, transport, industry and power.
- Establish heat delivery body - facilitate decision-making & coordinate national, local and commercial interests.
- Early engagement with public – combined with a clear narrative