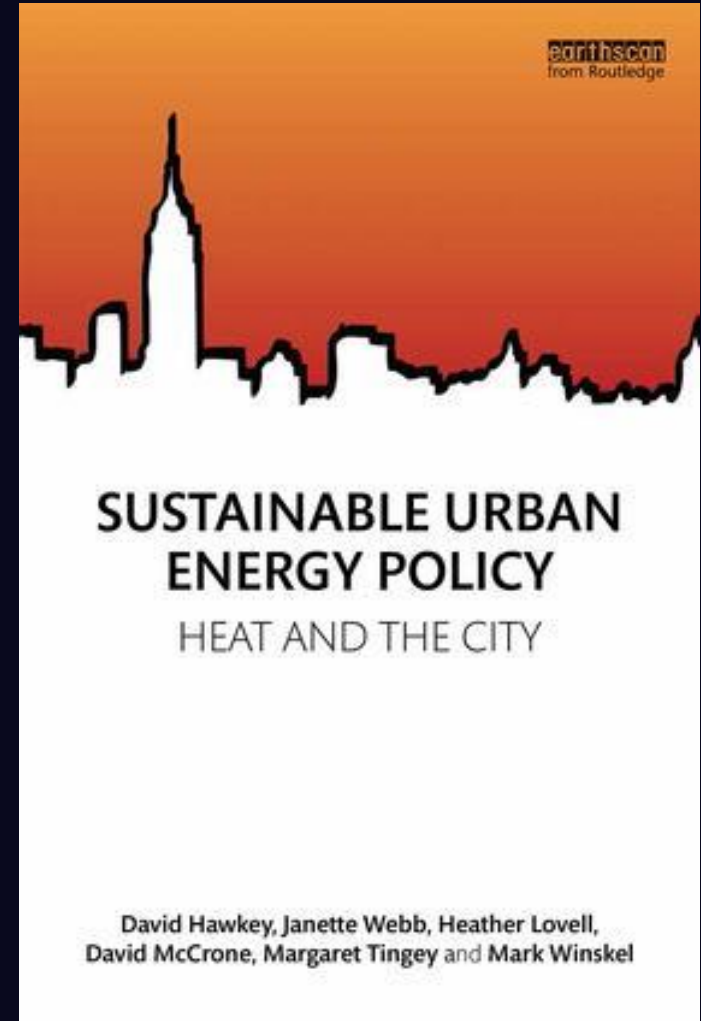




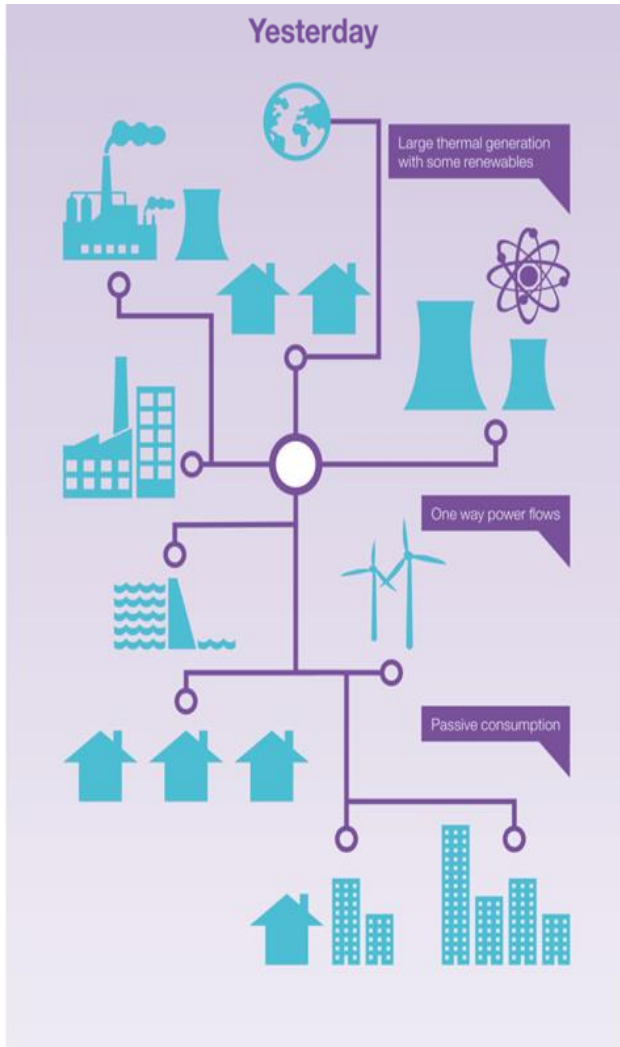
THE UNIVERSITY *of* EDINBURGH



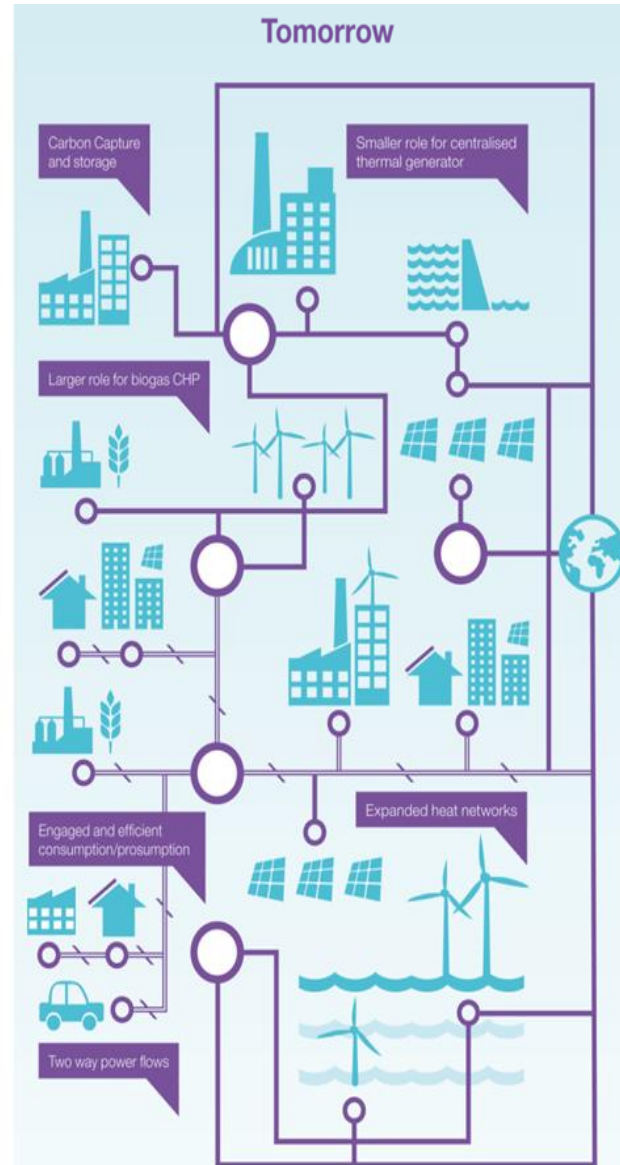
# DISTRICT HEATING IN THE UK: TOO LOCAL?



# LOCAL / COMMUNITY / LOW CARBON ???



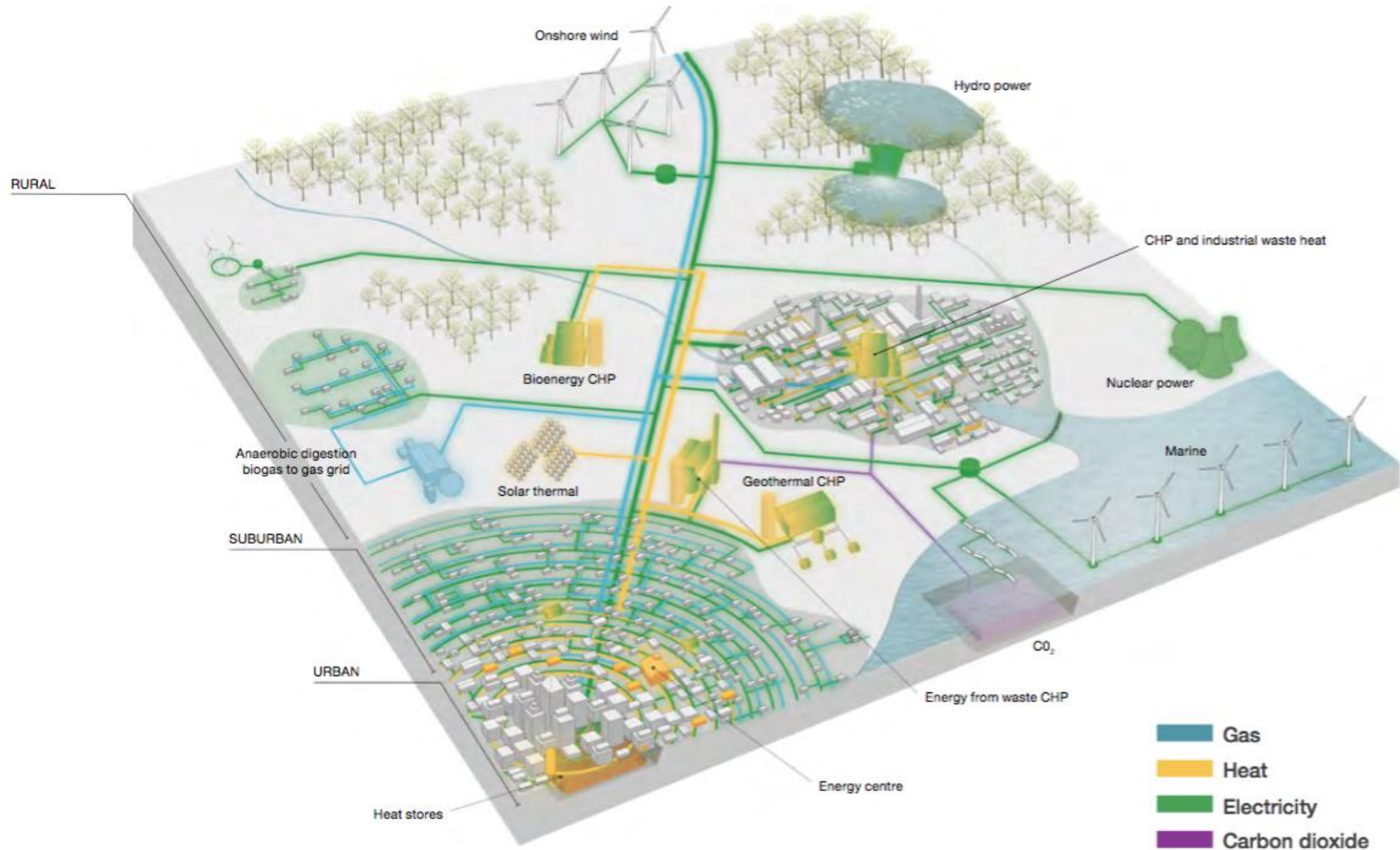
Source: Realising Transition Pathways



- Networks of interdependency vs energy autarky
- Multi-scalar systems
- Big is also beautiful
  - Variety
  - Flexibility
  - Resilience
  - Balancing



# VISIONS OF DISTRICT HEATING





# GROWTH OF HEAT NETWORK POLICY

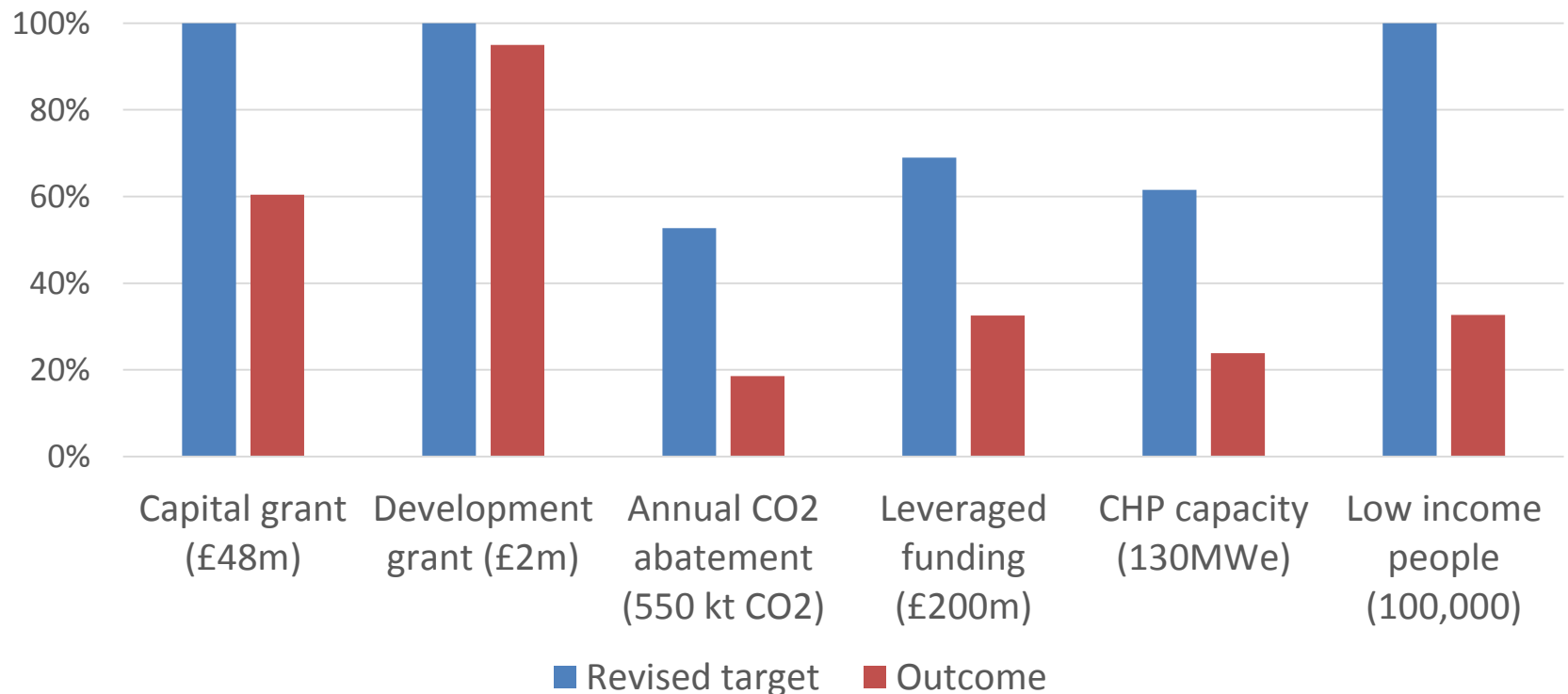
- Many conditions to support successful diffusion in place/emerging
  - Central support services and knowledge resources
  - Forums for knowledge exchange and networking
  - Emerging standards-raising industry initiatives
  - Capital funding





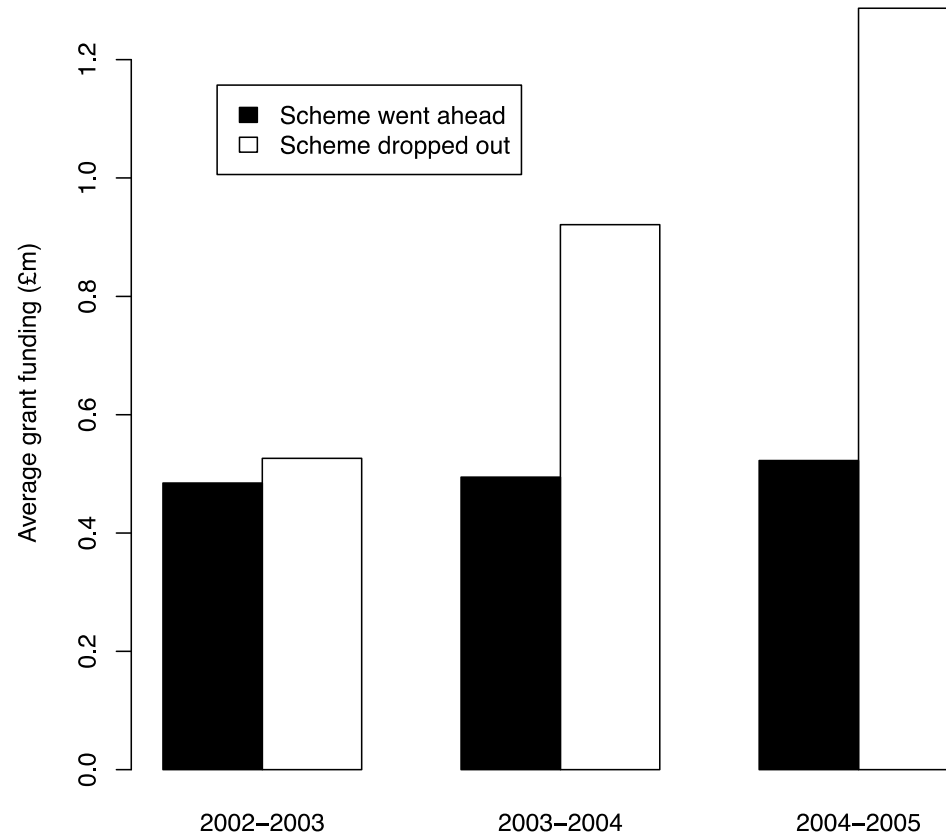
## DISTRICT HEATING PROGRAMMES OF THE PAST

- Community Energy Programme (established 2001)
  - £50m development and capital grants (up to 40%)
  - £10m extension 2004
  - Cancelled in 2006
- A successful failure





# LARGE PROPOSALS FAILED TO DEVELOP





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## PIECEMEAL AND FRAGMENTED

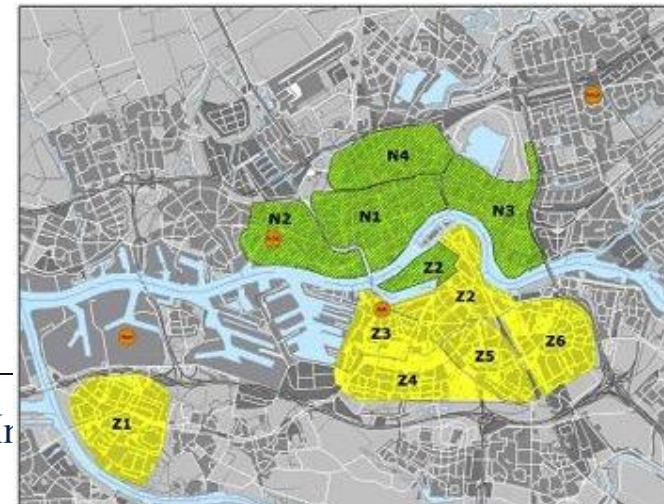
- *“The smaller schemes that can complete tend to be expensive in relation to their outputs.”* (UK Govt 2006)
- Coordination difficult under stop-go policy support
- UK heat networks tend to connect buildings under control of single organisation





## DISTRICT HEATING DEVELOPMENT ELSEWHERE

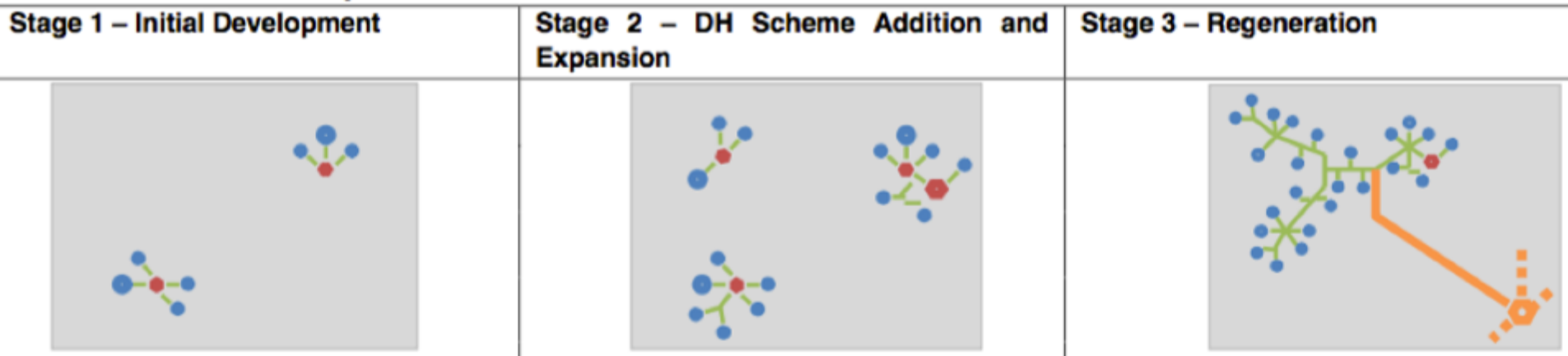
- *District* scale heat networks solve a problem confronting an organisation...
  - Local govt (20<sup>th</sup> C): modernisation, oil dependency
  - Producers: environmental regulation, market slump
- ...which is able to build out to a broad, long-term user-base.
  - Municipal integrated infrastructure development
  - Zoning to protect viability of planned network
- Contrast with UK
  - User-specific objectives dominate
  - Voluntaristic model of coordination





# RISKS OF FRAGMENTATION

## Cluster Network Development Model



- Local authorities' influence over other organisations is limited
- GHG emissions a weak driver and understood corporately
- Joint schemes that have not progressed have fallen back to neighbouring campus schemes
- Buildings and campus-networks reframed as assets
- Large heat loads “cherry picked” rather than anchor growth

Because [the grant funder] is giving the cash to ourselves it needs to be ring fenced around, [they] can't be giving us money to enable somebody else

The NHS have their system and we have our system here and there's [x] million pounds worth of interconnection [...] in between them, who is going to pay for that? That's an interesting question.

you know, we don't naturally sit together and all meet every week [...]. So somebody has to bind all those people together, and you have to *bind* them together, because... If this was a no-brainer, it would have happened by now

- Local authorities' in
- Commissioning a weak driver and und
- [A freedom of information request could reveal] you were paying x before, now you're paying x+10, who thought that was a good idea? Then your name's all over the papers about squandering...
- ...
- ...
- ...

It's 12 banks that are financing [the hospital] ... they do not wish to see any change in their risk profile ... because they obviously... they're buying into an income stream



- Many conditions to support successful diffusion in place/emerging
- *District* heating decision making as a ‘hot potato’
  - Weak alignment of organisational objectives with area-wide systems
  - Means of collaboration are elusive
- What changes will create “problem owners”
  - for whom the absence district heating is a *significant problem*
  - and who have *adequate capabilities* to coordinate users?