Department of Energy & Climate Change

CHP FOCUS

CHP Outreach Workshops

Programme: Reducing Energy Costs with Combined Heat & Power

Birmingham 16th June 2015

Department of Energy & Climate Change

CHP FOCUS

Opportunities for heat linking

Mike Doble

CHPQA

Department of Energy & Climate Change

CHP FOCUS

CHP for Buildings (likely)

- Hospitals
- Universities
- Hotels - large
- Leisure facilities with swimming pools
- Multi-residential blocks.

Department of Energy & Climate Change

CHP FOCUS

CHP for Buildings (less likely)

- Cottage hospitals, doctor's surgeries
- Schools
- Hotels - small
- Leisure facilities without swimming pools
- Low-rise housing
- Offices
- Retail.

Department of Energy & Climate Change

CHP FOCUS

Heat Networks

- Maybe just one building (hotel, residential block) – **Communal Heating**
- Or maybe many buildings (e.g. hospital, university)
- More than one building: connecting pipes – **District Heating**
- Heat linking of buildings within a site is not uncommon
- Heat linking beyond the site boundary is less common but may offer significant benefits

Department of Energy & Climate Change

CHP FOCUS

University of East Anglia

Department of Energy & Climate Change

CHP FOCUS

Heat linking - benefits

- Economies of scale: higher overall demand
- Smoother aggregate load profile through diversity of loads – more economic operation
- Opportunities for using lower cost and lower carbon heat sources: CHP, energy from waste, biomass, waste heat
- Connection of individual buildings that could not justify CHP or other on their own
- Centralised plant – reduced maintenance costs
- No need for heating (or chilling) plant in buildings…

Department of Energy & Climate Change

CHP FOCUS

Heat linking - issues

- Significant investment required for heat network
- Long-term contracts – investor needs certainty, heat customer loses some flexibility
- Reliance on provider
  - availability of back-up
  - heat prices
- Network losses

Department of Energy & Climate Change

CHP FOCUS

Why don't more do it?

- Carrying on with the status quo
- Lack of awareness of heat linking and CHP
- Existing CHP (or other) plant already working well
- Desire to keep decision making at site level
- Fears about reliability – past experiences
- Lack of obvious adjacent sites with which to link
- Adjacent site operators may be reluctant or already have new plant
- Not core business: who will take the initiative, who will devote the resource?
- Who will take ownership and responsibility?

Department
of Energy &
Climate Change

CHP
FOCUS

Department of Energy & Climate Change

CHP FOCUS

Who has done it?

- Over 450 district heating schemes in the UK
- Tachbrook Triangle – new-build apartments and some office space linked to CHP at Pimlico District Heating Undertaking
- This afternoon's case studies and site visit.

Department of Energy & Climate Change

CHP FOCUS

Tachbrook triangle

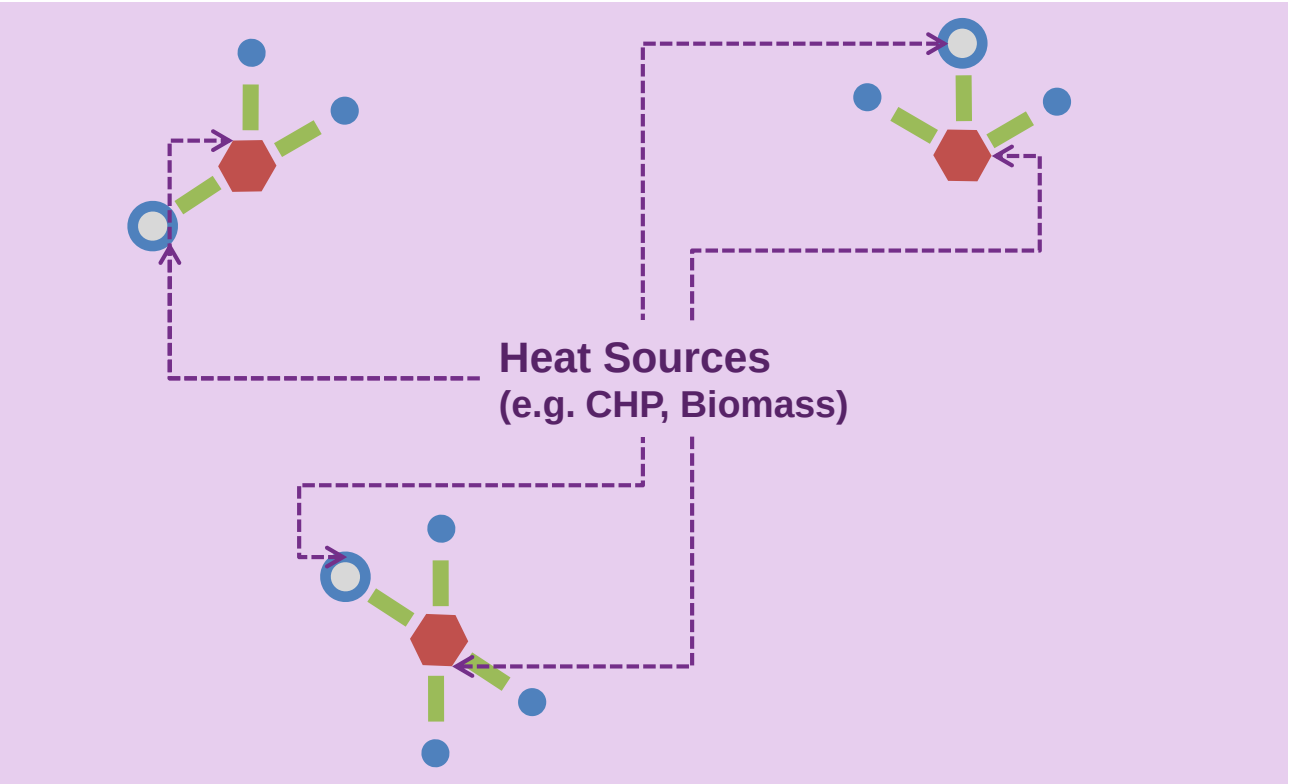
- Newly built private and affordable apartments with some commercial office space for the Westminster Primary Care Trust
- Connected to the Pimlico District Heating Undertaking (PDHU).

Department of Energy & Climate Change

CHP FOCUS

DH Network Development

Stage 1 – Initial Development



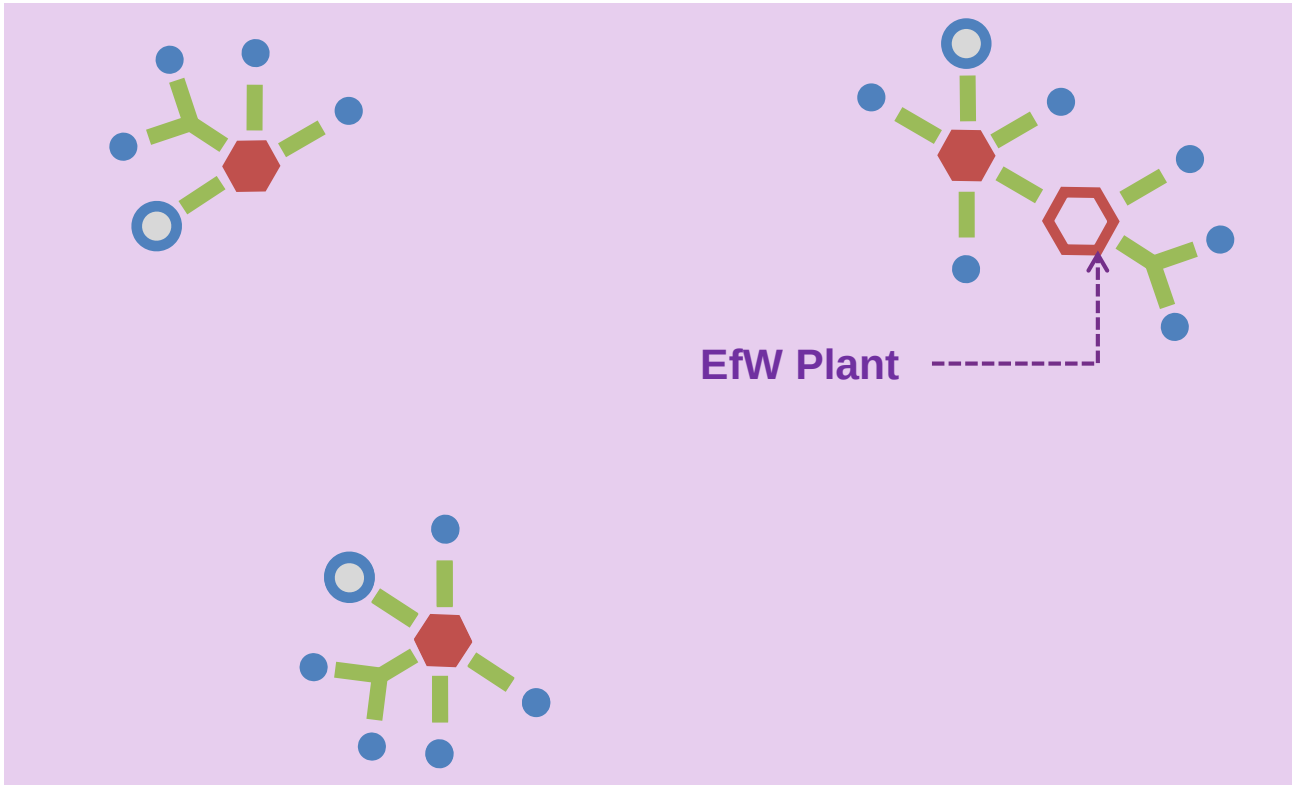
One or more independent cluster networks developed based around key “anchor” loads (e.g. social housing, hospitals, universities etc.) and other loads in the vicinity. Each cluster served by a single, small heat source (e.g. gas CHP, EfW plant, etc)

Department of Energy & Climate Change

CHP FOCUS

DH Network Development

Stage 2 – Expansion



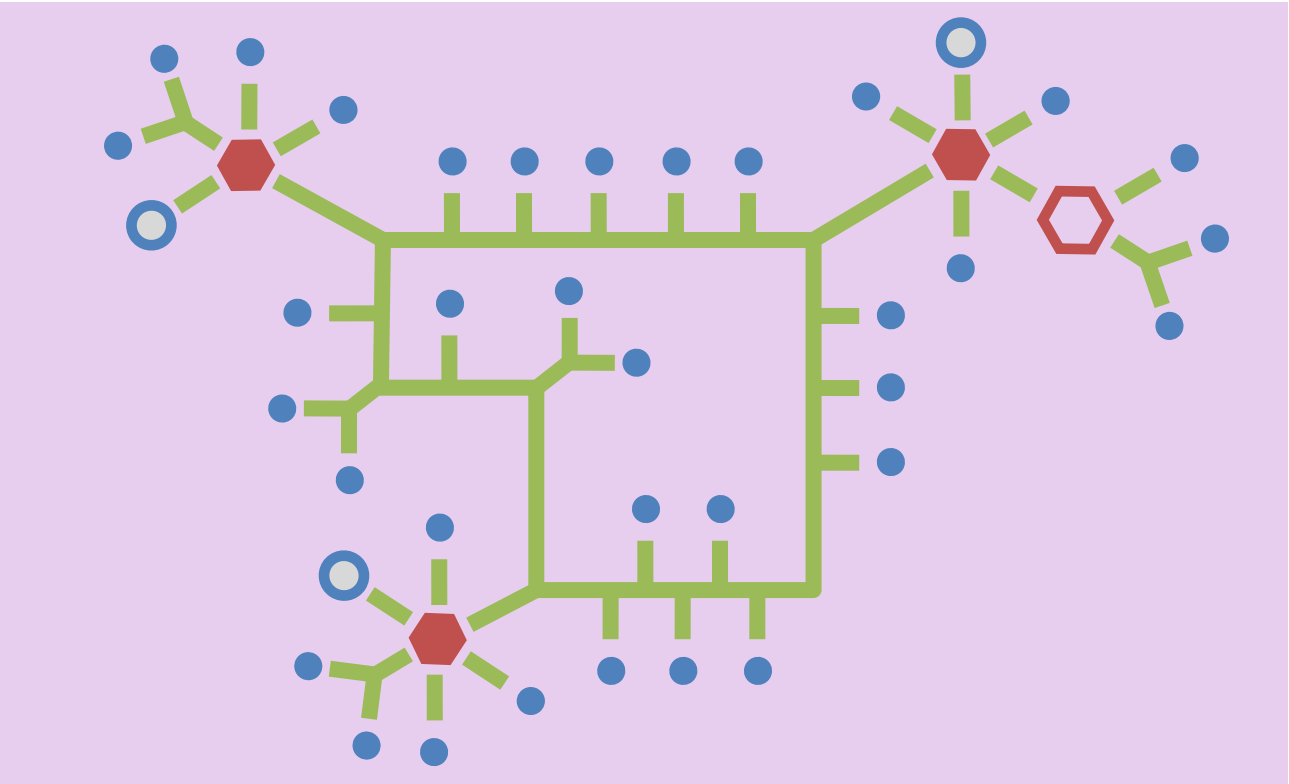
Clusters expand as they become more established to connect additional loads that have become economically viable. Individual heat sources grow in capacity to meet demand or are reinforced with larger heat sources (e.g. EfW CHP)

Department of Energy & Climate Change

CHP FOCUS

DH Network Development

Stage 3 – Interlinking



Interconnecting heat links installed to share excess heat capacity between clusters. Interconnector routes selected to enable further connection with economic demands situated between clusters

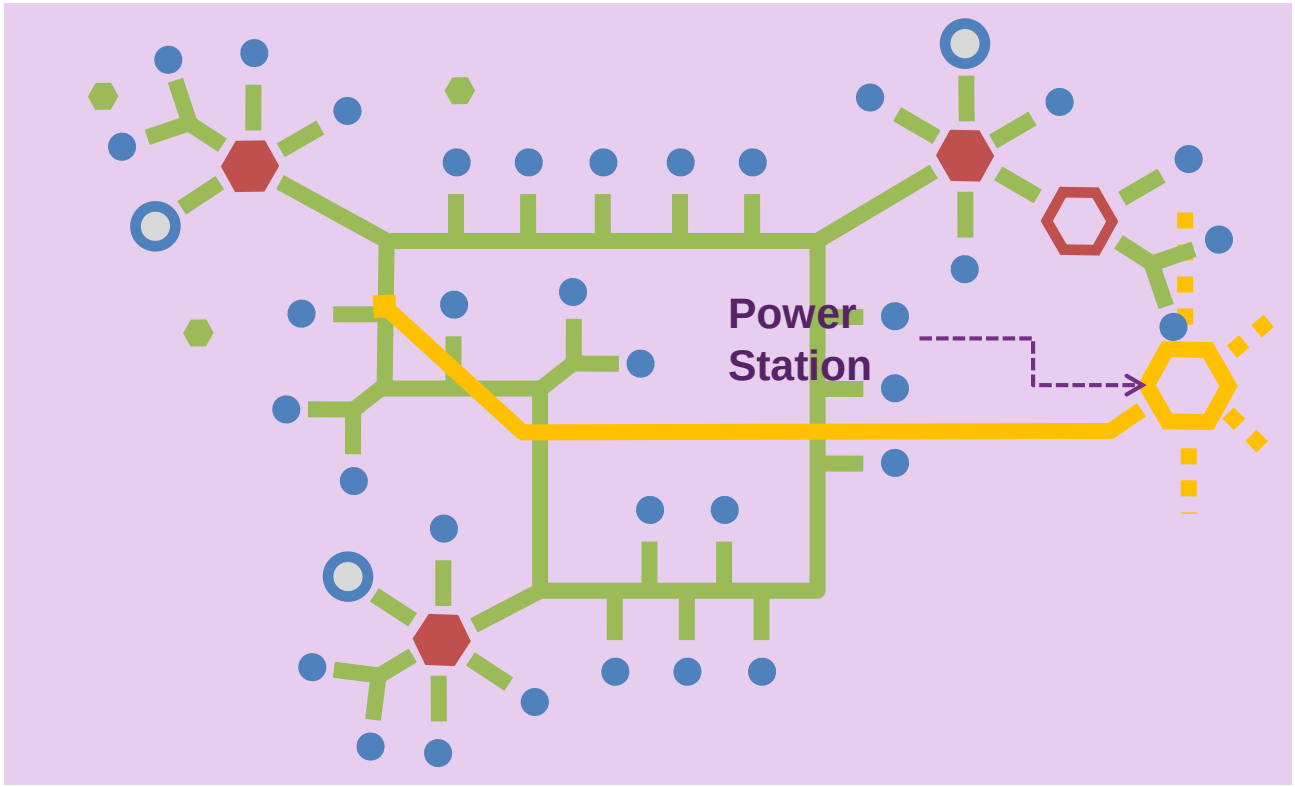
These can be developed by a 3rd party

Department of Energy & Climate Change

CHP FOCUS

DH Network Development

Stage 4 – Regeneration



Original heat sources will have reached the end of their lives. These will be replaced with new heat sources, which may include surplus heat from power stations, carried via high capacity transmission mains.

Department of Energy & Climate Change

CHP FOCUS

Any questions?

Department of Energy & Climate Change

CHP FOCUS

CHP Outreach Workshops

Programme: Reducing Energy Costs with Combined Heat & Power

Birmingham 16th June 2015