Brixton Energy Masterplan

Tuesday 8th December
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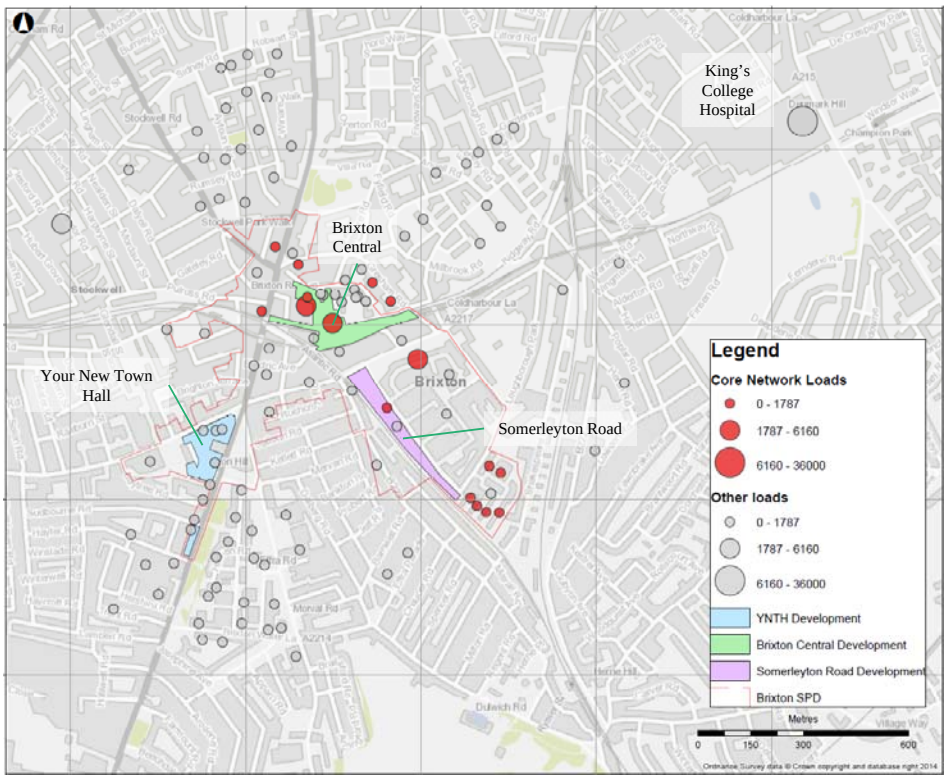
ARUP

Existing and future heat loads

- Demand data based on mix of meters, Display Energy Certificates (DECs) and benchmarks based on type/size
- New developments act as anchor loads and provide capital funding through developer connection charge
- Existing development more challenging to retrofit but can deliver significant carbon savings



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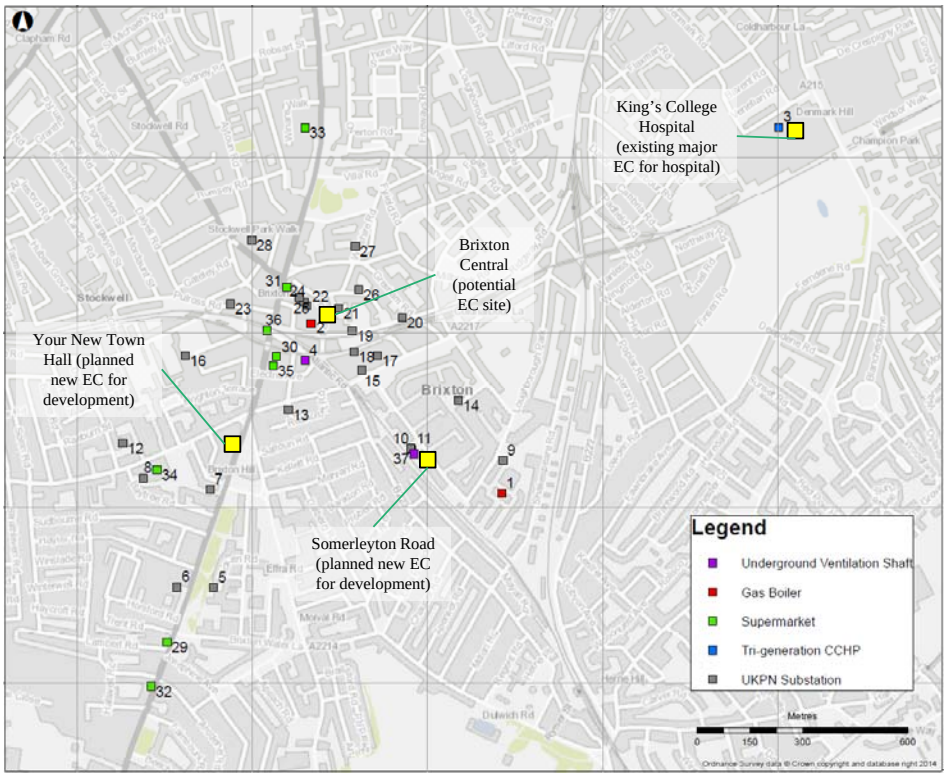
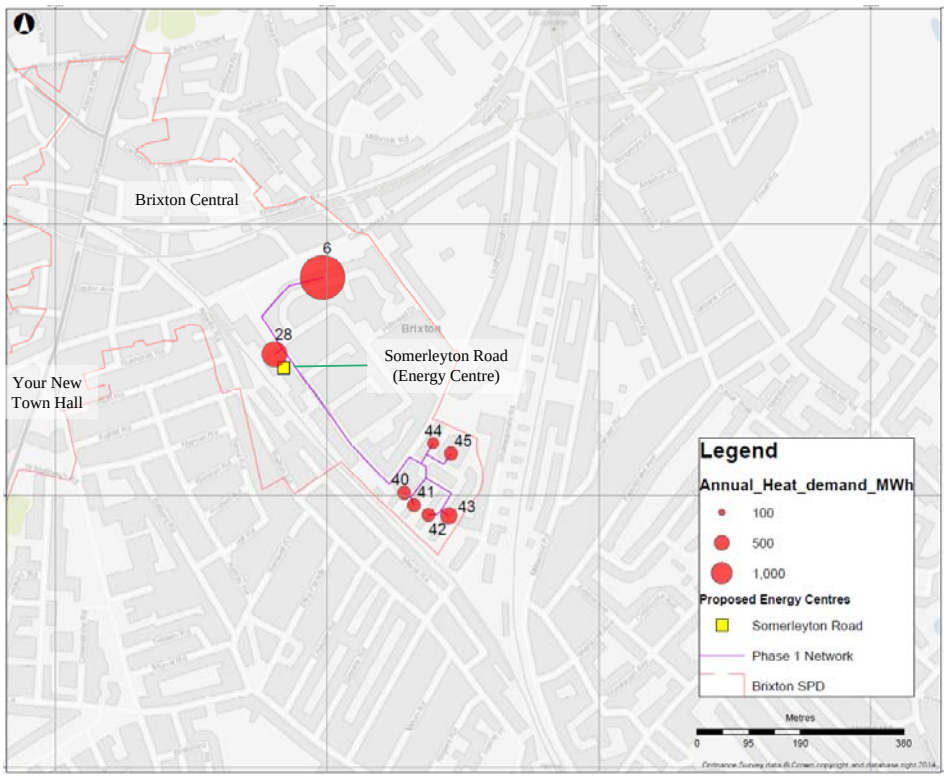
Energy centres and heat supplies

- Existing energy sources are typically dispersed and low temperature. Potential future sources but high risk for kick-start network
- Proposed Energy Centre (EC) at Somerleyton Road
- Alternative EC at Brixton Central
- Planned CHP at YNTH could be connected in future
- Longer term potential to take heat from King's College Hospital
- Air Quality considerations:
  - New ECs partially offset by displacement of existing systems
  - Central plant will have effective emission control and high stack to keep below statutory limits



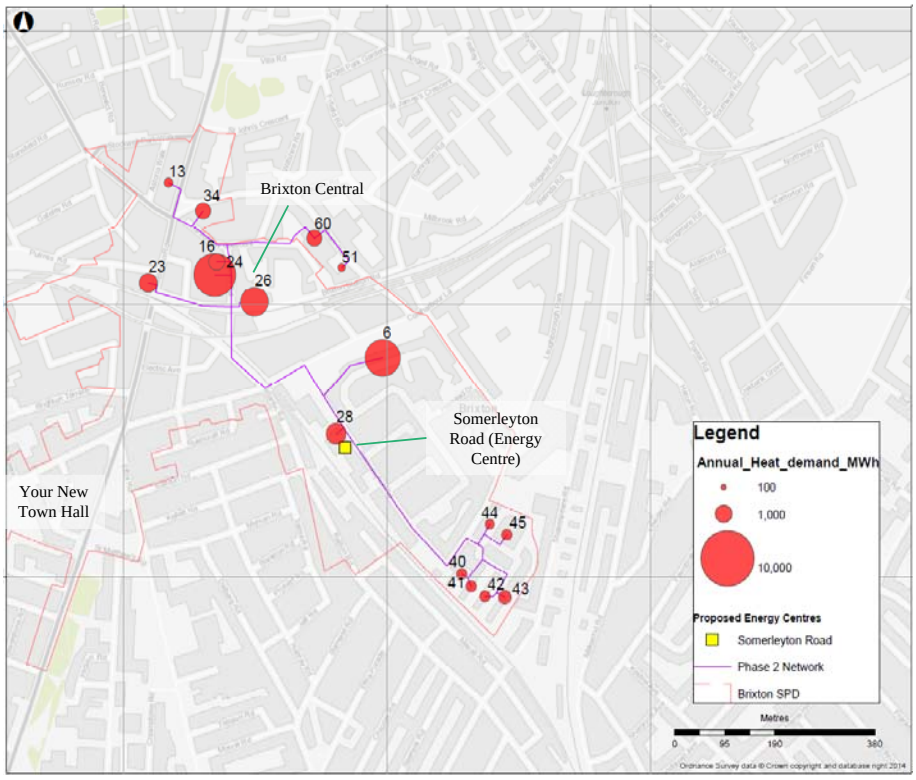
Core Network Phase 1, 2018-2019

- Mainly residential connections
- 1,000 dwellings connected:
  - Somerleyton Road
  - Southwyck House Estate
  - Elvedon House
  - Moyne House
  - Holmbury House
  - Farmleigh House
  - Kentwood House
  - Pyford House
- 1000m pipe route
- Energy Centre at Somerleyton Road
  - 4.8 MWth peak load
  - Boilers sized to meet peak load
  - 0.75MWe CHP provides baseload when running (typically 6,000 hours)



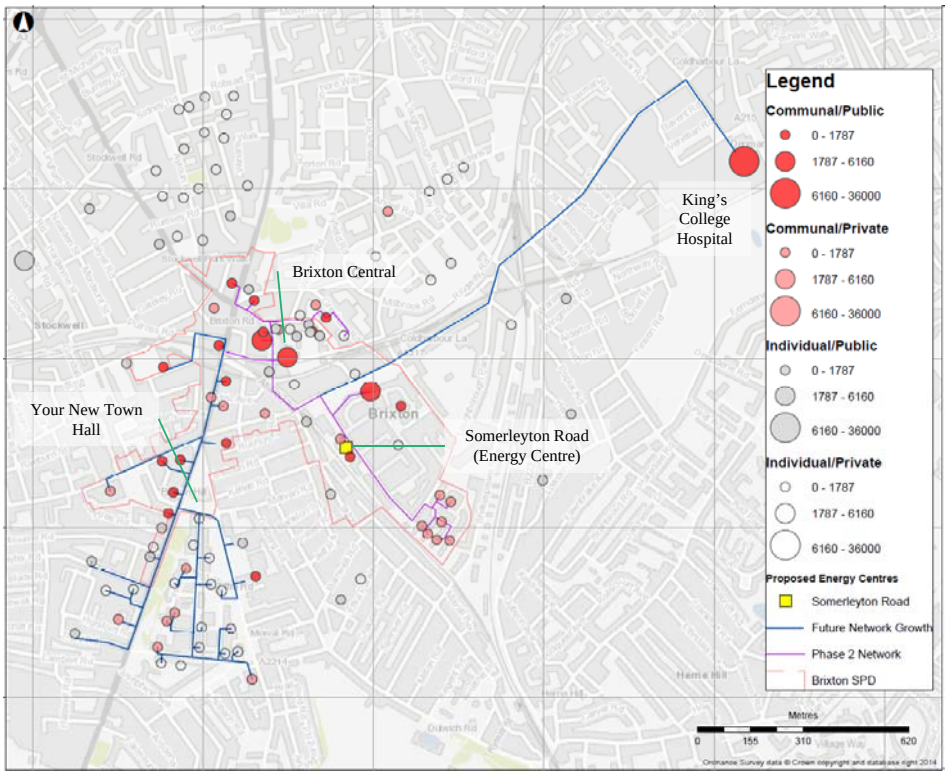
Core Network Phase 2, 2021-2024

- Mixed use connections with 500 more dwellings (1,500 total):
  - CYPS Offices
  - Brixton Rec
  - 442-444 Brixton Rd
  - International House
  - Brixton Central
  - Police Station
  - Fire Station
  - Witchwood House, Canterbury Gardens Estate
- Additional 1,100m pipe route (2,100m total)
- Total capacity:
  - 9.7 MWth total peak load
  - Boilers sized to meet peak load
  - 2.25 MWe CHP total installed capacity
- Carbon savings of 1,600 tonnes per annum vs. BAU (based on SAP 2012 grid emissions factor)



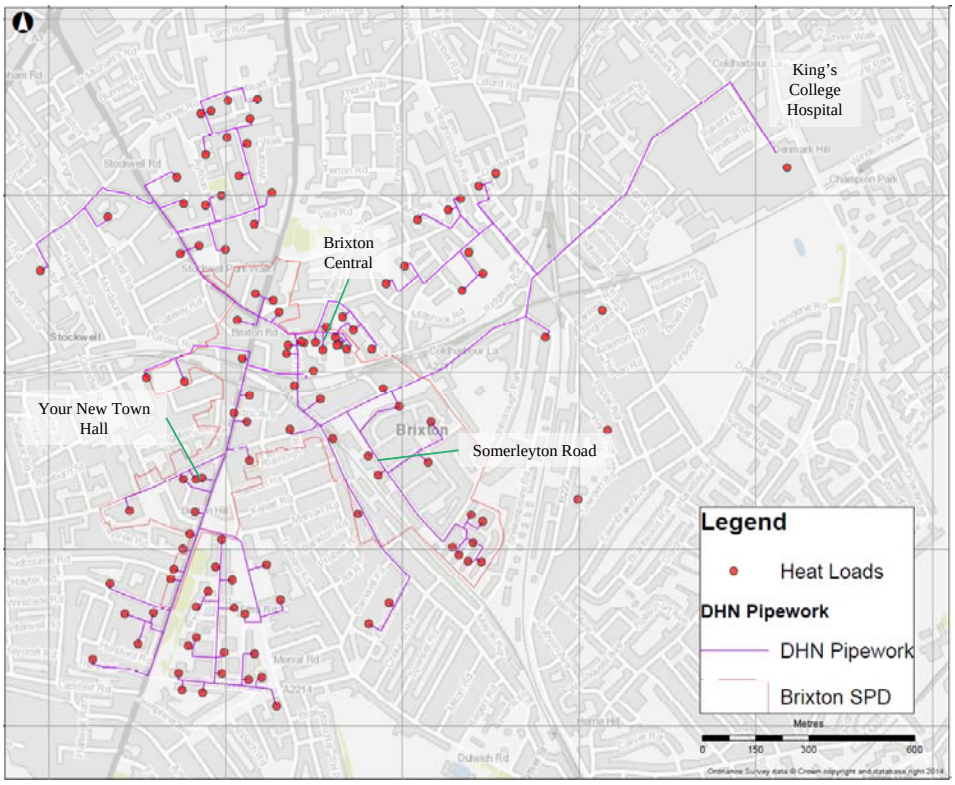
Future Network Expansion

- Potential connection to King's College Hospital and Brixton Hill area.
- Heat loads north of Brixton are individually heated and privately owned, therefore unlikely/unviable to connect.
- Hospital shown as a heat load, but could be a heat source



Strategic Masterplan

- Long-term potential network
- Technically plausible but uncertainties about deliverability when considering the connection to all heat loads



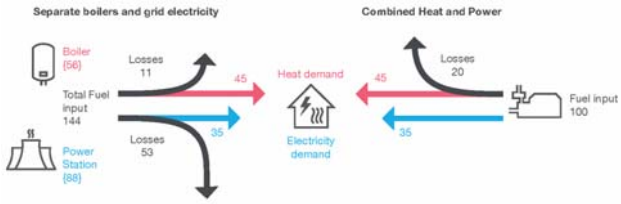
Economic Overview / Delivery Model

- 30-year analysis period
- Core network IRR appears attractive based on a public sector delivery model
- Commercial finance & delivery typically requires a 12% return for ESCo
- Council owns or controls most of the potential Core network sites
- Possible delivery routes:
  - Council ESCo with DBOM contractor (e.g. Camden Somers Town)
  - Council procures commercial ESCo under 40-year concession (possibly with gap funding) (e.g. Olympic Park)
  - Somerleyton Road developer procures ESCo to deliver site network, incentivised to expand.

Financial Indicator	Core Network Phase 1 only	Full Core Network (including phase 2)	Expanded Future Network	Strategic Masterplan
Up front capex (£000s)	4,000	7,900	17,600	69,600
Total Lifecycle costs, over 30 years (£000s)	23,400	54,000	125,600	255,300
Total Revenues, over 30 years (£000s)	24,740	62,000	119,000	242,000
IRR, 30 years	6.2%	8.6%	4.0%	-2.1%
NPV, 30 years @ 6% discount rate (£000s)	54	1,250	-1,909	-24,100

Network benefits

- **Carbon savings**: CHP + DH can deliver net savings vs. BAU
- **Air quality**: net benefit depends on solution but well-designed systems will be no worse than BAU.
- **Energy Efficiency improvements**: Network investment can help address new metering requirements on existing systems, and improve system performance.
- **Planning compliance**: Enables connected new developments to comply with London Plan
- **Cost savings for developments**: Developer connection charge should be less than avoided costs of delivering heat and carbon savings without a heat network
- **Cost savings and certainty for customers**: Pricing policy should provide stable, competitive prices for customers
- **Peace of mind for customers**: System is fully maintained and operated by the ESCo, no need to worry about your boiler breaking over Christmas
- **Future proofing**: Supply agnostic system, can be connected to other lower carbon heat sources (easier than retrofitting 1,500 separate homes).
- **Long-term infrastructure**: pipes last 50+ years, delivering continued operational savings



Network Risks

- **Demand risk**: Will planned buildings connect? Will phasing change? Is demand overestimated? Will climate change reduce demand?
- **Credit risk**: Customer late payments and non-payments affect business cash flow.
- **System efficiency**: Design thermal losses are <20%, experienced losses can be >60%. But can be controlled with good design, installation, data and the right incentives on the Operator.
- **Carbon intensity**: Changes in grid intensity will affect savings from different supply options
- **Customer trust and protection**: Lots of examples of bad practice. Transparent, fair, regulated pricing needs to be in place from the start.

Next Steps

- **Somerleyton Road**: Continued engagement to secure commitment for the network energy centre and to connect the site to the network. Agree contingency position and longstop dates.
- **Your New Town Hall**: ensure the on-site network is designed to allow future connection to the wider network
- **Other developments**: Require a commitment to connect through planning
- Develop a commercial strategy, identify the Council's capacity and willingness to play a role in network delivery
- Commission a feasibility study and business case, refine the Core Network scheme in detail
- Typical period from start of procurement to "heat on:" 18-24 months, therefore procurement needs to start in 2016