

Cutting the Capital's carbon footprint:

delivering decentralised energy





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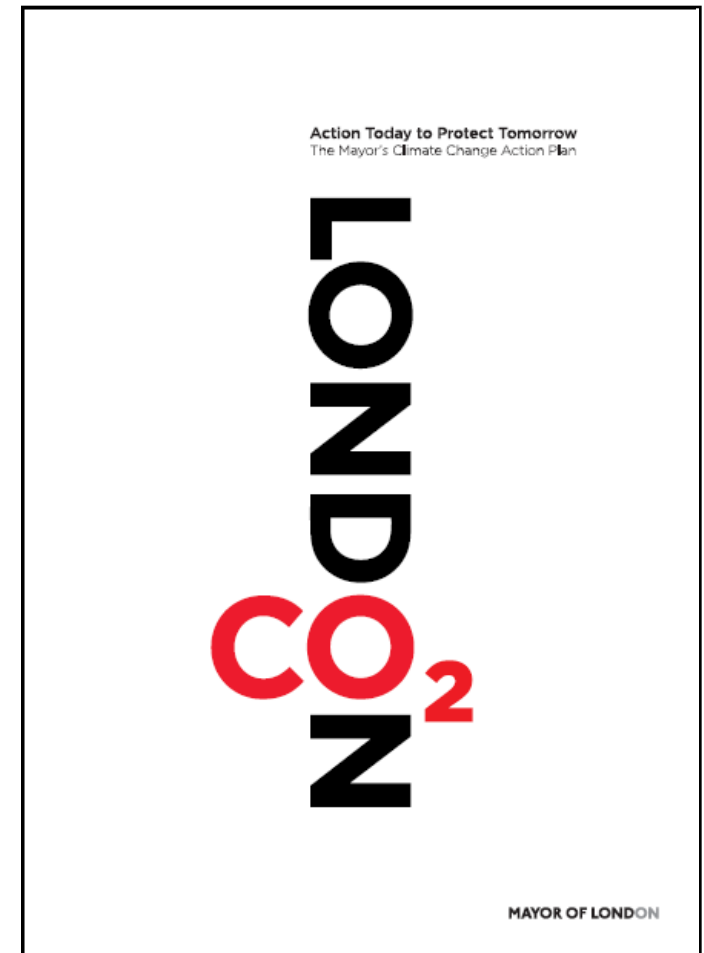
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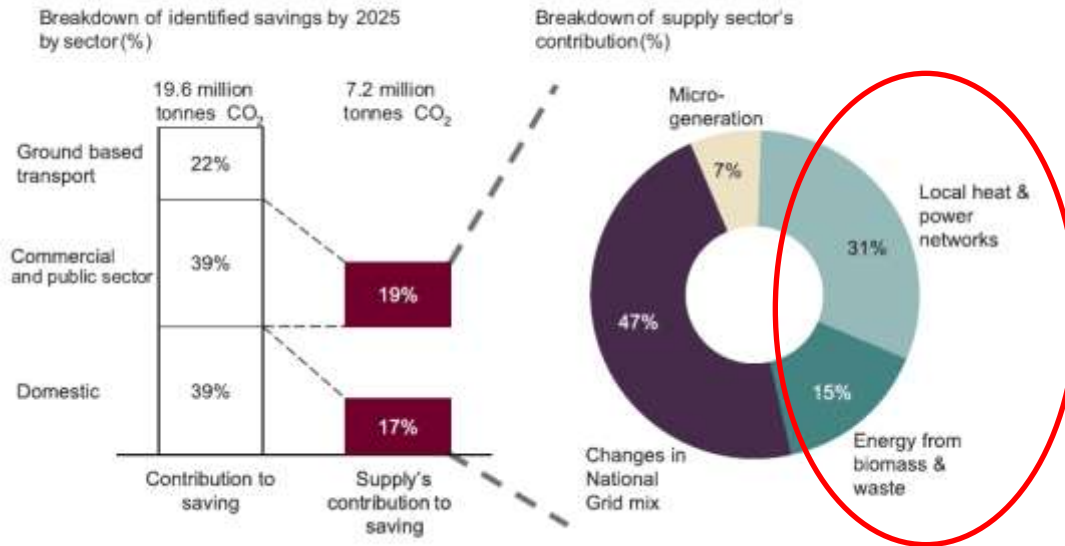
Project background – Mayor of London policy

- 60% reduction in carbon dioxide emissions by 2025



The decentralised energy target

Supply sector's contribution to CO₂ savings by 2025



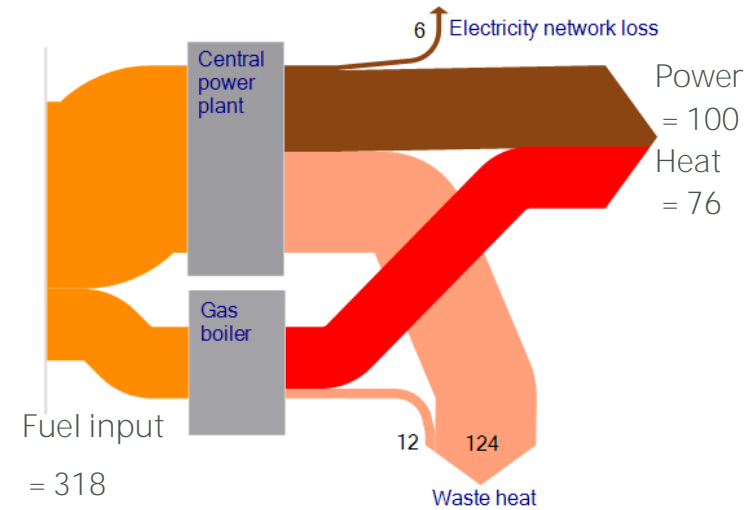
London's energy consumption
= 120,000 GWh/yr

- **25% of London's energy from decentralised sources by 2025**
- 50% by 2050

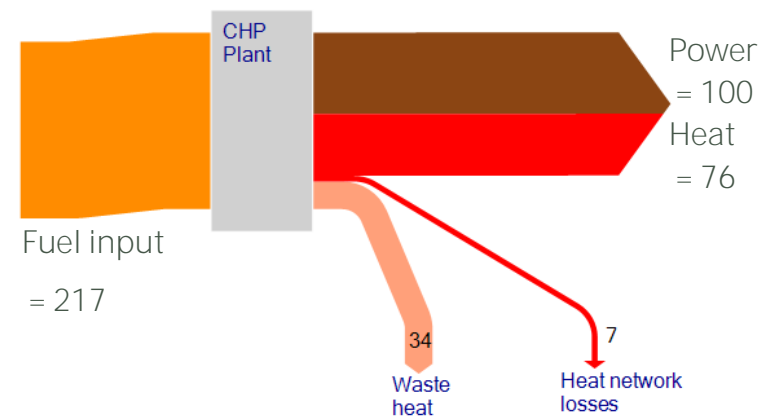
Decentralised energy

- Emphasis on combined heat and power linked to modern efficient district heating networks
- Report focuses on the largest potential carbon emission savings
 - Gas fired CHP
 - But also energy from waste and biomass

Current centralised

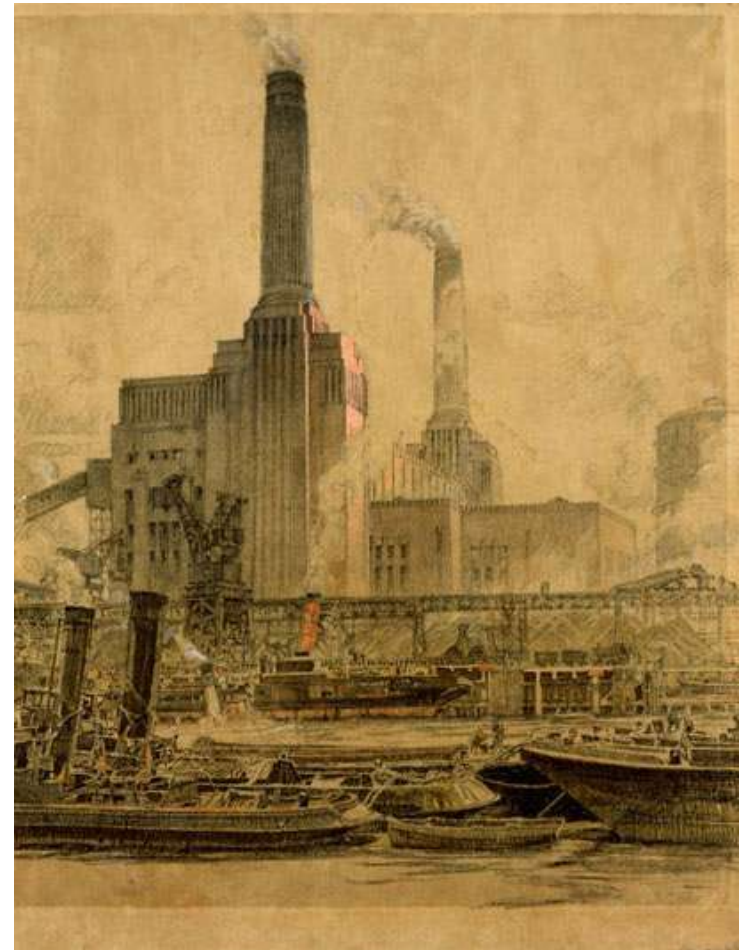


Future decentralised



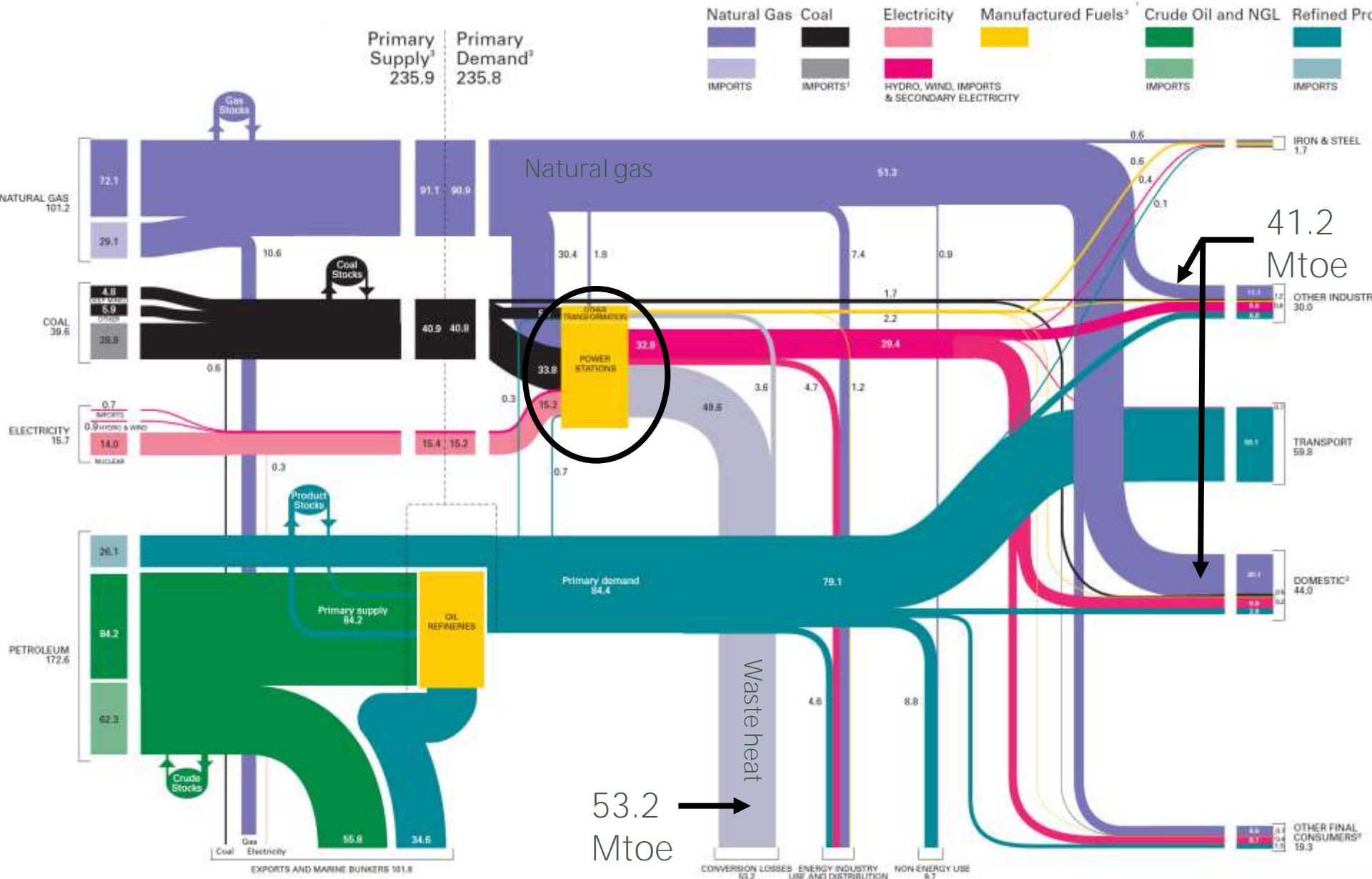
BUT - District heating in the UK, brief history

- Unregulated
- Previously associated with social housing
- Often unreliable, using outdated technology, with limited or no user controls
- Cheap natural gas - alternative
- Work in the 1970s and 1980s recommended:
 - Establish National Heat Board
 - **Build 'Lead City' scheme(s)**
 - 9 main schemes including Barking Power Station
- 2009 - NEW POLICY SUPPORT FROM NATIONAL GOVERNMENT (Department for Energy and Climate Change)



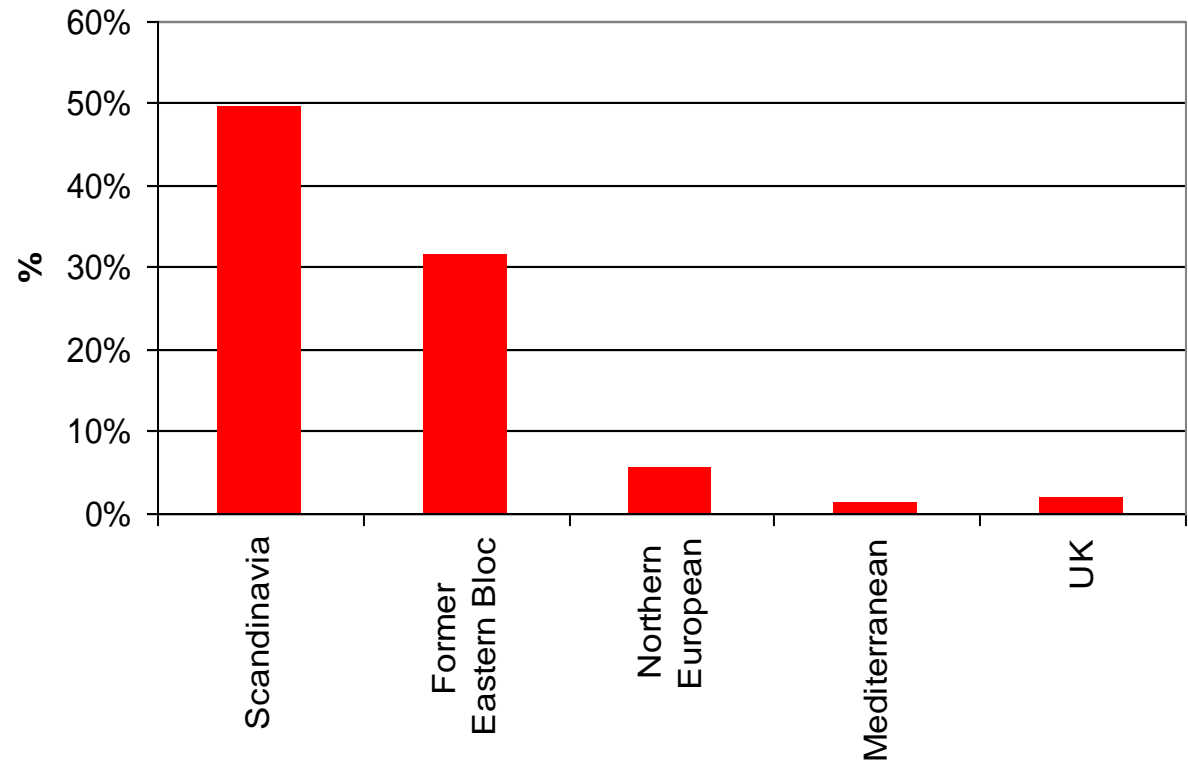


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Current position – UK district heating heat market penetration 2005

- Target for London
 - 30,000 GWh / year
- Decentralised energy supply, London 2006
 - 3,478 GWh / year
- New district heating systems were only being built where town planning policy can mandate it – individually in new buildings





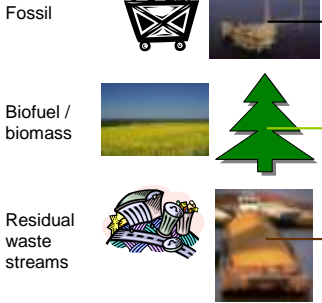
Cutting the Capital's Carbon Footprint – project scope

- Positive contribution to the low carbon energy debate in London from private sector businesses
 - Financiers
 - Energy companies
 - Property developers
 - Lawyers, accountants
 - Engineers etc
- Promotion of commercially viable, deliverable solutions taking advantage of the expertise in the business community
- Identify most viable scale of decentralised energy provision for London
- Analyse barriers to implementation of decentralised energy
- Make recommendations for action to remove these barriers

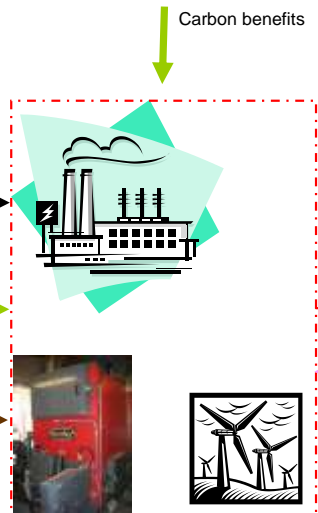
Methodology

- Identifying barriers and success factors
 - Case studies
 - Interviews
 - Workshops
- Economic modelling – scale comparisons
- Energy and carbon balance
- Over 90 organisations and 100 people involved over 8 months in 2008

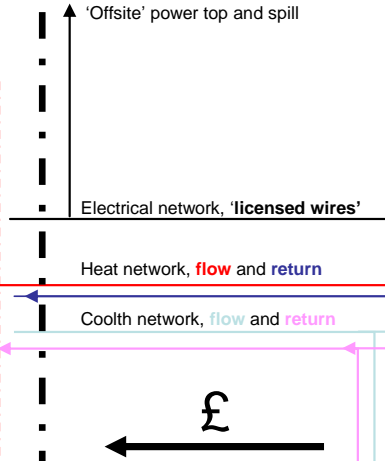
Fuel supply



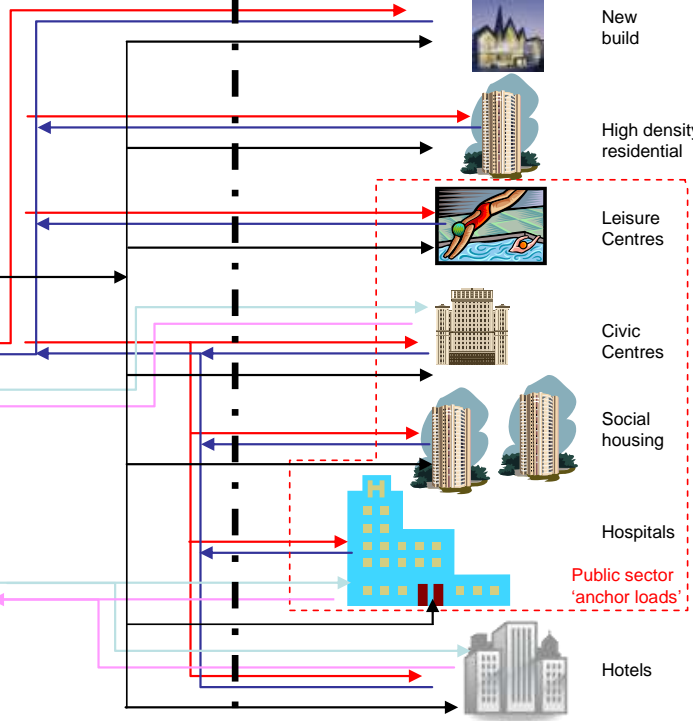
Energy island



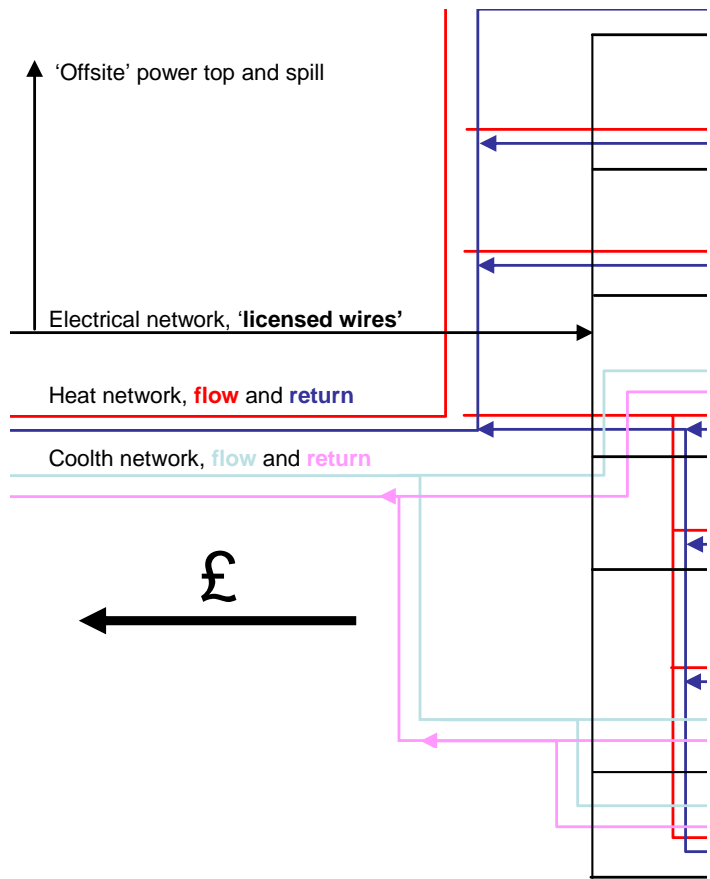
Energy networks



Consumer connections

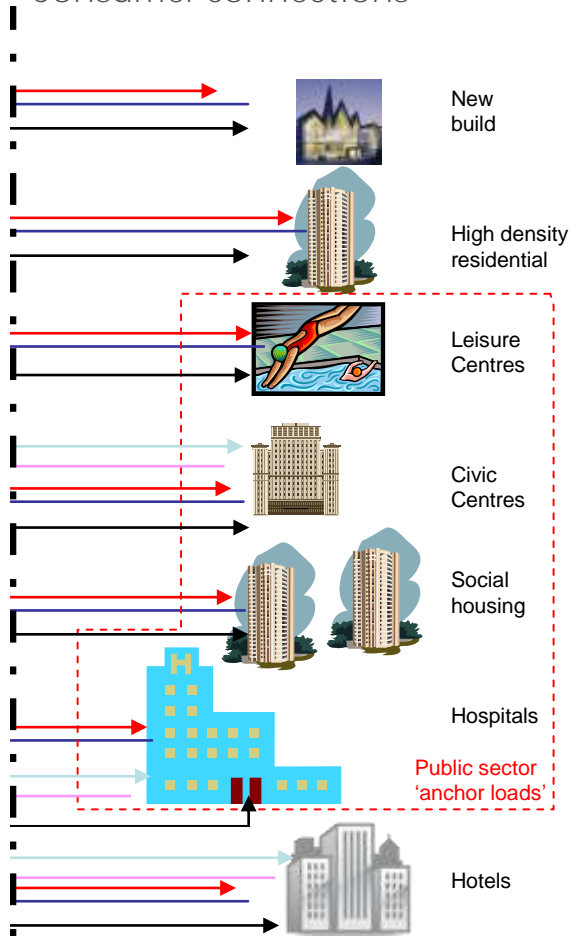


Energy Networks



Barrier	Mitigation
Site by site approach will not meet targets and does not deliver maximum carbon savings or economic scale of CHP plant Phasing of developments needs to be exactly aligned	Role for strategic project developer – INTEGRATOR Contribution by developer towards network and future connection

Consumer connections



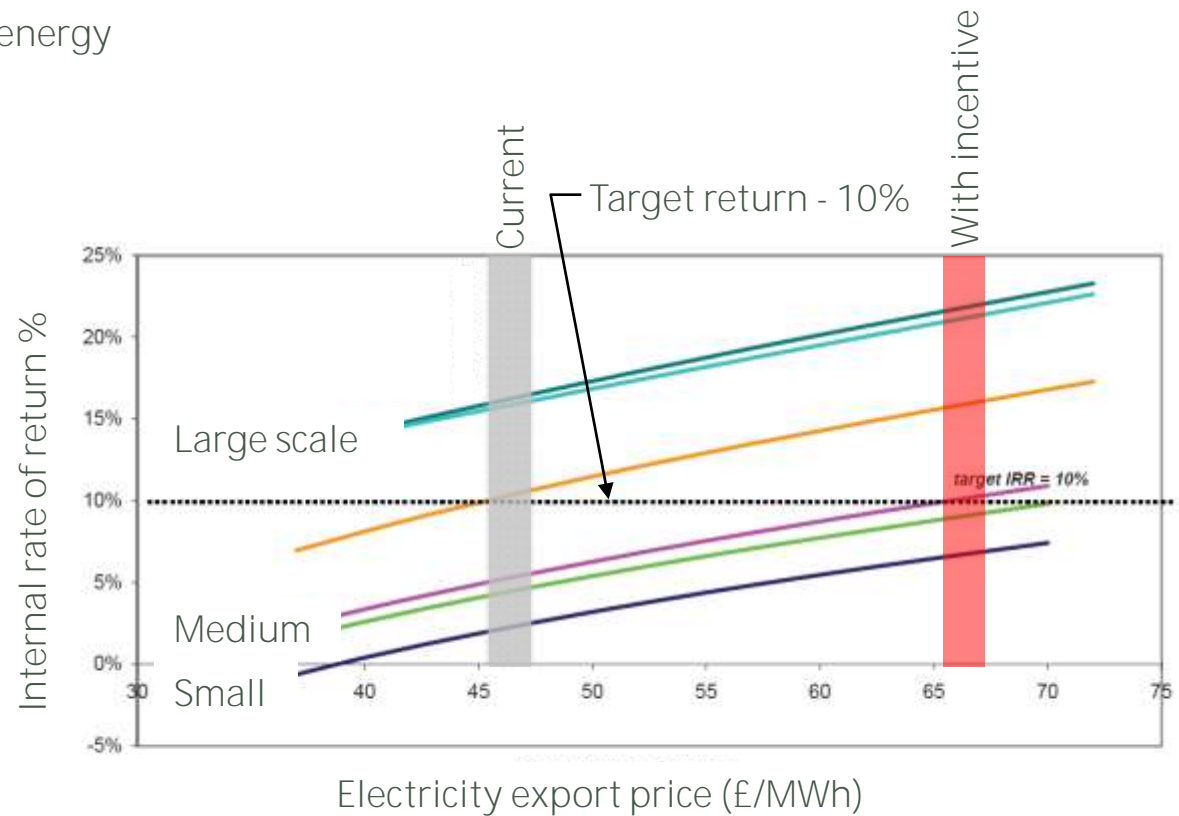
Barrier	Mitigation
High initial capital investment and high risk	Anchor heat loads from existing buildings
Long payback periods on investment	Regulation?

Barrier	Mitigation
Consumers not protected from monopoly supply	Light touch regulation for consumer protection
	Covenant from public sector
	Industry agreement on 'Customer Charter'

Summary Recommendation 1

Economic incentive for decentralised energy

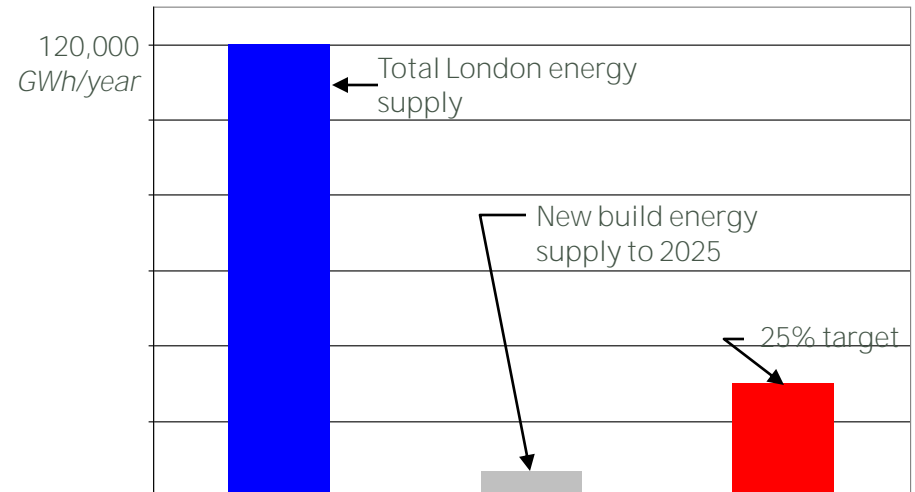
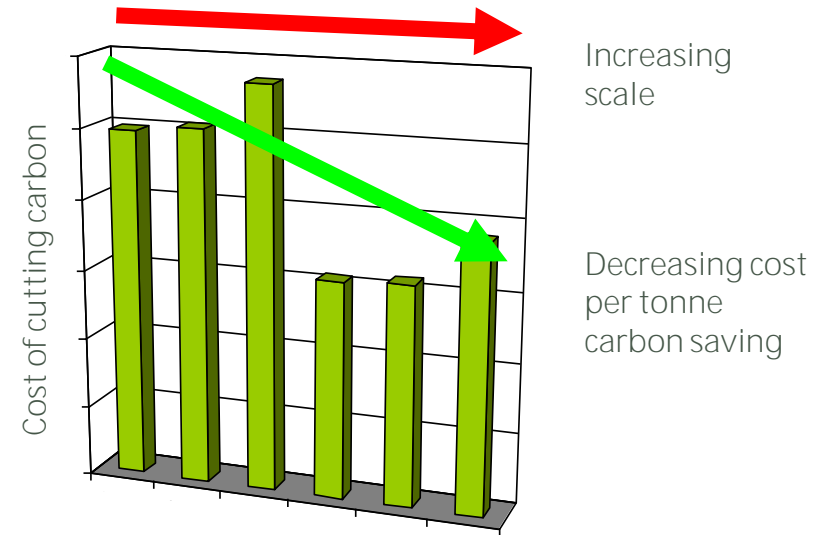
- Incentive for CHP
 - equivalent to £10-20/MWh
- OR
- Heat incentive
 - applied to all sources of low carbon heat, not just renewable energy



Summary Recommendation 2

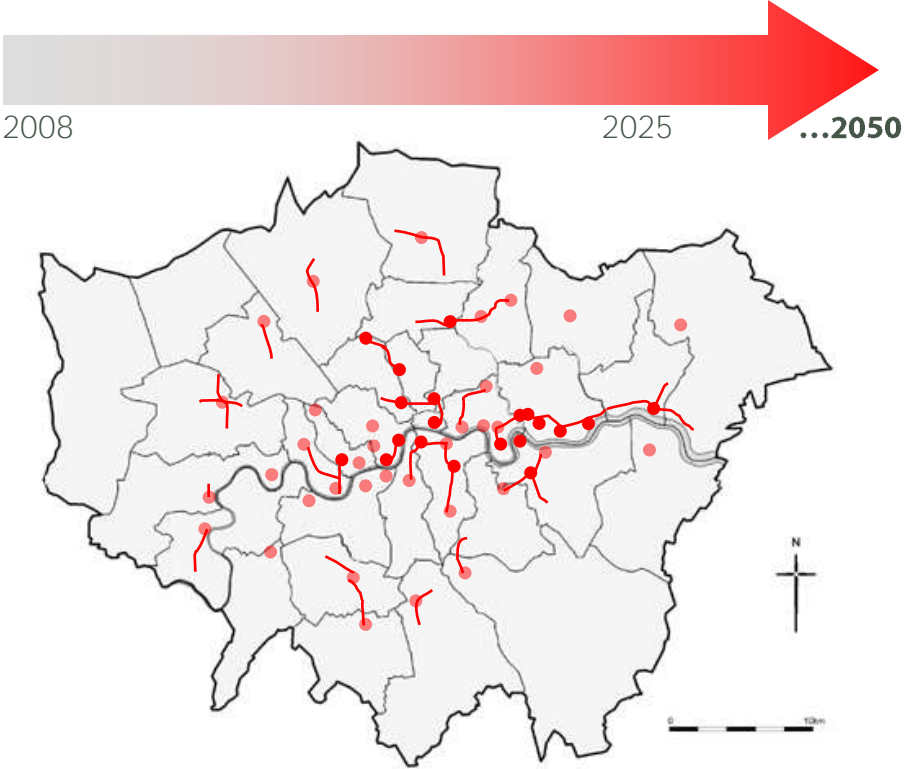
Efficient scale of system serving existing buildings

- Larger scale CHP plants deliver higher carbon savings for lower cost
- Must connect existing buildings to meet the target
 - Only one fifth of 25% target by 2025 from new build
 - 4/5 of target will be met by existing buildings



Summary Recommendation 3

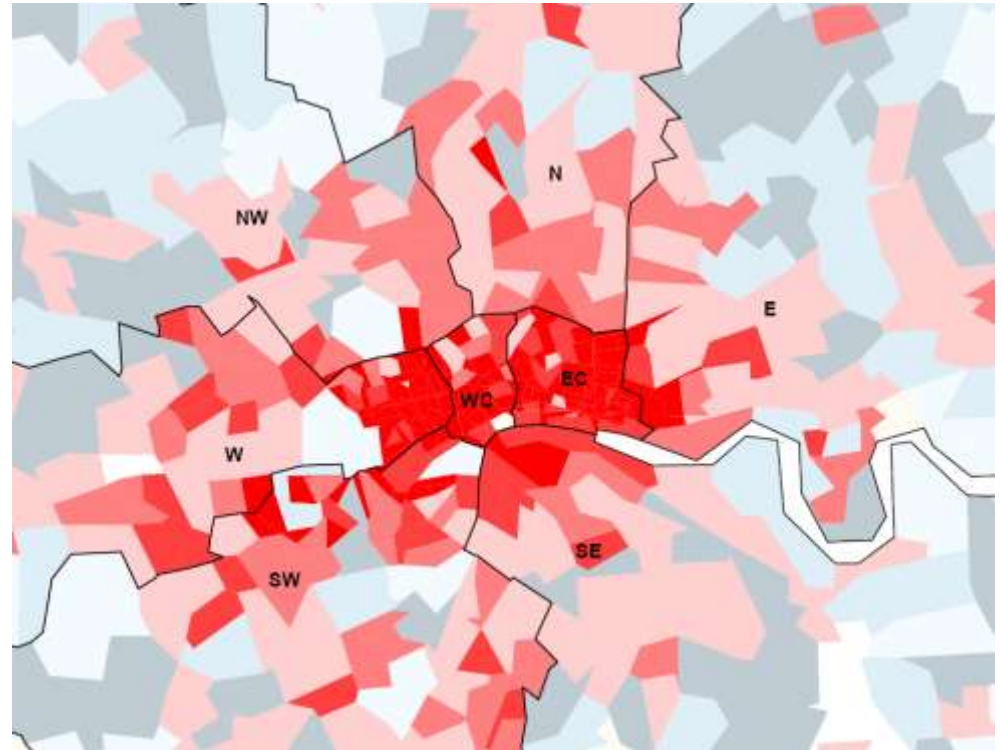
'Energy for London' and a strategic plan



Summary Recommendation 4

Energy masterplans for each borough (municipality)

- Heat mapping
- Identify areas for decentralised energy provision
- Create 'energy masterplan'
 - Identify land for energy centres
 - Require connection to decentralised energy network for new development
 - Provide incentive to connect through town planning system
 - **Public sector buildings as 'anchor tenant' heat loads**

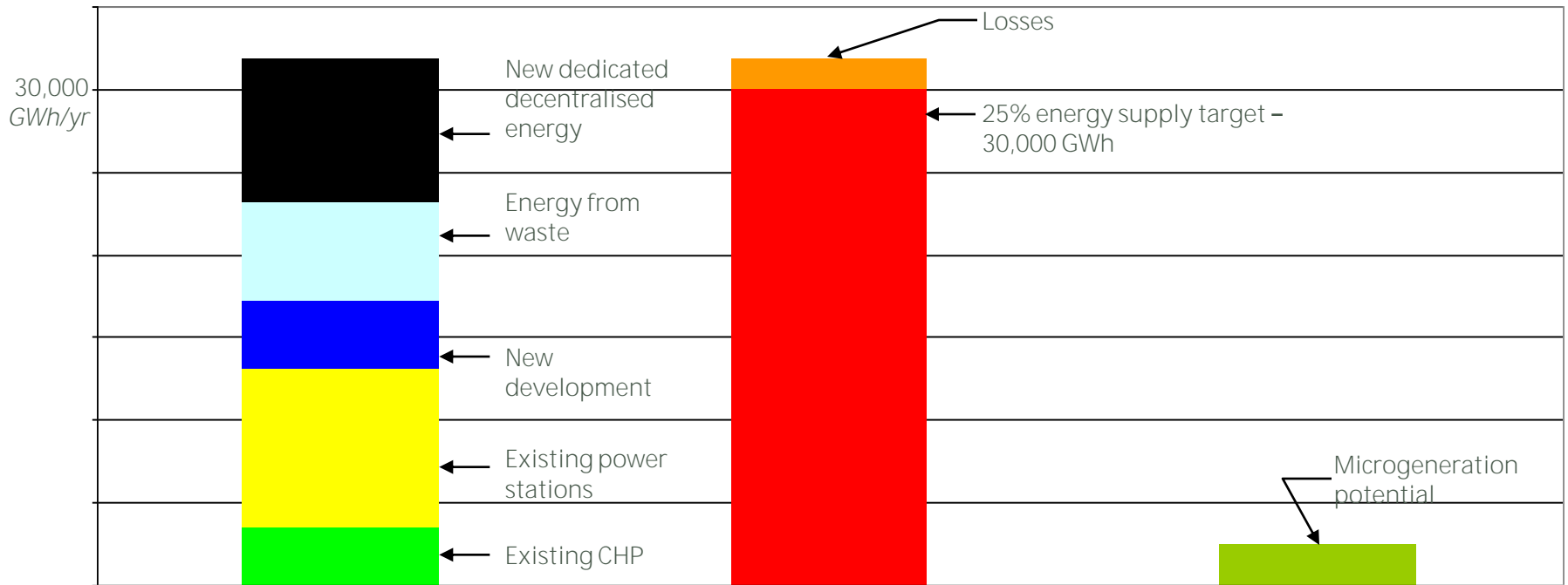


Summary Recommendation 5 Public Private Partnerships for project delivery

- Developed from energy masterplans
- Different approaches to suit individual projects
- 'Light touch' regulation to protect consumers
- Green Energy Fund

Public sector	Private sector
Long term approach in the public interest	Capital investment
'Anchor heat loads' – public sector buildings	Design and construction expertise
Land for energy centres	Operation
Planning support	Management
Network routes – statutory undertaker status	
Covenant	

Our proposed decentralised energy mix to meet 25% target



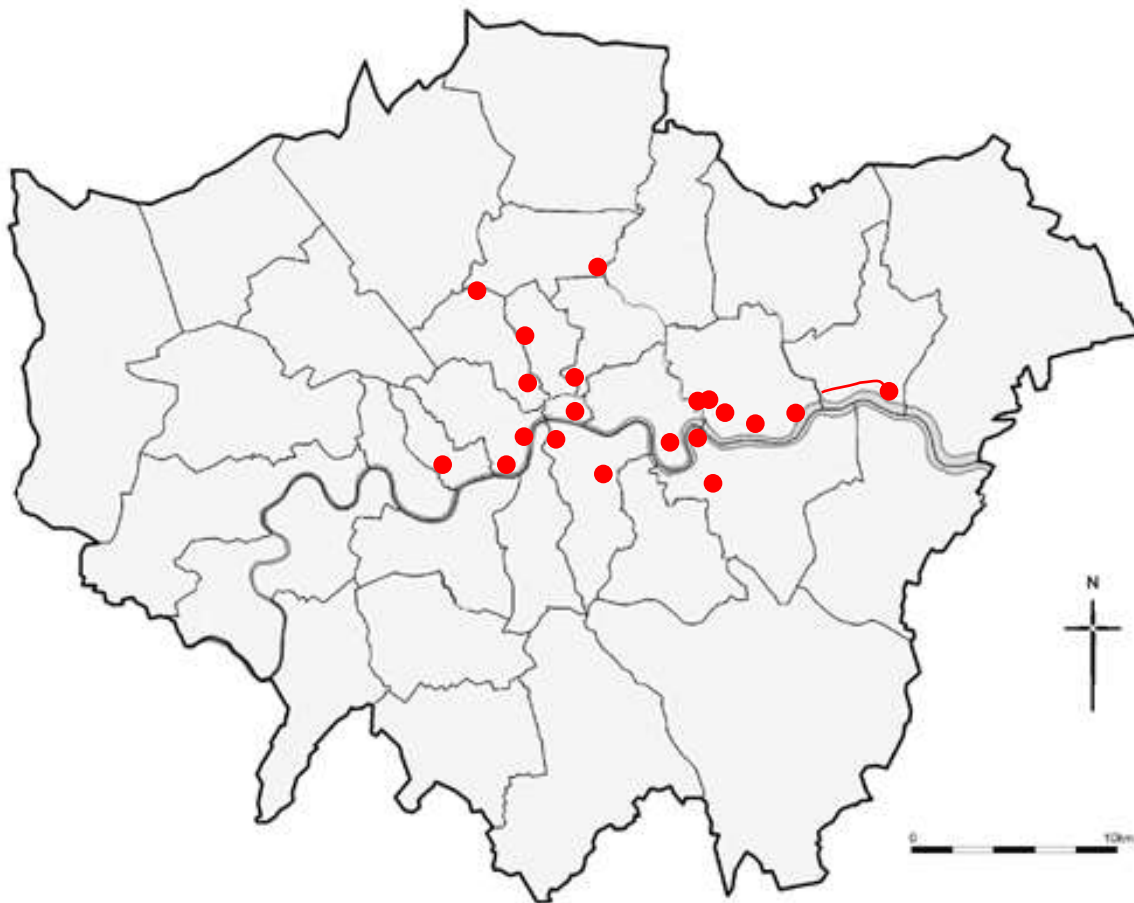
Vision for London



What is the long term vision for the provision of decentralised energy in London?

Current capacity:
<200 MW electricity
<500 MW heat

Vision for London



What is the long term vision for the provision of decentralised energy in London over:

5
years

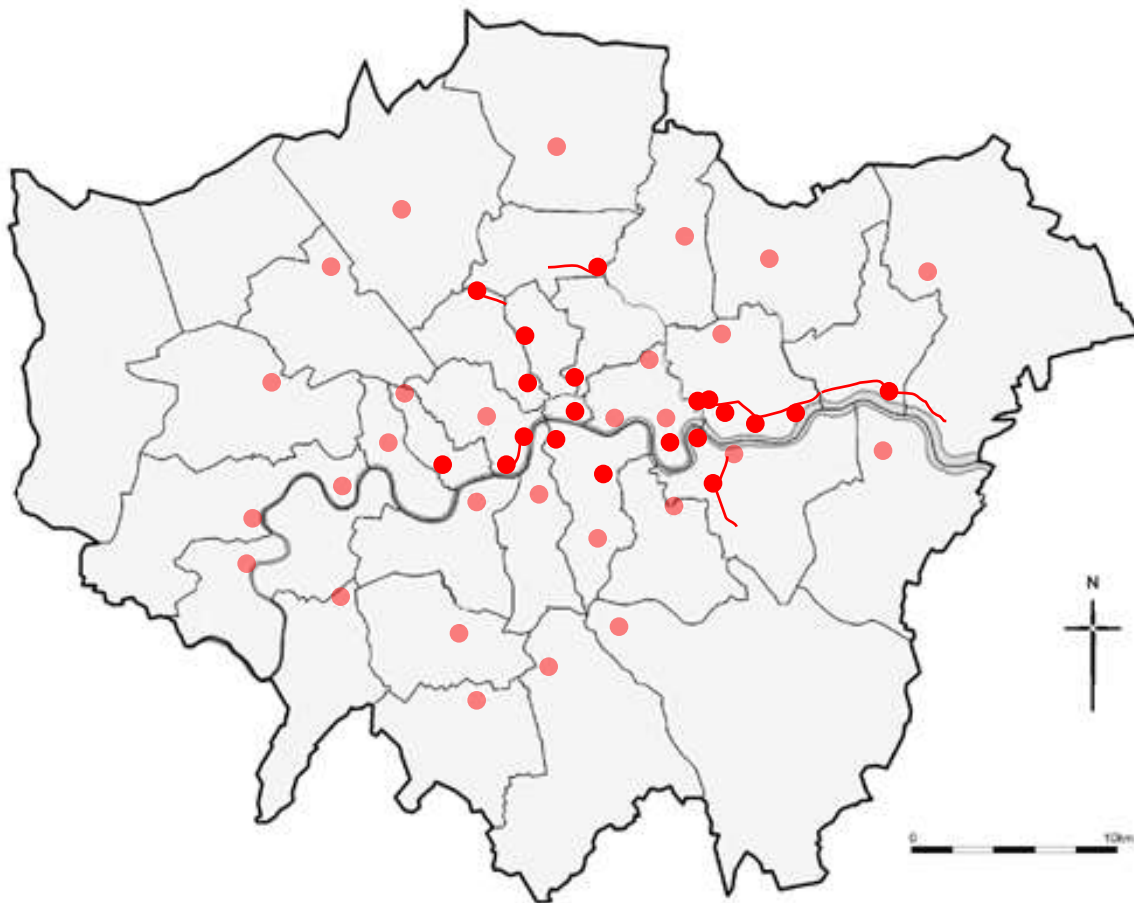
Vision for London



What is the long term vision for the provision of decentralised energy in London over:

- 5
- 10?
- years

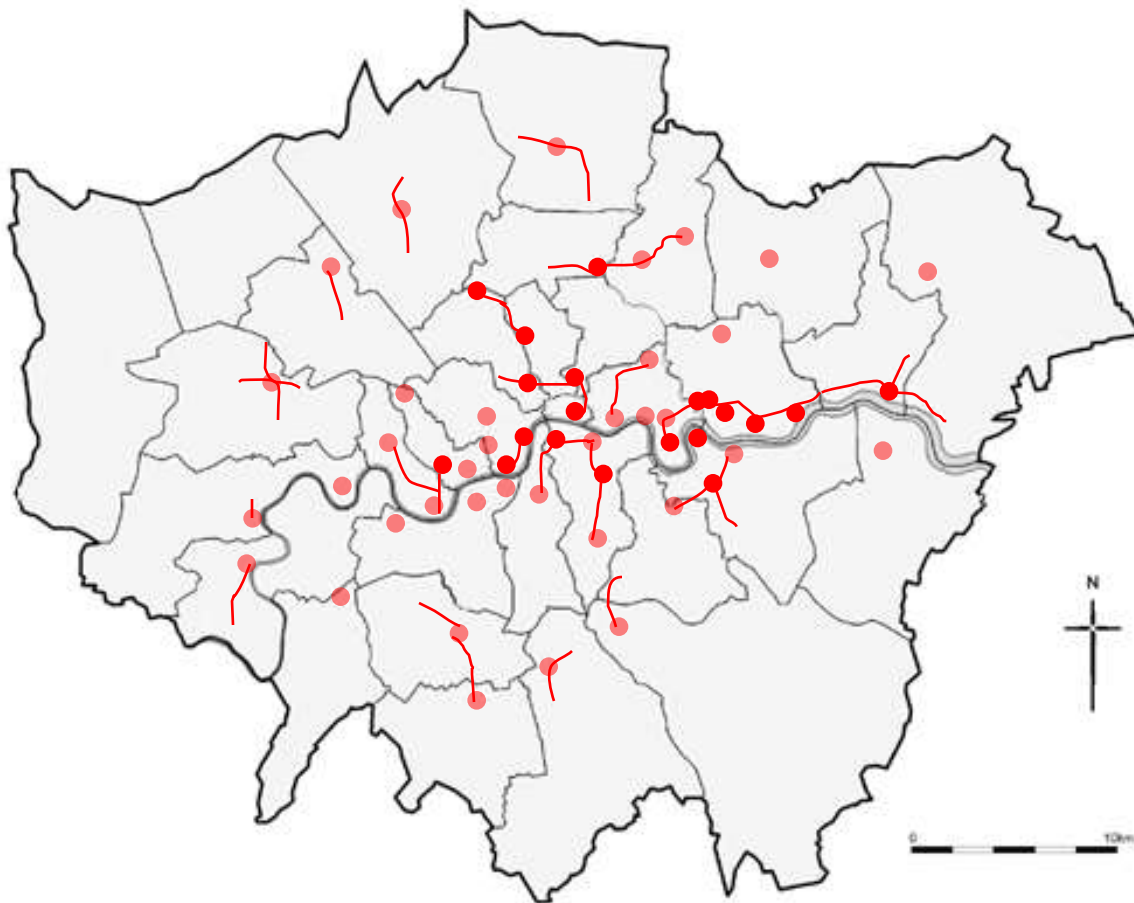
Vision for London



What is the long term vision for the provision of decentralised energy in London over:

- 5
- 10
- 15?
- years

Vision for London



What is the long term vision for the provision of decentralised energy in London over:

- 5
 - 10
 - 15
 - 30?
- years

CCAP Target = 25%

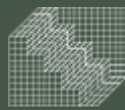
Future capacity:
~1,800 MW electricity
~3,400 MW heat

x10 FOLD INCREASE!

Progress since findings launched

- London Mayor recognises need to invest in decentralised energy at an efficient scale
 - Budget of £30m to kick start development over 4 years
 - European funding – JESSICA, EIB
 - Housing and Communities Agency Funding
- Several projects already underway
 - Large, strategic redevelopments
 - 2012 Olympic Park
 - Existing power stations
 - Existing waste incinerators
- Heat mapping studies to be published by Greater London Authority Q3 2009, building first stage of 'Strategic Heat Plan' for London
- Developing a Market Prospectus for potential financial and energy companies

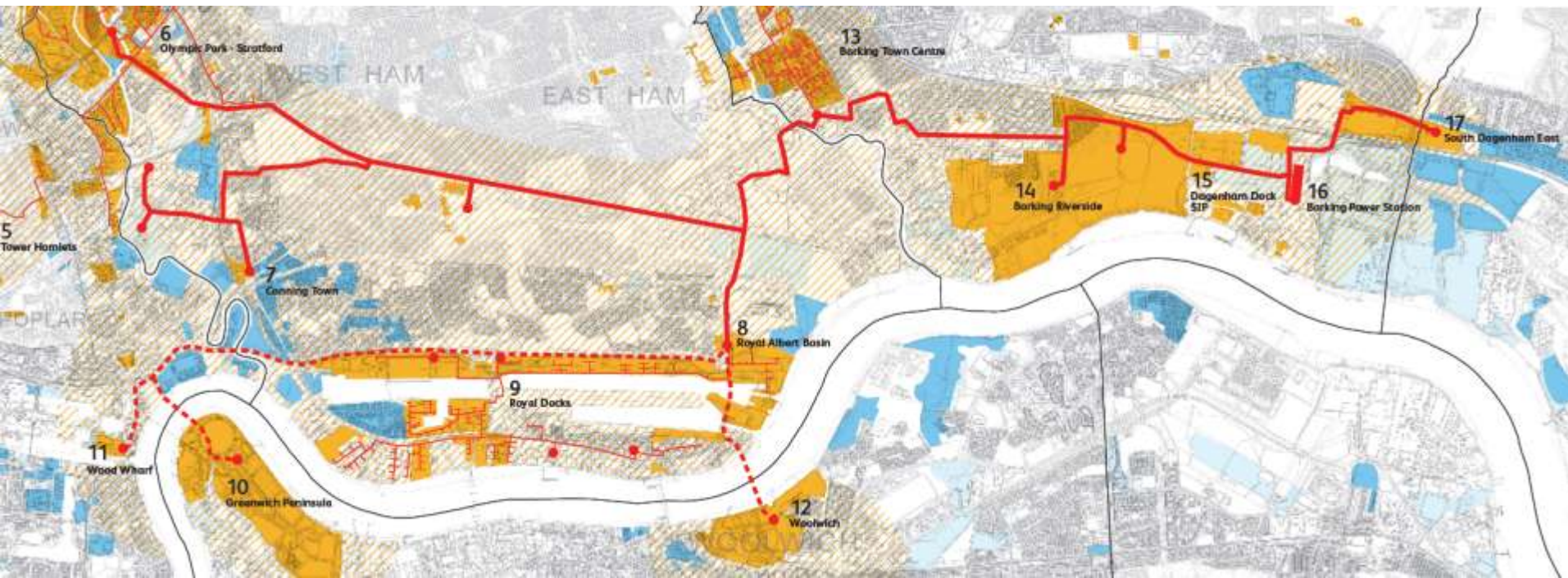




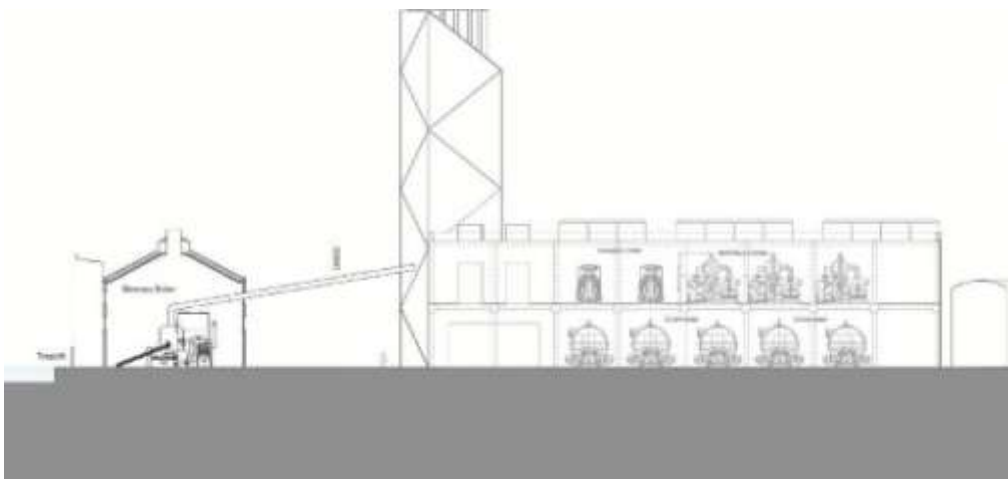
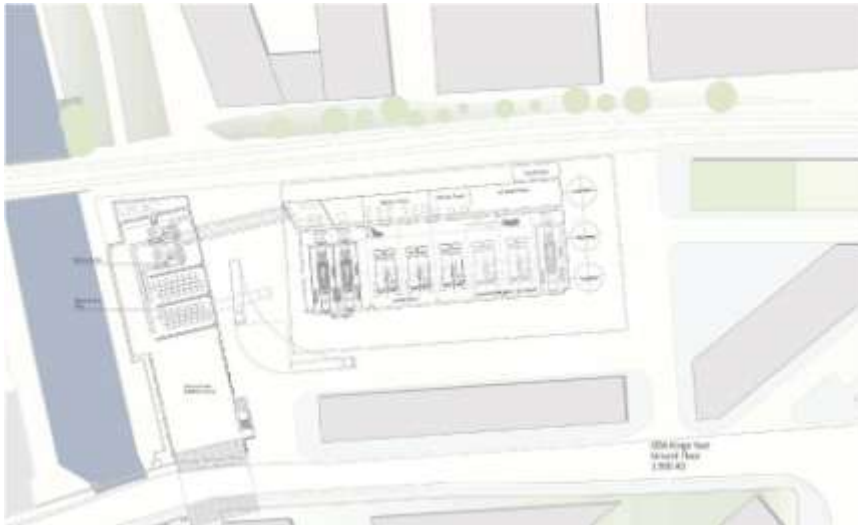
Some projects

London Thames Gateway Heat Network

- Barking Power Station – existing 1000 MWe gas fired CCGT
- 22km transmission main + distribution nets
- 100 MWth heat capacity + 100MWth future
- Commercialisation study underway by London Development Agency
- Capacity for 120,000 homes

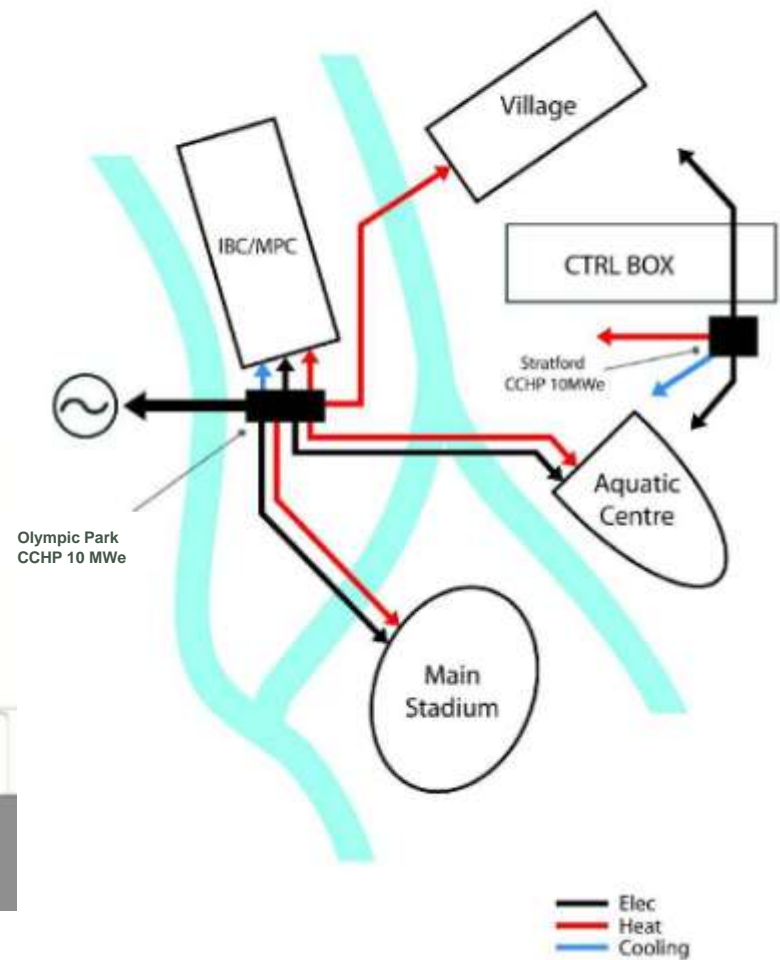


Olympic Park and Stratford City CCHP/DHC



CCHP Proposals

- 2 plants, 1 Olympic, 1 Stratford City
- Legacy networks serving permanent Olympic venues



Greenwich Peninsula CHP/DH system

- 10,000 homes, 350,000m² commercial
- 10 MWe gas engine CCHP
- 20% renewable energy – biomass/biofuel
- 20 km low temperature distribution network
- 20% CO₂ reduction
- Moving to 'zero carbon' after 2016

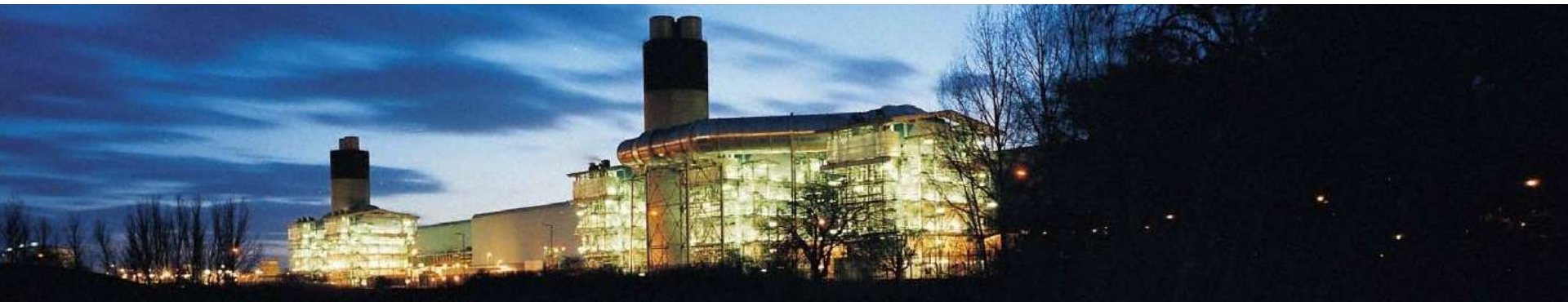


Summary

- 3.5 million tonne CO₂ saving / annum
 - 10% of London's emissions
- £~7 billion of investment
 - Public private partnerships
 - Need energy sector partners
- >200 MW under planning / construction now
- Capacity 1.8 GWe, 3.4 GWth in future

Local policy agenda is clear

- Now we need delivery



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Report available from:

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