

Low-Carbon London

Martin Powell

Director of Projects



CRC Commitment – What does it mean?

- A mandatory emissions trading scheme for the public and private sectors designed to cut energy consumption
- Targeted at those who use > 6000MWh per year (c£500000pa)
- Commences April 2010 with a three year introductory phase
- All participants ranked in a performance league table

- First year – no sale of allowances, end of year company reports emissions and forecasts for following year
- Second year – first Government sale of allowances at fixed price of £12 per tonne CO₂, no cap on allowances sold, and allowances may be traded at any price
- Third year – first capped phase, fixed number of allowances sold via auction, min floor price £12 per tonne CO₂

- Performance measured against three criteria
 - Absolute metric - % emissions reduction
 - Early action metric - % emissions voluntarily covered by Automatic Meter Reading and % emissions certified under Carbon Trust Standard
 - Growth metric- % emissions reduction per unit turnover

- Self-Supply double counting – operators of on-site electricity generation plant will need to report both the consumption of the primary fuel and the generated electricity which is then consumed – this double counting is then corrected through the grant of a ‘supply credit’, but EU ETS generating plant does not receive any self-supply credit.
- Renewables – do not qualify for a supply credit if ROCs of FiTs are claimed: this leads to a perverse result which penalises renewable electricity when compared with conventional generation.
- Waste and Fuel – are deemed consumed upon receipt, this will present a particular problem for waste and manufacturing industries, receiving materials for disposal or use other than as a fuel.
- Registration and disaggregation – for groups wishing to disaggregate significant group undertakings, the deadline for registration is brought forwards from September to 30th June 2010.



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Our Programmes

London is committed to playing its role

Today

2020

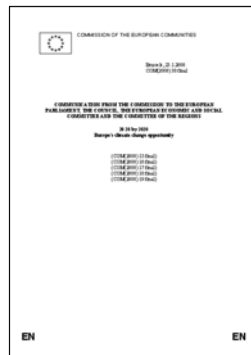
2025

2050

European 20-20-20
Target (2009)

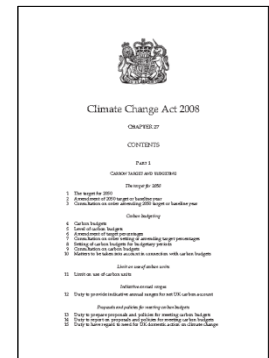
London Mayor's
Climate Change Target

UK Climate Change Act
(2008)



• Reduction in greenhouse gas emissions by **60%** below 1990 levels by 2025

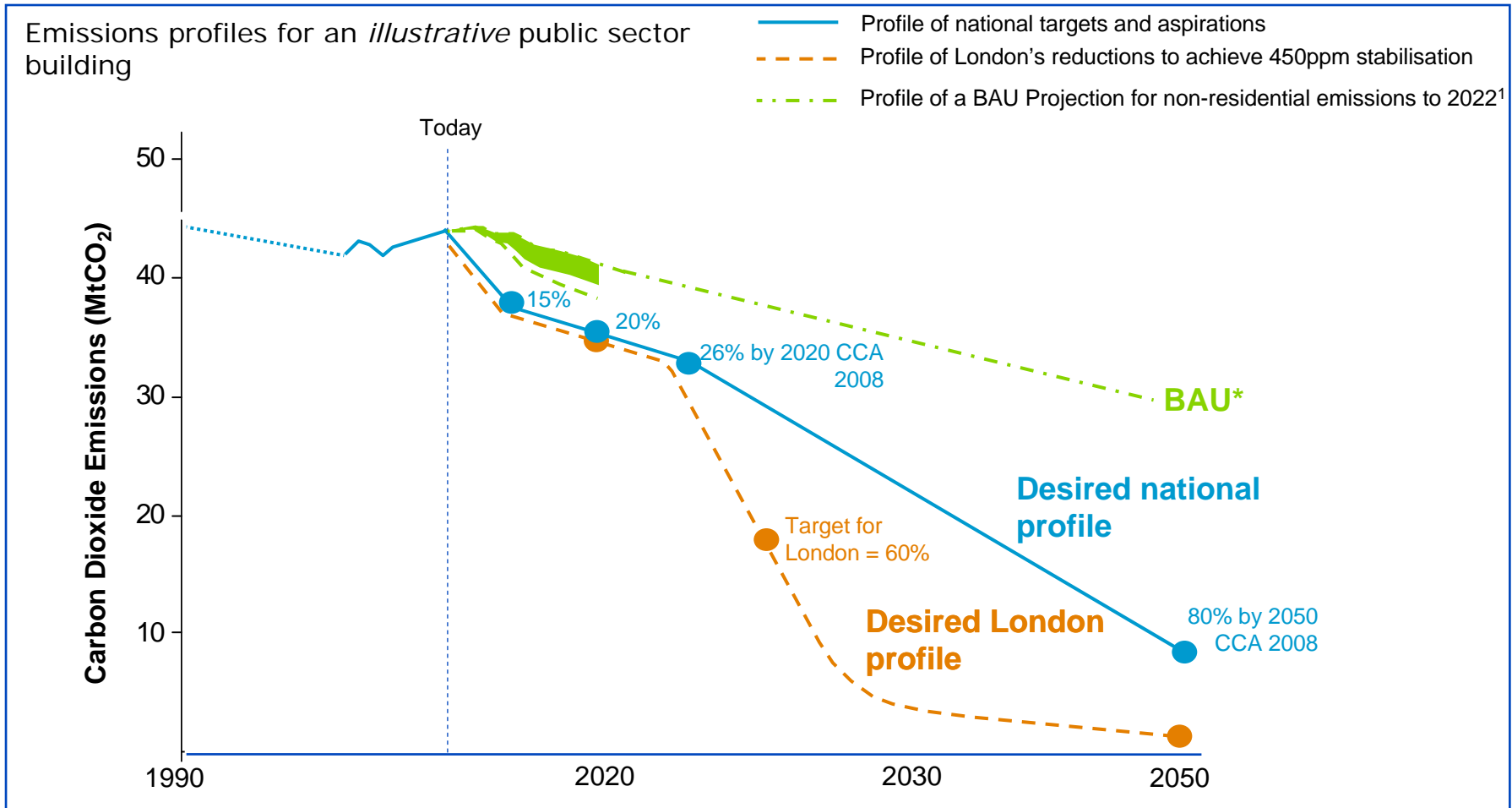
- Reduction in greenhouse gas emissions by **20%** below 1990 levels by 2020
- 20% increase in renewables
- 20% cut in energy consumption



- Reduction in greenhouse gas emissions by **80%** below 1990 levels by 2050.

The Mayor is committed to London becoming the greenest city in the world and to a city that becomes a world leader in improving the environment.

London has committed to ambitious carbon reduction targets



¹DECC modelling for CCC. Sources: CCAP (2006) CCC (2008) * Extrapolation based on CCA trend to 2022 for non-residential buildings

The Mayor and the GLA alone cannot deliver more than 15 per cent of the necessary reductions

Decreasing influence of GLA group but increasing impact of interventions

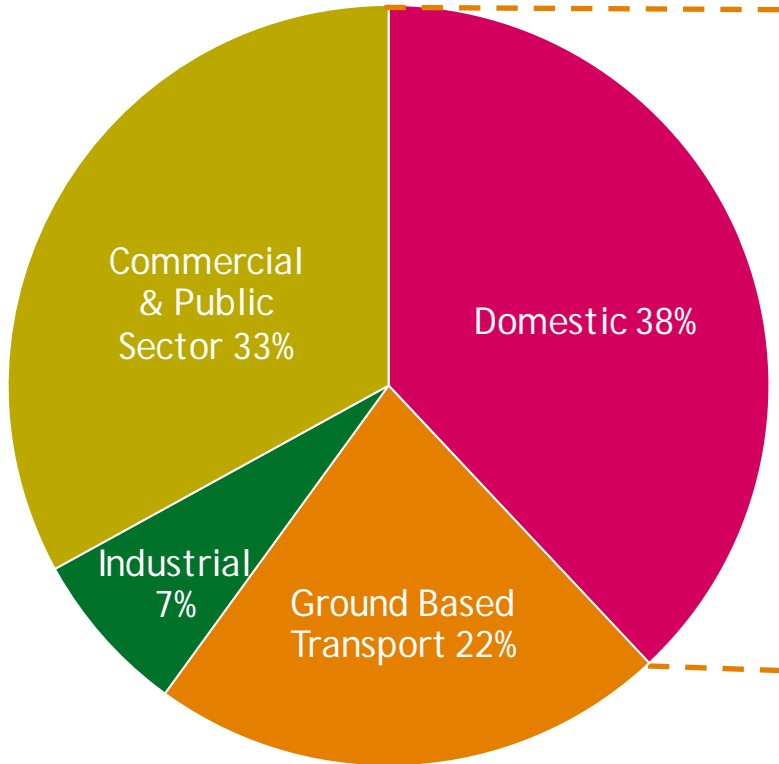


Responsibility for tackling climate change must be shared between the Mayor, the London boroughs (5-10 per cent of requirement), London's companies and public sector organisations (35-40 per cent), Londoners (5-10 per cent) and national government (30 per cent).

Energy use in existing homes is the largest single source of CO2 emissions in London

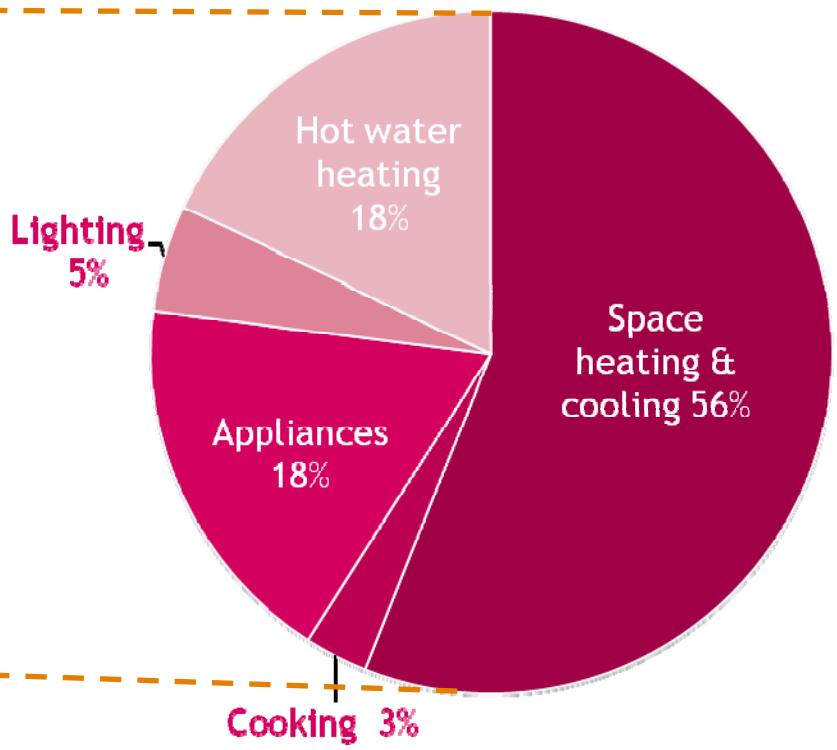
CO₂ emissions from London, 2006 (excluding aviation)

100% = 44.3 million tonnes CO₂



Domestic CO₂ emissions from London, 2006

100% = 16.7 million tonnes CO₂



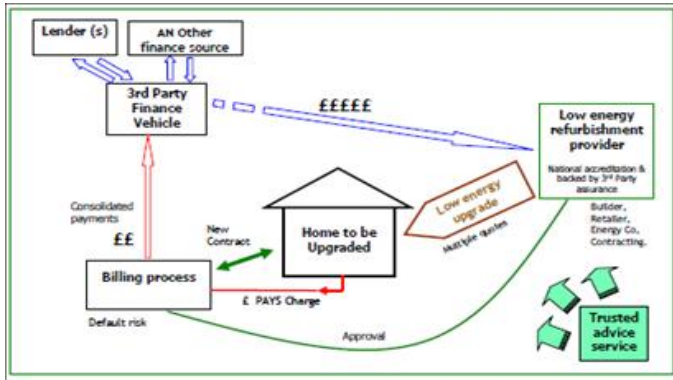
38% of London's total CO₂ emissions are from domestic housing. Almost three quarters of this is from space and water heating.

- Two parallel streams: building up market using housing funds (next 1-2 years); launch new, large-scale, financed model (next 2-3 years)
- Intensive joint working with London Councils/Boroughs on the business case. Building on experience with schemes in London.
- £1b could treat nearly 1.8m homes and deliver 3mt of CO2 savings p.a.
- At least 2,000 jobs creation potential
- A Retrofit Academy to deliver that supply
- 1000 homes trialling “10 easy measures”; Autumn 5x1000 homes demonstrating business model; 2010/11 50-200,000 homes demonstrate financed model

HEEP- in its early development stage but offers the richest abatement potential

- CO2 savings of 7 million tonne per annum possible by 2025
- Significant funding streams are available from utilities and government but are highly fragmented, so outcomes are compromised
- Total investment requirement in most likely case of around £5-7 billion
- LDA is working on privately funded PAYS Models

PAYS Model: 3 funding options but the RAB model appears most appealing



Consumer Loans

- Expensive, shorter tenor, incompatible with home mobility, and availability subject to credit checks
- Limited appeal unless government guaranteed/ subsidised (difficult in current tight fiscal environment) or secured as 2nd charge on properties (requires more work)
- Not a viable model

Regulated Asset Base (RAB) Model

- Standard menu of retrofitting options
- Assets booked on the regulated asset base of the electricity distributor
- There will be a charge on utility bills, authorised by OFGEM (UK Regulator), and collected by the supplier on their behalf
- Allows the cost to be spread over a long period, comparatively cheaply through bond markets
- Easy to administer – suppliers run a very efficient billing system
- Very low default rates on utility bills
- Easy to mix and match with government subsidy schemes
- Will require a degree of legislation, but will be far less political than the one involving munis
- Preferred option

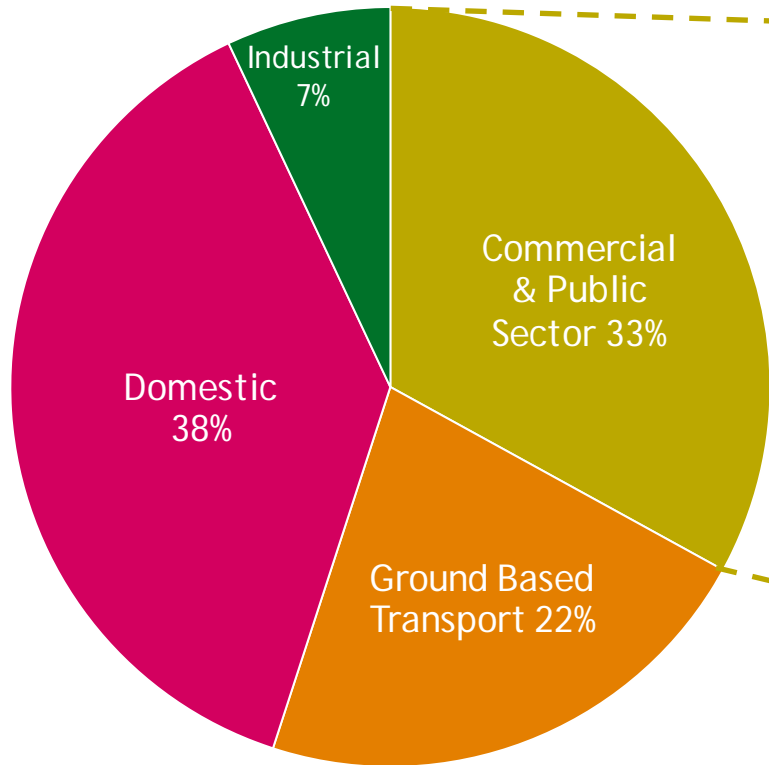
Local Authority (Municipal) Model

- There are 2 sub options: General Obligation (GO) borrowing and the intermediary model
- In 1st option, municipalities borrow on their balance sheet and recover it through a charge on the council tax bill of improved properties
- In 2nd option, it acts as a billing agent for 3rd party financiers but has enforcement powers
- In both options, loan is against a property, not individuals
- GO Model will be counted towards public sector debt, so of limited attraction to munis
- 2nd option would require a significant primary legislation
- Fall back option

Energy use in commercial & public sector buildings is the second largest source of CO₂ emissions in London

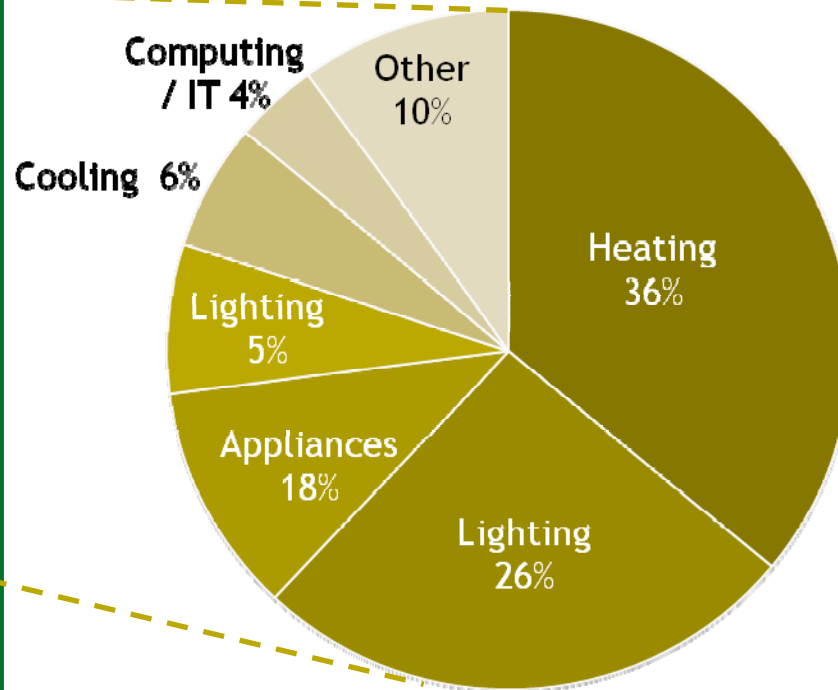
CO₂ emissions from London, 2006
(excluding aviation)

100% = 44.3 million tonnes CO₂



Commercial & Public Sector* CO₂ emissions from London, 2006

100% = 14.6 million tonnes CO₂



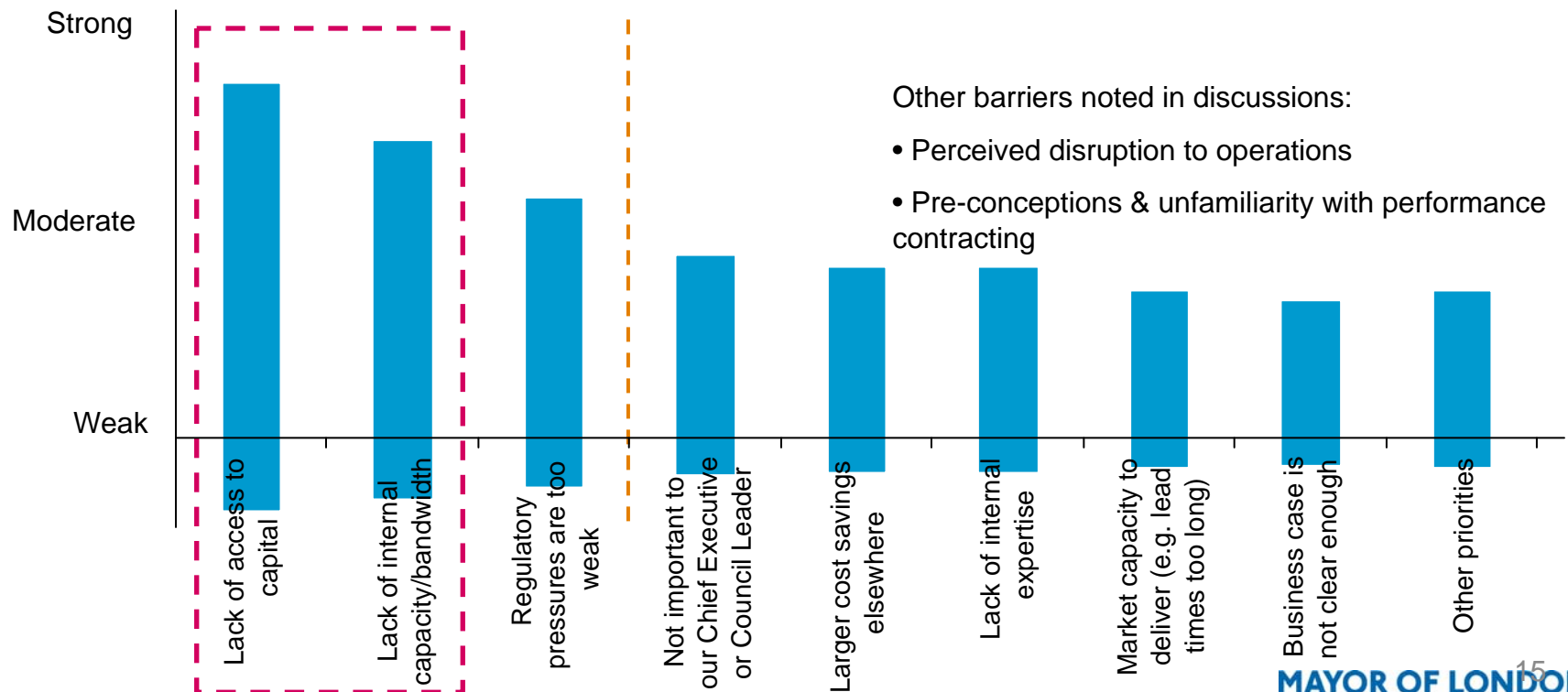
*Public sector: Health 23%, Education 47%, Offices 30%.

33% of London's total CO₂ emissions are from Commercial & Public Sector buildings. Over one third of this is from heating.

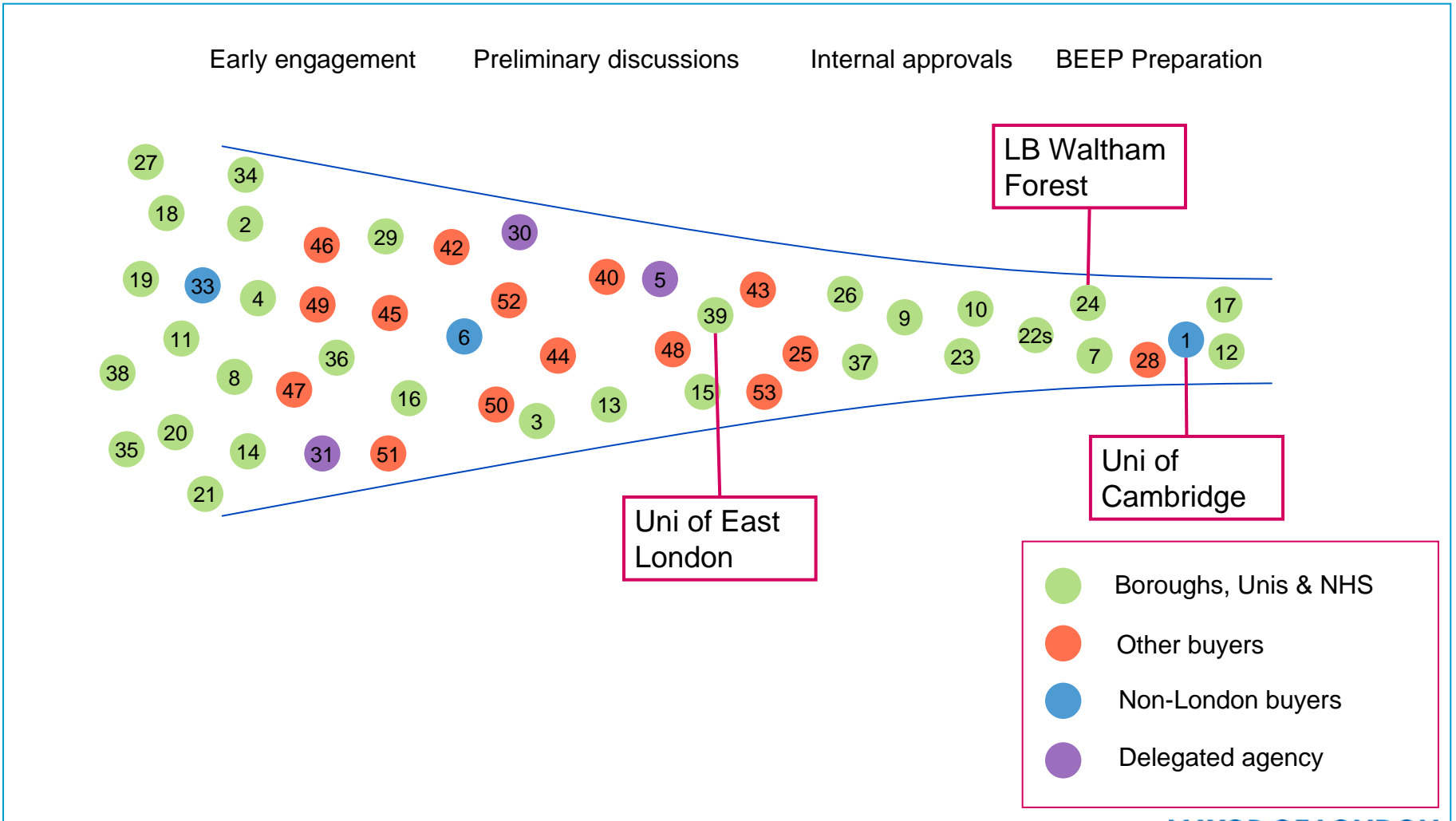
The challenge

A key challenge for London is making the existing building stock more efficient - delivering this at scale is not straight forward

- Most existing efforts are only delivering incremental carbon savings
- Most organisations face two major barriers: **capacity** and **capital**



>50 organisations are in the BEEP pipeline

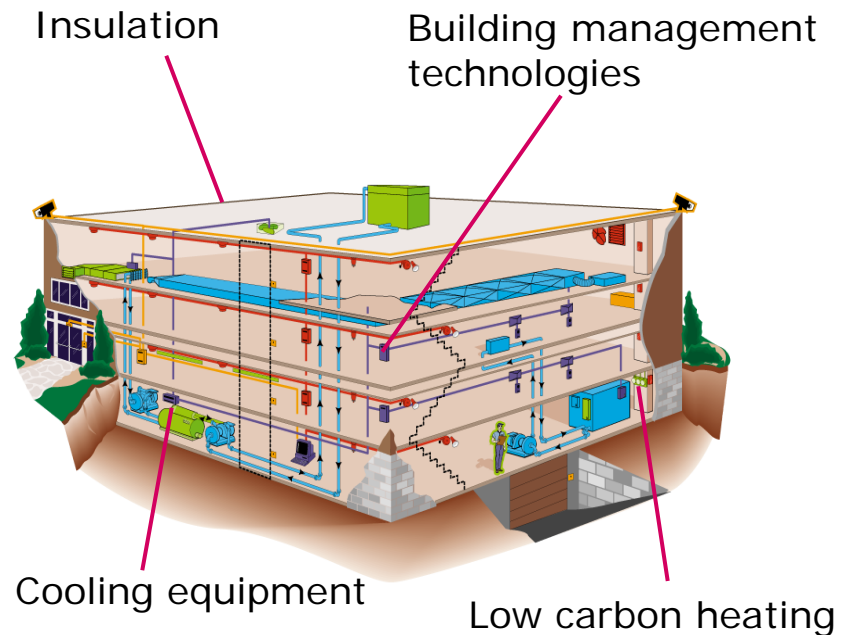


Building Energy Efficiency Programme

- It is a cost neutral means to reduce energy bills and carbon footprint of your buildings

• **Energy service companies (ESCOs)** guarantee a set level of energy savings - therefore financial saving - over a period of years

• **This guarantees a future income stream to fund investment in improvements**



- If all municipal buildings, schools, universities and hospitals were retrofitted, could save 1m tonnes CO2 and represents 2% of London's CO2 emissions

- Unique combination of carbon management service plus performance based annual awards
- Focus is on continuous, practical improvement in the carbon footprint of the organisation (not goods/ services supplied)
- Set a target, agree a plan, implement the plan, annual assessment

Better Buildings Partnership

- Comprising major commercial property owners
- Commits members to remove existing barriers
 - Leases
 - Agents
 - Valuation
- Carbon benchmarks for all members on their London portfolios
- Annual public awards by the Mayor for reaching the agreed benchmark

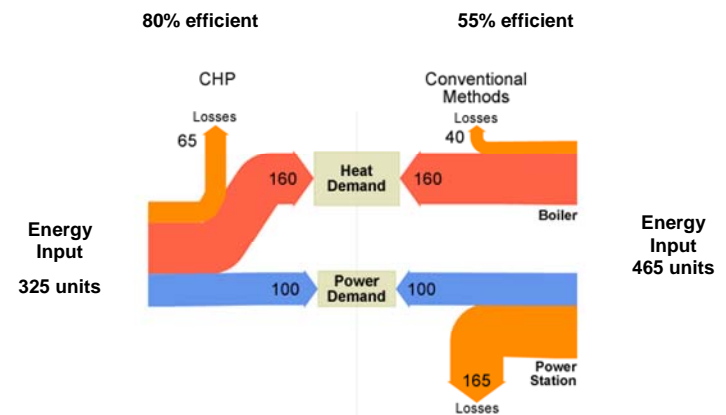


- Targeting 25% of London's energy supply from DE by 2025
- Includes Barking power station CHP (renamed Thames Gateway Heat Network), aiming for first heat delivery in 2011
- Three new areas of focus through LDA Decentralised Energy Delivery Team
 - ❖ London-wide energy masterplanning (2-year programme)
 - ❖ Technical and commercial centre of excellence including borough 'SWAT team'
 - ❖ Part-financing for specific projects
- Low Carbon Zones – prospectus launched May 2009, winning zones announced Autumn 2009

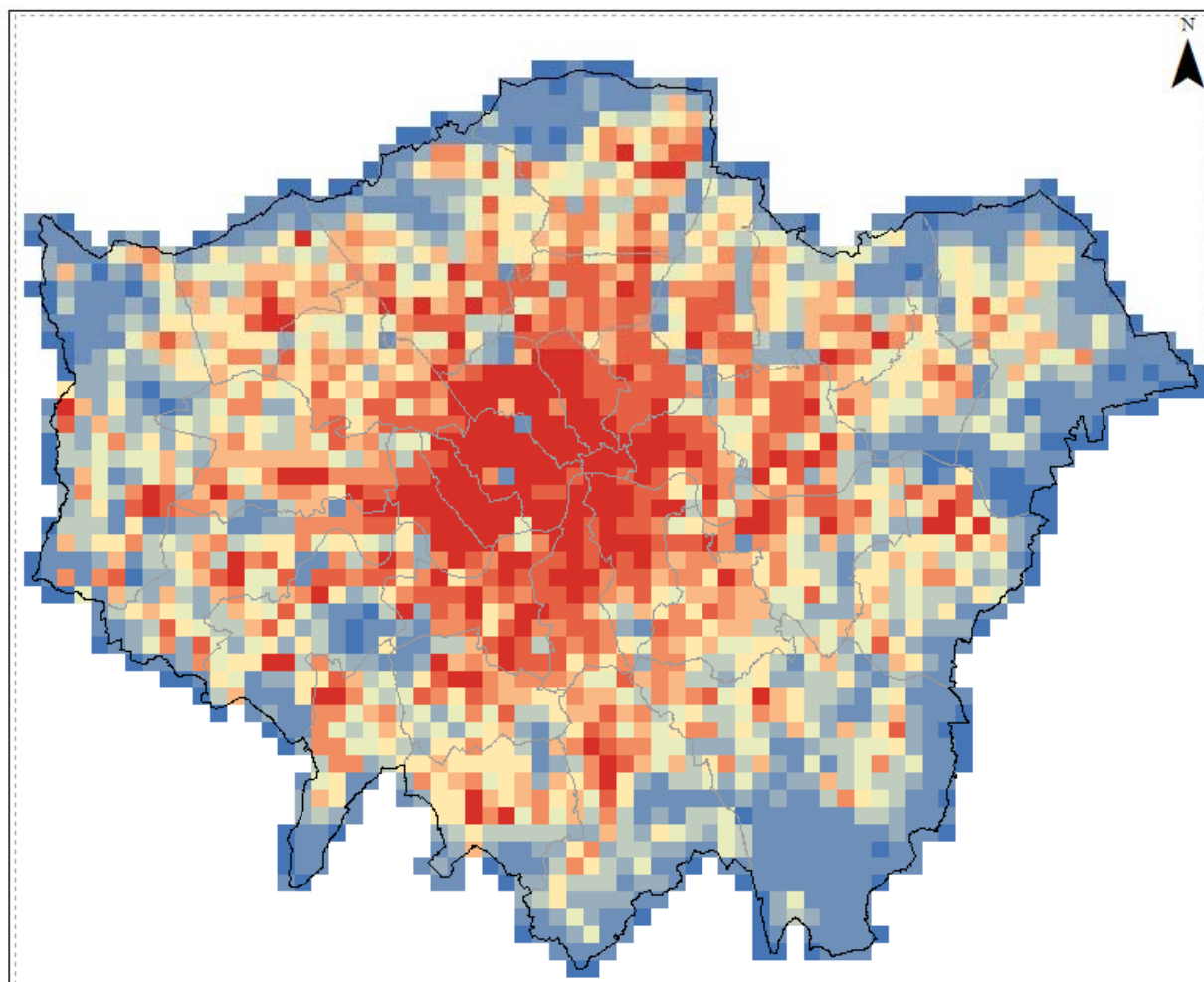
Decentralised Energy not just offers significant CO2 abatement opportunity but is also financially viable

- London target is to deliver 25% of its energy needs from decentralised sources by 2025.
- This requires building gas power combined heat and power (CHP) plants which deliver electricity to the National Grid and excess heat to buildings in the local area via a network of pipes.
- Total potential investment c.6.0-8 bn
- Estimated payback period of 7-10 years
- CO2 emissions savings of up to 2.0-4.0 m tonnes p.a

Why Does DE Save Money?



- London Community Heating Development**
- Boundaries
 - GLA Boundary
 - Borough Boundaries
 - OS Layers
 - 50k Raster
 - Mastermap Topography Area
 - Development
 - Potential DH partner sites
 - 2005 CH Study Outputs
 - Actual Building Locations (Addresspoint)
 - Priority Areas, 2009
 - Contour factors for priority area identification
 - Input maps
 - Heat Demand (per building)
 - kWh/building, 850m grid
 - kWh/building, 50m grid
 - Heat Load Diversity (50% Diversified, 8: kWh/year (50% diversified)
 - 0
 - 1 - 4,033,201
 - 4,033,202 - 9,679,682
 - 9,679,683 - 14,519,523
 - 14,519,524 - 18,552,724
 - 18,552,725 - 23,392,565
 - 23,392,566 - 29,039,047
 - 29,039,048 - 37,912,089
 - 37,912,090 - 55,658,173
 - 55,658,174 - 205,693,248
 - Social Housing
 - Social Housing dph, 850m grid
 - Fuel Poverty Indicator
 - FPI, 850m grid
 - FPI, census output areas
 - Total Heat Demand (per grid square)
 - Heat Demand, 50m Grid
 - Heat Demand, 100m Grid
 - Heat Demand, 200m Grid
 - Heat Demand, 200m Grid
 - Heat Demand, 800m Grid
 - Heat Demand, 800m Grid
 - Economy 7 Heating (not used in modellin
- Inset map



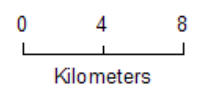
London Community Heating Development Study 2009

CSE on behalf of the Greater London Authority

19 June 2009

joshua.thumim@cse.org.uk

- GLA Boundary
- Borough Boundaries

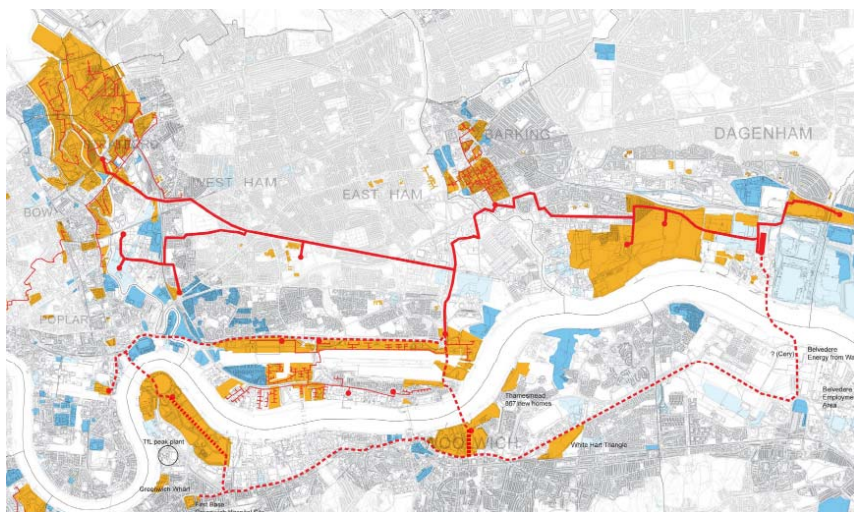


1:245,000 @A4



Barking – a type 2/3 project:

- Heat sourced from Barking Power Station
- Combined cycle gas turbine plant (CCGT)
- 1,000MWe from 5 gas turbines and two steam turbines

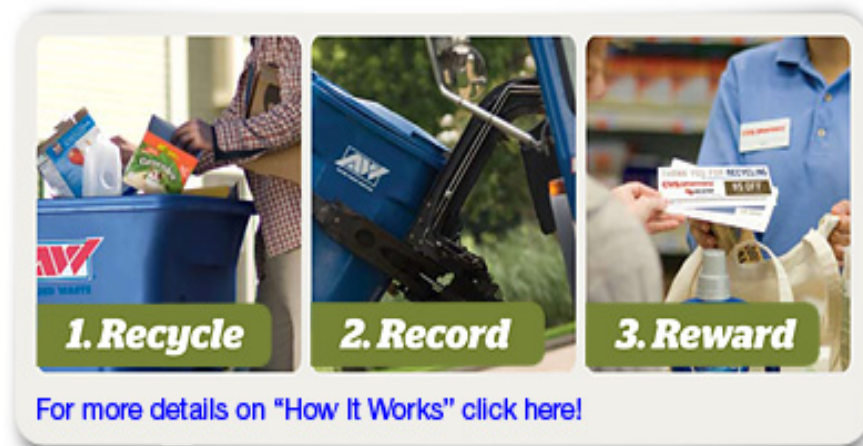


- Project Headlines
- Peak heat load – 462 MW (18% existing/82% new developments)
- Heat network capacity – 280 MW
 - ❖ Supplies 90% of annual heat demand
- Project cost – circa £120m
- Total network length – 23 km

Benefits

- Potential to supply > 120,000 homes with their space heating and hot water requirements
- Could save > 96,000 tonnes of CO2 per annum

- £2b of £12b London's energy consumption could be delivered through energy from waste
- 3-year, £84m London Waste and Recycling Board fund-142 bids ranging from £5k to £10m; first disbursements expected September 2009





- Bike hire scheme May 2010; 12 'cycling superhighways' by 2012
- Full hybrid conversion of 8,000 vehicle bus fleet
- LED traffic light conversion underway; street lights?
- Securitising Underground electricity use?

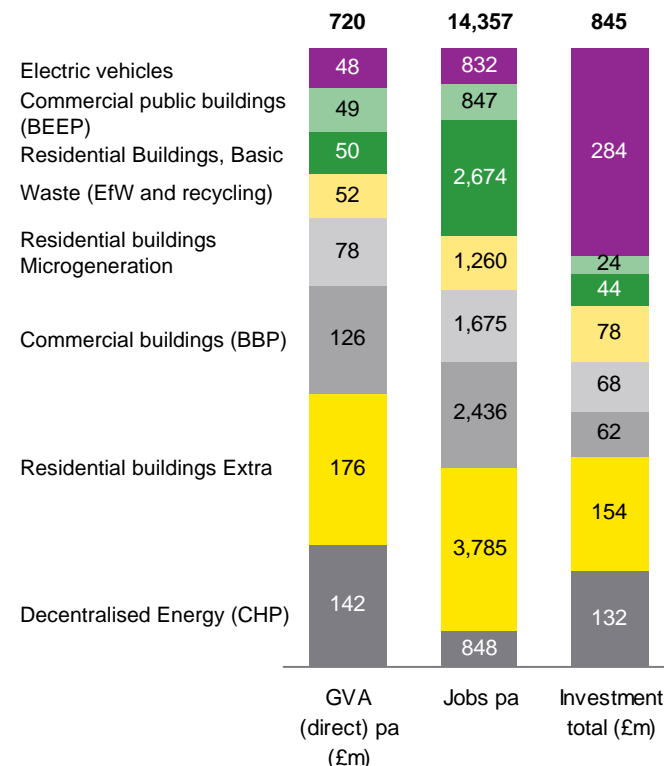
- Electric Vehicle Delivery Plan launched June 2009
- Own fleet: Delivery Plan Autumn 2009, start procurement early 2010 (1,000+ ultra low carbon vehicles)
- International EV procurement initiative with Clinton Foundation

- 10,000 new street trees
- Air quality action plan by Summer
- Range of urban realm improvements (Exhibition Road, shared space, etc)
- 10% increase in central London green space would stabilise temperatures over the next century
- New London Plan including Green Grid extension, green roofs, further protection for green space



Capturing the Benefits of a Low Carbon Economy

- Ernst & Young research has identified an incremental £3.7bn of low carbon investment for London in addition to the estimated £21bn of low carbon economy already attributed to London. [Innovas report 2009]
- The Mayor's proposed low carbon initiatives identified 14,000 gross jobs per annum and £720 million per annum of Gross Value Added opportunity for London
- We have a scale of opportunity in:
 - Retrofit
 - Waste
 - Decentralised Energy
 - Transport



- Carbon trading
 - London the dominant player in a small but iconic market. Highly mobile; others are targeting it
 - 39% of Clean Development Mechanism Market
 - 80% of EU ETS futures and Options Contracts traded in London
- Finance
 - Big opportunity for finance sector to create new structures and financing mechanisms for Retrofit, Waste, DE, Transport...
 - Securing the UK's Energy Future (£199bn required to 2025 to meet energy goals for 2050)
- Business services
 - Law, design, engineering, etc. with significant export potential
- R&D/ academia
 - London as academic hub, R&D less competitive than perhaps should be

**No city has yet found a way
to de-carbonise without
sacrificing economic
growth.**

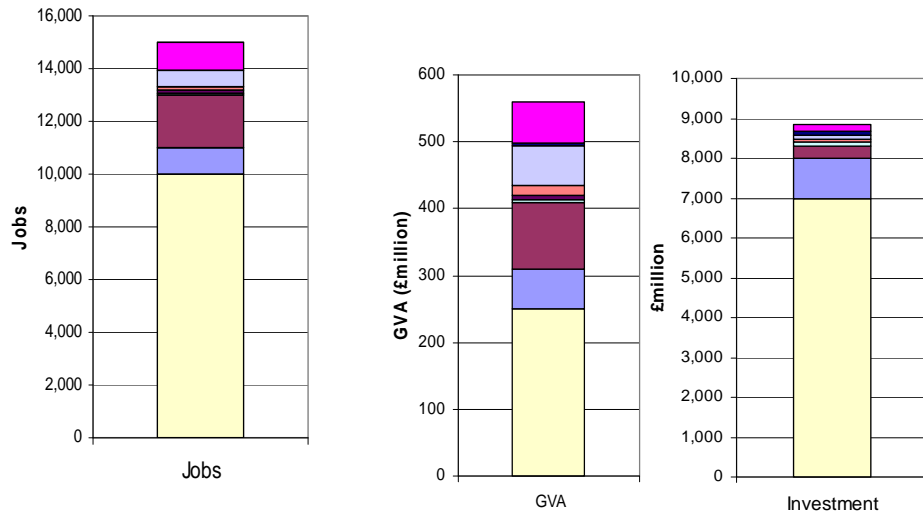


- CO2 reduction and economic growth are on the same continuum.
- Actions will be at points on this continuum
- Series of compromises
- We need to optimise not maximise
 - Creating the conditions that promote economic growth but allow us to realistically meet the 60% target.

The benefits of these initiatives will combine with those of the existing Mayoral initiatives, growth in London

–Estimated impact of recommended projects on the economy

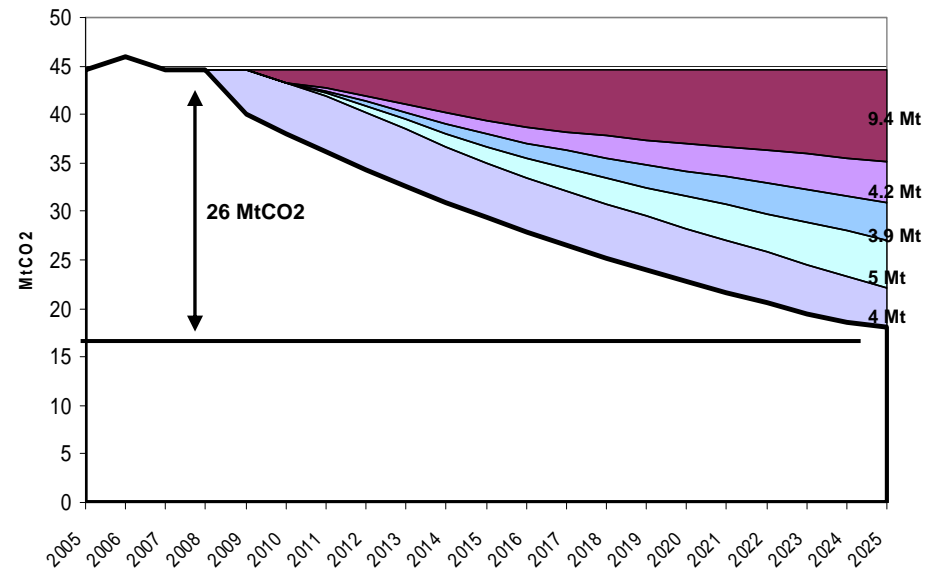
•Impact of recommended projects on London's GVA (annual), jobs (annual) and level of investment (overall to 2025).



- Retrofit financing mechanism
- Data centre clusters
- Early stage project underwrite
- Emissions Management tool
- Low carbon innovation clusters

- Low carbon index on FTSE/AIM
- Procurement options for London
- National Centre for Carbon Measurement
- Carbon management for infrastructure project

–Estimated impact of recommended projects on Mayor's carbon reduction target



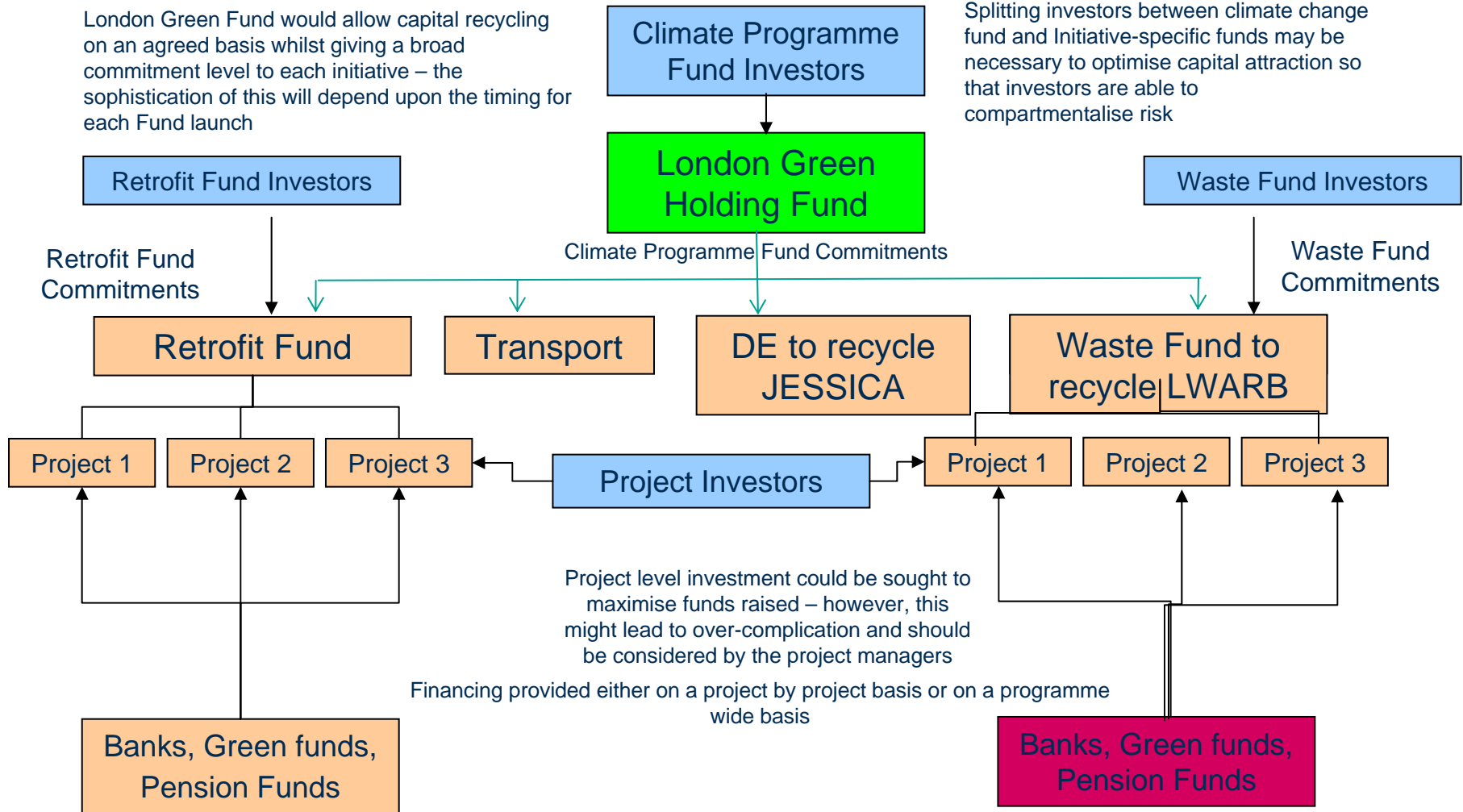
- Target
- Other identified actions and projects
- Expected from LCC priority projects
- Required national contribution
- Potential from LCC priority projects
- Mayor's Plan

Source: Ernst & Young

London Green Fund – Illustration of End Result

London Green Fund would allow capital recycling on an agreed basis whilst giving a broad commitment level to each initiative – the sophistication of this will depend upon the timing for each Fund launch

Splitting investors between climate change fund and Initiative-specific funds may be necessary to optimise capital attraction so that investors are able to compartmentalise risk



Addressing behaviour
around Energy Efficiency
leads to addressing Energy
Supply

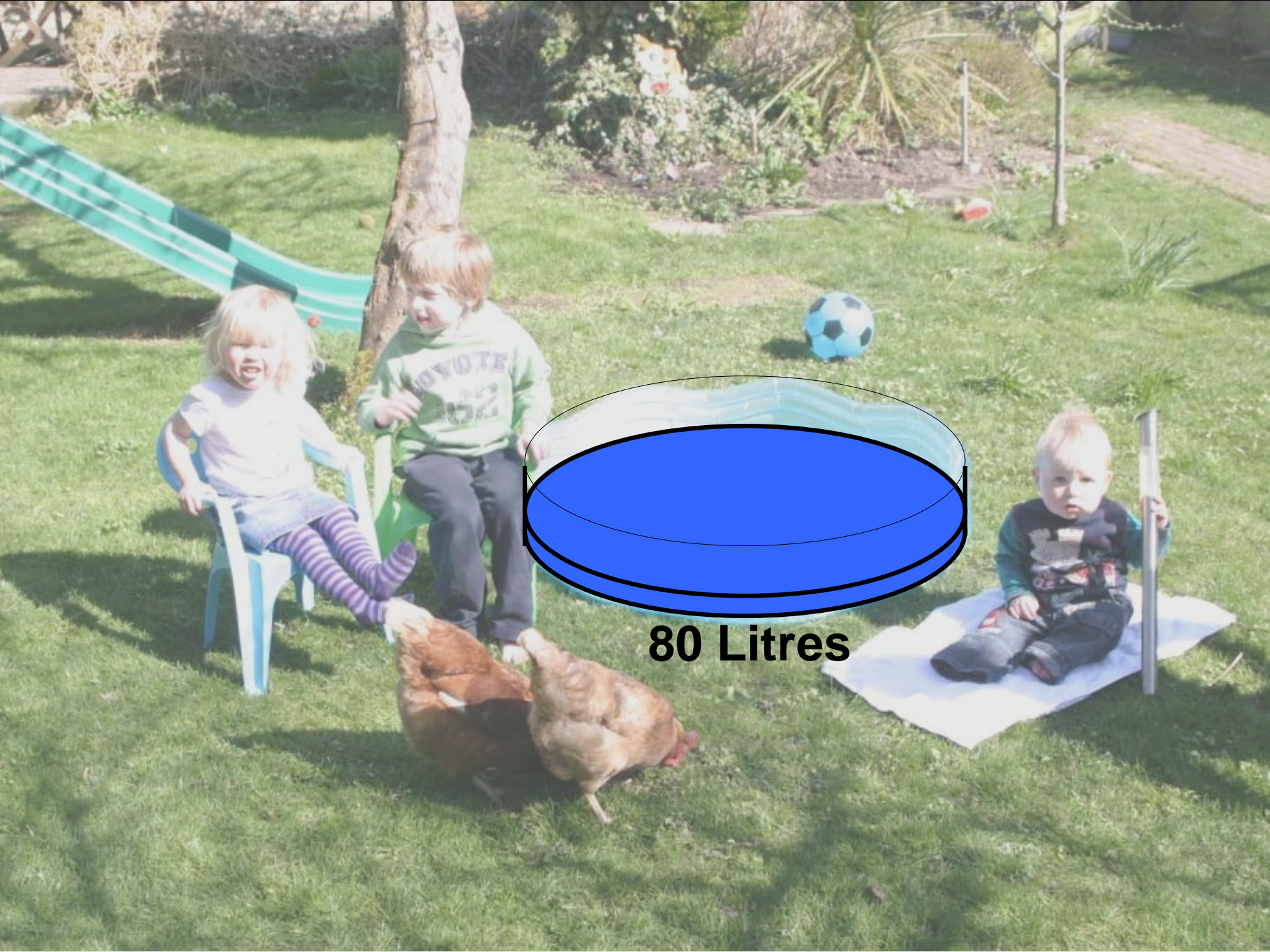
Hard to Picture a KWh or a
Tonne of Carbon



2

The Final Challenge





80 Litres

- London has set some challenging targets
- A mix of Interventions is required to deliver these targets
- Varying models of delivery is essential for success
- Cities have the most to do and the most to gain
- All cities are different but the challenges are the same
- We can learn by replicating what is successful in cities and adjusting the approach to ensure the right delivery mechanism to enable action at scale!

Thank You!

martinpowell@lda.gov.uk

