

Low Carbon London – Energy and Planning

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(Please read the notes below each slide when downloading)



London's Size & Complexity



London's population is expected to grow by 800,000 by 2016 – some 330,000 new homes needed

Over 300 languages are spoken in London every day



3 of 5 most deprived councils in England are in London + worst regional unemployment problem

A sustainable footprint – the size of the London challenge

- London uses a land area the size of Spain (twice the size of Great Britain) to support its needs. If the world lived like the UK, we would need the proverbial 3 planet earths to meet demand



- Emission reduction targets need to shape new economic development on a fair and equitable basis – between and within generations and countries – and be based on best science in order to avert catastrophic climate change and sea-level rise

The challenge – turning aspirations to be greener into actions that matter

- In UK, people now believe a sustainable home is: modern (90%); attractive (72%); hi-tech (79%); fashionable (78%); good value for money (72%)
- BUT while 90% of people broadly accept the science, and 70% say they are willing to change – ONLY 20% are changing carbon behaviour slightly (buying local food, recycling, driving car less) and only 5% changing significantly

Sources: Ipsos-Mori 2007; Energy Saving Trust 2007

Changing carbon-heavy behaviour ultimately means changing ...

- **Attitudes**
- **Values**
- **Beliefs**
- **AND MARKETS**

The biggest block to behaviour change ...

**As long as it is cheap, convenient
and legal to waste carbon and
natural resources, then that is what
the great majority of individuals,
households and companies will do**

...

at work, home and play.

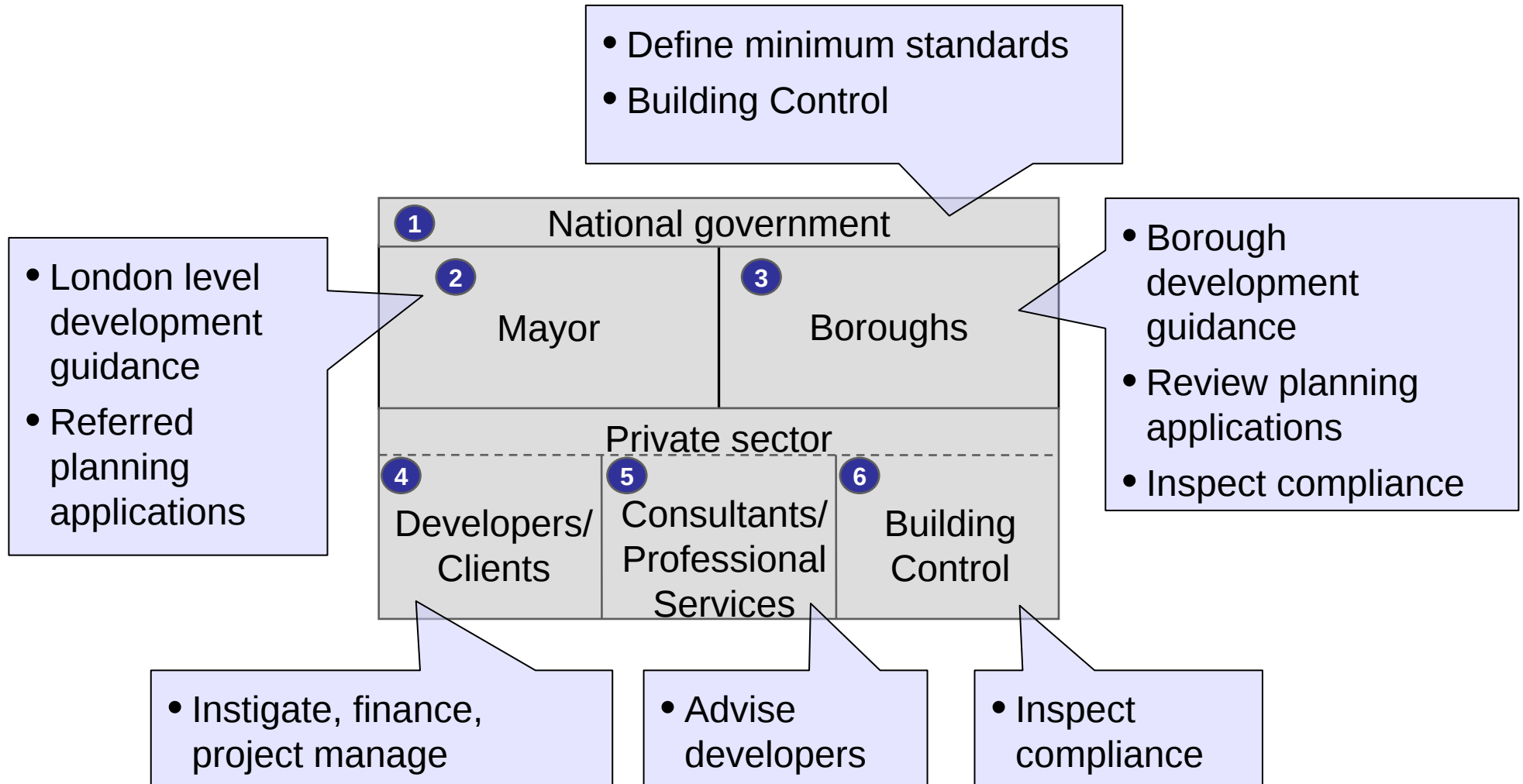
So, what works ...

- Laws and Regulations to ban/restrict unsustainable behaviour
- Polluter Pays Levies and Charges – *if* revenues are recycled into building up low carbon solutions (infrastructure, technologies, products)
- Financial Incentives – grants, discounts, rewards for low carbon choices and behaviours
- Focused Advice and Assistance programmes that are convenient to access for user, and help navigate a muddled market-place
- Widely available information on problems, causes and solutions (especially when help individuals, families companies in short-term)
- Exemplar Best Practice – ‘seeing is believing’
- Partnerships across public, private, domestic and voluntary sectors
- Respected Champions
- Coordinated and demonstrable international action

London's principle development and energy plans

- **The London Plan – Mayor's over-arching planning and spatial development strategy – first 2004 - covers all aspects of city development - boroughs' local plans must be in 'general conformity' with it - Mayor is also required to produce other strategies (Transport, Energy etc) - consistent with each other, national policies and international obligations + three crosscutting themes: the health of Londoners; equality of opportunity; contribution to sustainable development in UK - European Spatial Development Perspective/EU directives.**
- **The London Economic Development Plan – follows from the London Plan – drawn up by The Mayor's Office and the London Development Agency principally, with major input from the Greater London Authority**
- **The Mayor's Climate Change Action Plan**
- **New Mayoral powers on planning, housing, learning and skills, water, energy and climate change – many statutory effect.**

Integration challenge: new build



Blocks to uptake of renewable energy in UK/London

- **Lack of statutory targets – Planning Policy Statement 22 (PPS22) ‘Planning Guidance on Renewable Energy’ in 2004
- The Merton Rule (10% of renewable energy in new developments); Mayor guidance 20%; Olympics 20%.**
- **Confused and frequently changing Government grant systems for local and micro- renewable energy schemes (Government funding scheme - ‘The Renewables Obligation’ - consistent support for large wind schemes)**
- **Local authority opposition and public opposition to wind in many rural areas**
- **Ignorance of planners and developers of policy, costs and technical options/quality**

London guides for planners, developers and consultants

- **Planning policy: making it work**

The project report 'Capacity building for planners and others implementing energy-related planning policy in London' acts as a resource for planners, engineers and developers and aims to increase understanding of and receptiveness to energy related planning policy. The project provided advice and support to planners in a number of London Boroughs and information to engineers and architects. Recommendations include assistance in the form of training, the distribution of glossaries of typical terms used and the increased need for technical support for borough planners to implement energy policies.

- [Capacity building for planners and others \(PDF, 703 KB\)](#)

- **Capacity building on sustainable energy planning policy and new build**

After the launch of 'Integrating renewable energy in new developments: Toolkit for planners, developers and consultants', London Renewables (now part of the London Energy Partnership) provided training and pilot support to London borough planners, councillors and housing associations and developers. The report from this work, 'Sustainable energy training and pilot support programme for local authorities' has fed into onward support through the London Energy Partnership to London borough planning officers for development-specific support and to designers on implementing energy-related planning policy. The LEP's project complements a support service which developed from the pilot support programme.

- [Sustainable energy training and pilot support programme for local authorities \(PDF, 555 KB\)](#)

The London renewables toolkit

- **Tools and Information for planners and the development and design community**

Developed for London Renewables, the toolkit aims to provide planners and developers with:

- An overview of the renewable energy technologies and their costs
- An understanding of planning requirements and methods for meeting them
- Information on policy formation for London Borough planners
- [Integrating renewable energy into new developments: Toolkit for planners, developers and consultants \(PDF, 4.90 MB\)](#)
- **A series of summary documents has also been produced:**
- [Summary for planners \(PDF, 174 KB\)](#)
[Summary for developers \(PDF, 182 KB\)](#)
[Summary for councillors \(PDF, 124 KB\)](#)
[Summary for housing associations \(PDF, 162 KB\)](#)
[Summary for architects \(PDF, 167 KB\)](#)
[Summary for property management companies \(PDF, 247 KB\)](#)
- For regional planning documents – the [London Plan](#), the [Supplementary Planning Guidance on Sustainable Design and Construction](#) and the [Further Draft Alterations to the London Plan](#), visit www.london.gov.uk.

The Mayor's new powers

- **Planning**
- The Mayor will be able to direct changes to boroughs' programmes for the local development plans they produce.
- The Mayor will have a stronger say on whether draft local development plans are in general conformity to his London Plan.
- The Mayor will have the discretion to determine planning applications of strategic importance.
- **Climate Change and Energy**
- The Mayor will prepare and publish a statutory Climate Change and Energy Strategy for London, stating how the capital should minimise emissions of carbon dioxide by the use of energy in London, help to eradicate fuel poverty; and harness economic opportunities for London from investment and innovation in energy technologies and energy efficiency.
- He will also prepare and publish a statutory Climate Change Adaptation Strategy setting out how the capital should adapt to the effects of climate change.
- The Greater London Authority will be subject to a specific duty to take action to mitigate the effects of climate change and help London adapt to its unavoidable impacts.

Action Today to Protect Tomorrow: The Mayor's Climate Change Action Plan

LONDON
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2

Approach to developing the London CCAP

1. **Baseline**: London's 1990 and 2006 CO₂ footprint

2. **Future emissions**: What will London's emissions be under 'business as usual'?

3. **Targets**: What CO₂ reductions are needed for London to play its role in stabilising global temperatures?

4. **Quantified actions**: How can London deliver these targets?

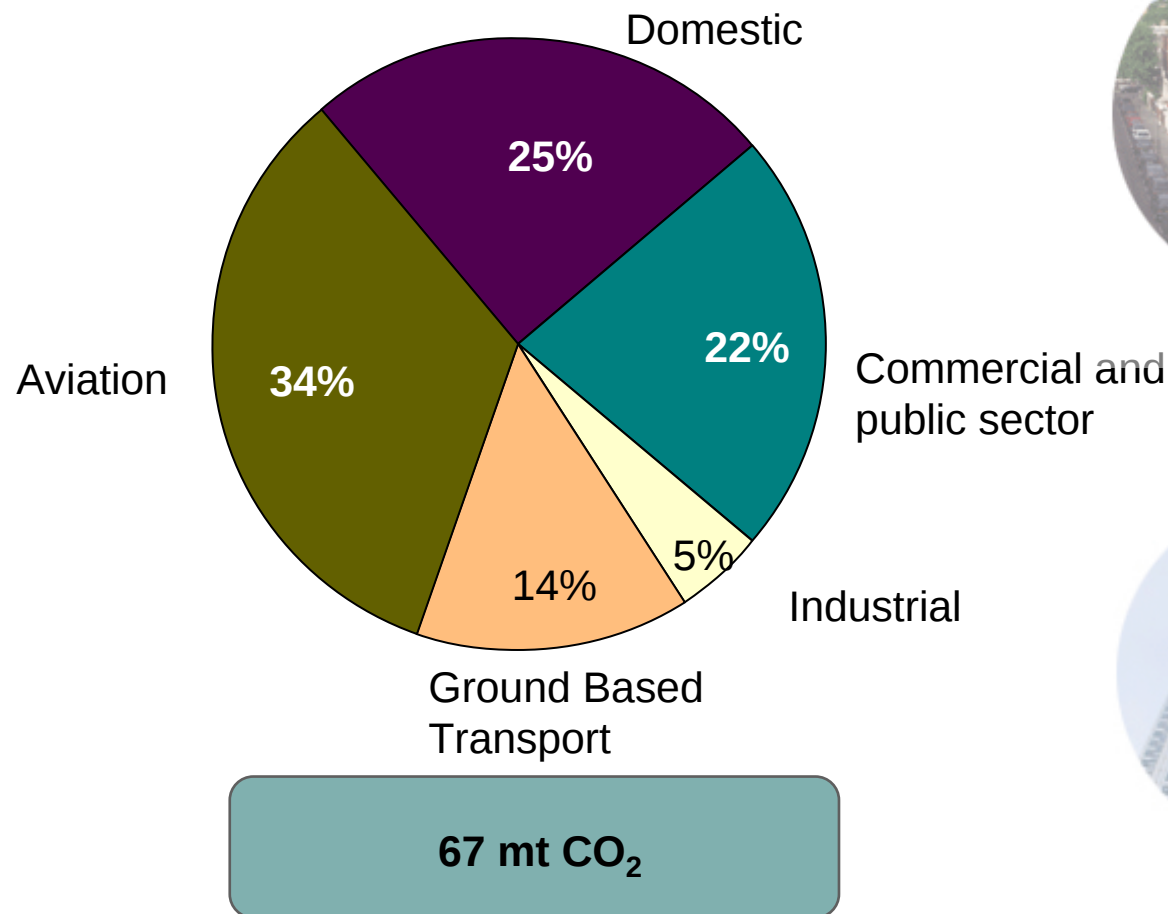
5. **Cost/benefit**: At a high level, what would the actions cost and what will be the CO₂ benefits?

6. **Implementation**: What do we need to do to make this happen?

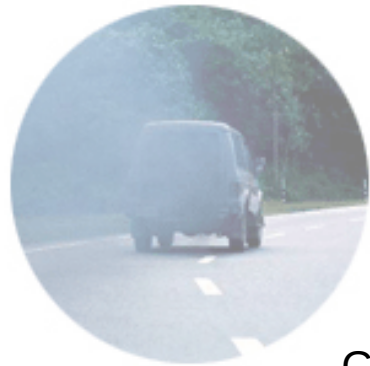
The London Climate Change Action Plan is based on an enabling framework that helps ...

- 1. Deliver needed economic and social benefits – many skilled and low-skilled jobs ... inward investment ... lower resource costs for households and companies ... carbon trading to keep The City as premier global financial ... economic efficiency, innovation and modernisation ... higher quality of life ... a cleaner, more liveable city**
- 2. Create Partnerships – between public, private, voluntary and domestic sectors**
- 3. Integrated cross-sector action in energy, waste, transport, buildings**
- 4. Create the conditions for businesses, communities and families to act**
- 5. Maintain standards of living (and improving for disadvantaged families and communities)**
- 6. Best science-driven targets and a long-term perspective**

CO₂ emissions from London including aviation (2006)



London CO₂ emissions (excluding aviation) 2006



Ground Based
Transport



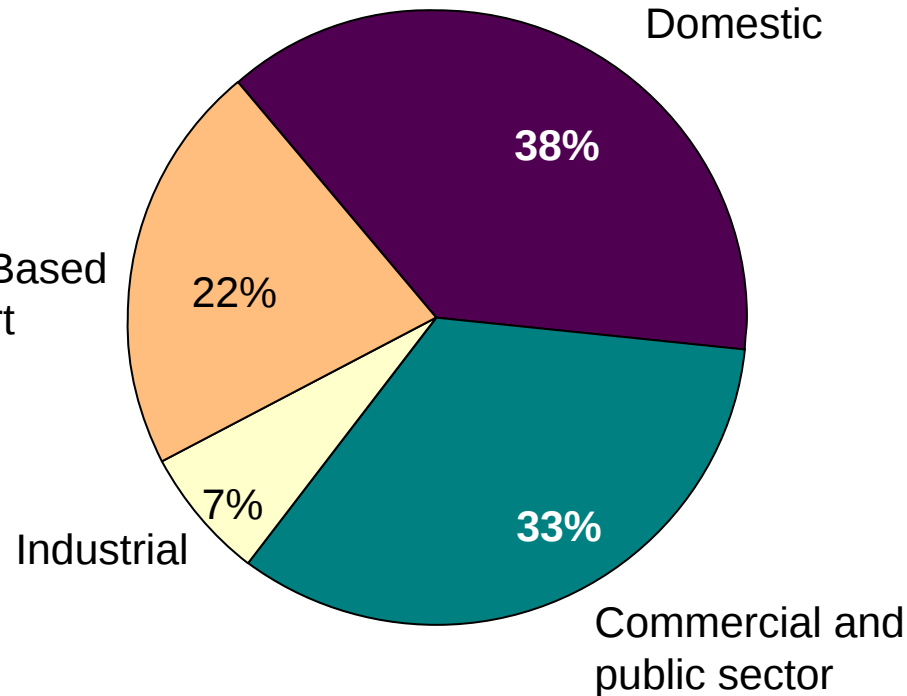
Domestic



Industrial

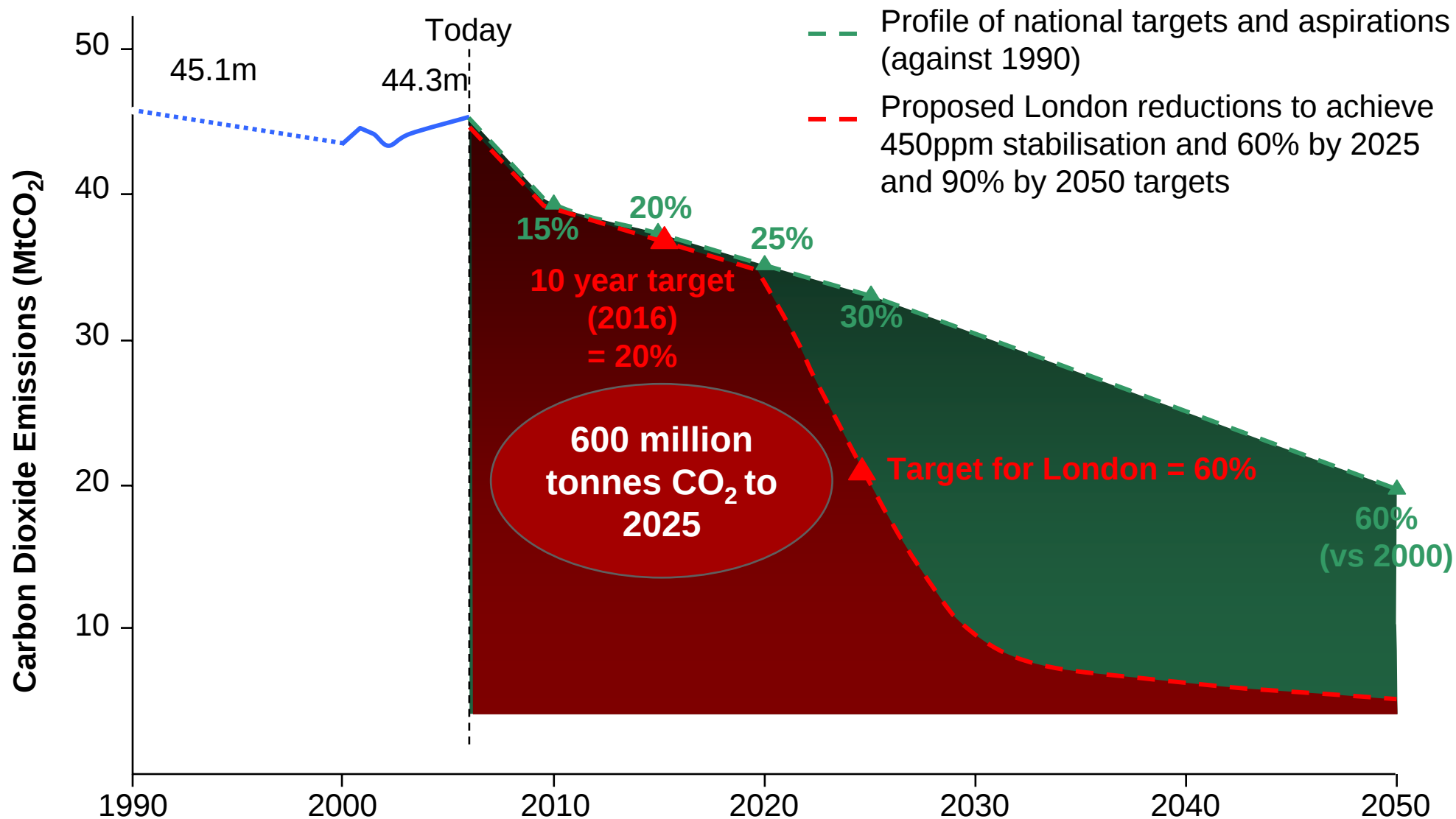


Commercial and
public sector



44 mt CO₂

Required CO₂ reductions



Easy opportunities to reduce household emissions – so why don't people do them?!



Simple behavioural change by all Londoners could reduce CO₂ emissions by **2.3 million tonnes** and cut fuel bills



If all light bulbs were energy efficient, London would save **575,000 tonnes of CO₂** and **£139 million** per year (2006 prices)



Major reductions from home insulation and **help solve fuel-poverty** in **4-500,000 homes** in London

Four new programmes to help Londoners and businesses change behaviour and reduce

- **A Green Homes Programme**
- **A Green Organisations Programme**
- **A Green Energy Programme**
- **A Green Transport Programme**

Private sector – BedZED ‘0’ carbon development in Wallington



BedZED

Located in Wallington, South London, BedZED comprises 100 homes, community facilities and workspace for 100 people

http://www.bioregional.com/programme_projects/ecohous_prog/bedzed/bedzed_hpg.htm

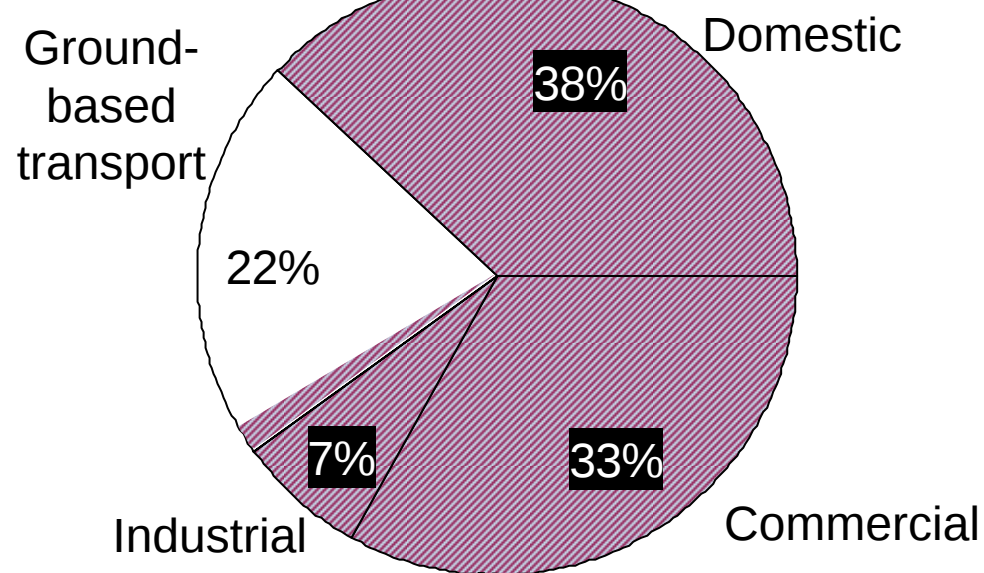
<http://www.zedfactory.com/background/background.html>

Key features of BedZED include: *South facing homes that maximise warmth from the sun *300mm insulation in external walls and roofs compared to *the standard 50mm *Triple-glazed windows to further reduce heat loss *A Combined Heat & Power plant that provides electricity *and hot water for BedZED. This is fuelled by woodchips *from waste timber that would otherwise be sent to *landfill *A *Living Machine:1 that recycles wastewater for use in *flushing toilets and irrigation *Wind cowls with heat exchangers on roofs to provide a *passive ventilation system *A green transport plan that promotes walking, cycling *and the use of good local public transport links. A car *club for residents is now fully established at BedZED *Photovoltaic panels that provide clean electricity to *power on-site as charging points for electric vehicles *Kitchens fitted with the latest energy saving appliances.

Where emissions come from: energy supply

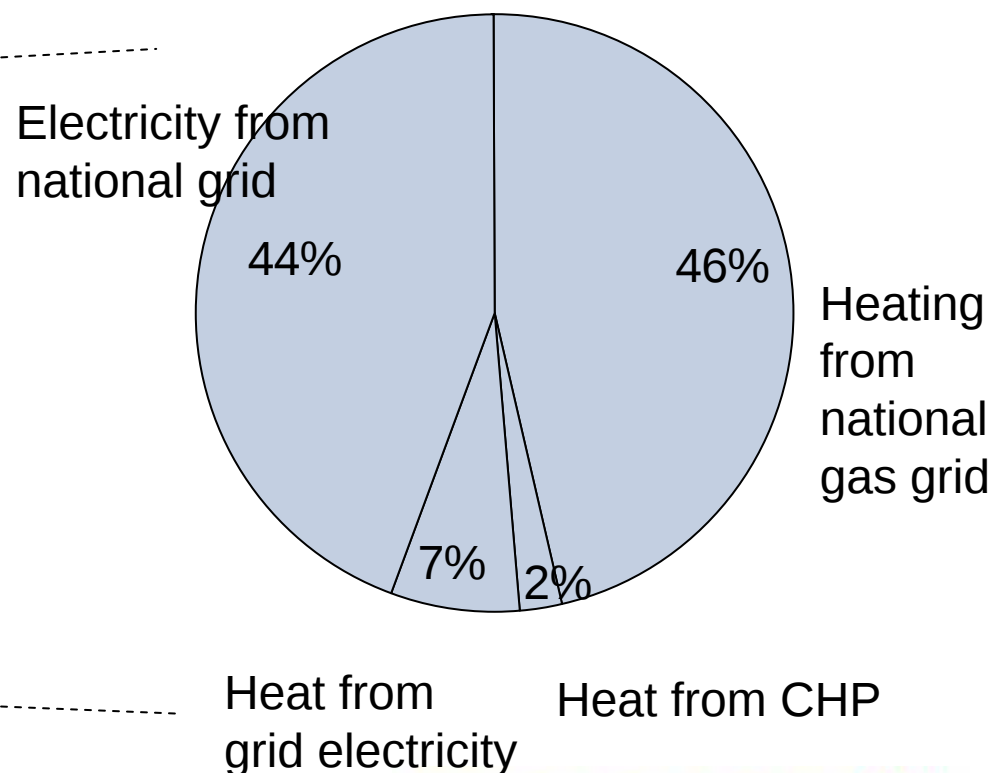
- 2006 emissions from all sectors, excluding aviation

- 100% = 44.3 million tonnes CO₂



- 2006 emissions from energy supply

- 100% = 34.7 million tonnes CO₂





25-35 percent of energy input used



85-95 per cent of energy input used



Cheaper and more efficient: decentralised energy

London Climate Change Agency

- The LCCA - development and implementation of energy efficiency, combined heat and power CHP (cogeneration/ trigeneration), renewable energy, fuel cells/hydrogen technologies and related transport, waste and water climate change projects:
- The creation of a centre of climate change and energy engineering excellence, offering advice and support to the GLA Group, the London Boroughs, other public bodies and the private sector.
- Public/private joint venture London Energy Services Company or ESCO, in partnership with one or more private sector partners (EDF), that will deliver low carbon decentralised energy solutions in new and existing development. Focus will be on cogeneration (combined heat and power), trigeneration (combined heat, power and cooling) and integrated renewable energy on local private wire district energy systems and networks.
- Other activities include large scale renewable energy, recycling/waste-to-energy technologies, stationary/transport hydrogen projects, sustainable water services systems (project or special purpose vehicle companies)

ESCO arrangements - Design, Finance, Build and Operate De-centralised Energy Systems

- LDA owns 100% of LCCA which owns 19% of ESCO. Other 81% owned by private company partner (EDF) through a subsidiary company (EDF Energy Projects) – initial funding LDA £235,000 and EDF £1million.
- Small Board of 6 Directors – primarily technical. 1 LCCA representative; 5 EDF representatives.
- Maintaining a ratio of less than 20% protects ESCO from application of regulated company status + structured as a commercial entity within EU rules involving no state aid. Subject to selection of mutually agreed suitable projects, LCCA Limited and EDF (Energy) Limited will purchase additional ordinary shares up to the following amounts: LCCA £938,000 and EDF £4,000,000
- The London ESCO about tackling market failure. Market competition is traditional grid licensed generators, distributors and suppliers providing conventional brown electricity and gas services. Private wire distributed generation district energy systems provide more competitive energy services due to inherent grid inefficiency and grid charges/levies that do not apply to distributed generation district energy systems. Island generation in the event of a power cut in the national grid affords local security of supply is also provided.

Using existing decentralised technologies/products – ITS NOT MAGIC to cut emissions e.g. Combined Heat and Power

Like a car engine – provides rotational power....but also lots of heat.

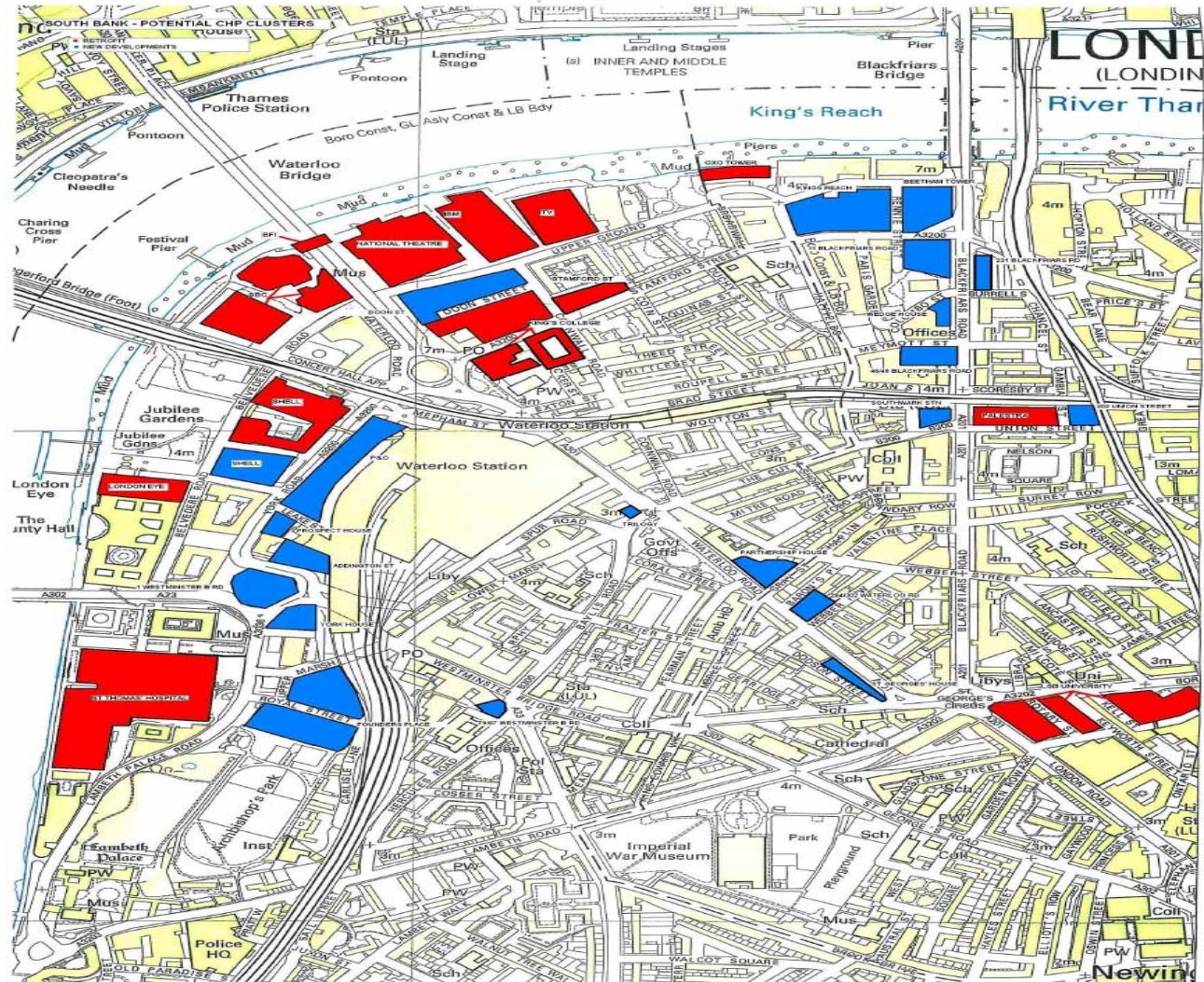
Electricity generated and used in building or sold to grid

Heat used in building or exported to a district heating network (and adapt for cooling buildings too)



SBEG (South Bank Employers Group) CHP Initiative

- One of 5 CHP schemes rolling out across London
- Proposed SBEG developments:
 - 2,000 hotel rooms
 - 3.28m ft sq offices
 - 30,000 ft sq retail
 - 1,800 dwellings
- 11 Existing loads, including:
 - Guy's, Shell building, IBM etc



Using existing technologies – solar thermal and solar tiles

Typical system comprises:

Collector

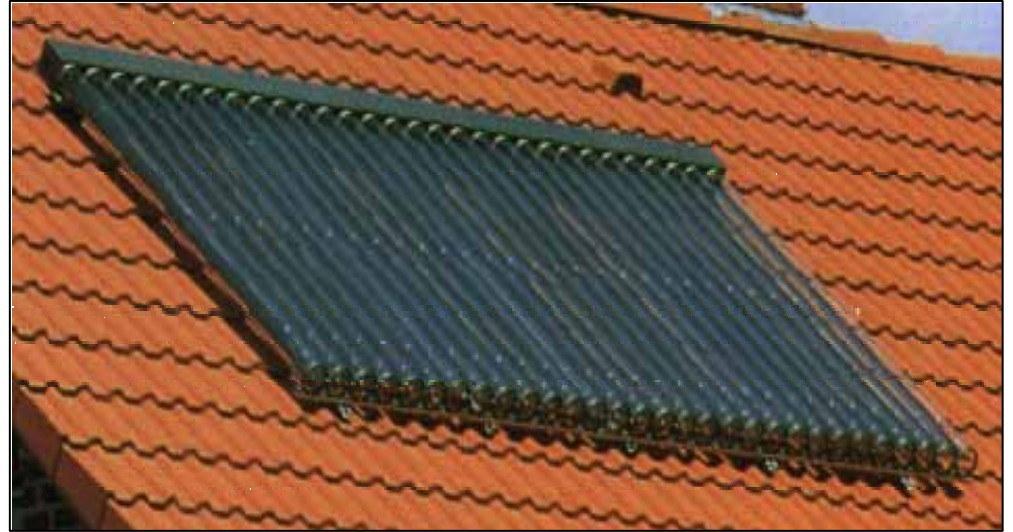
Fluid (water & antifreeze)

Heat exchanger

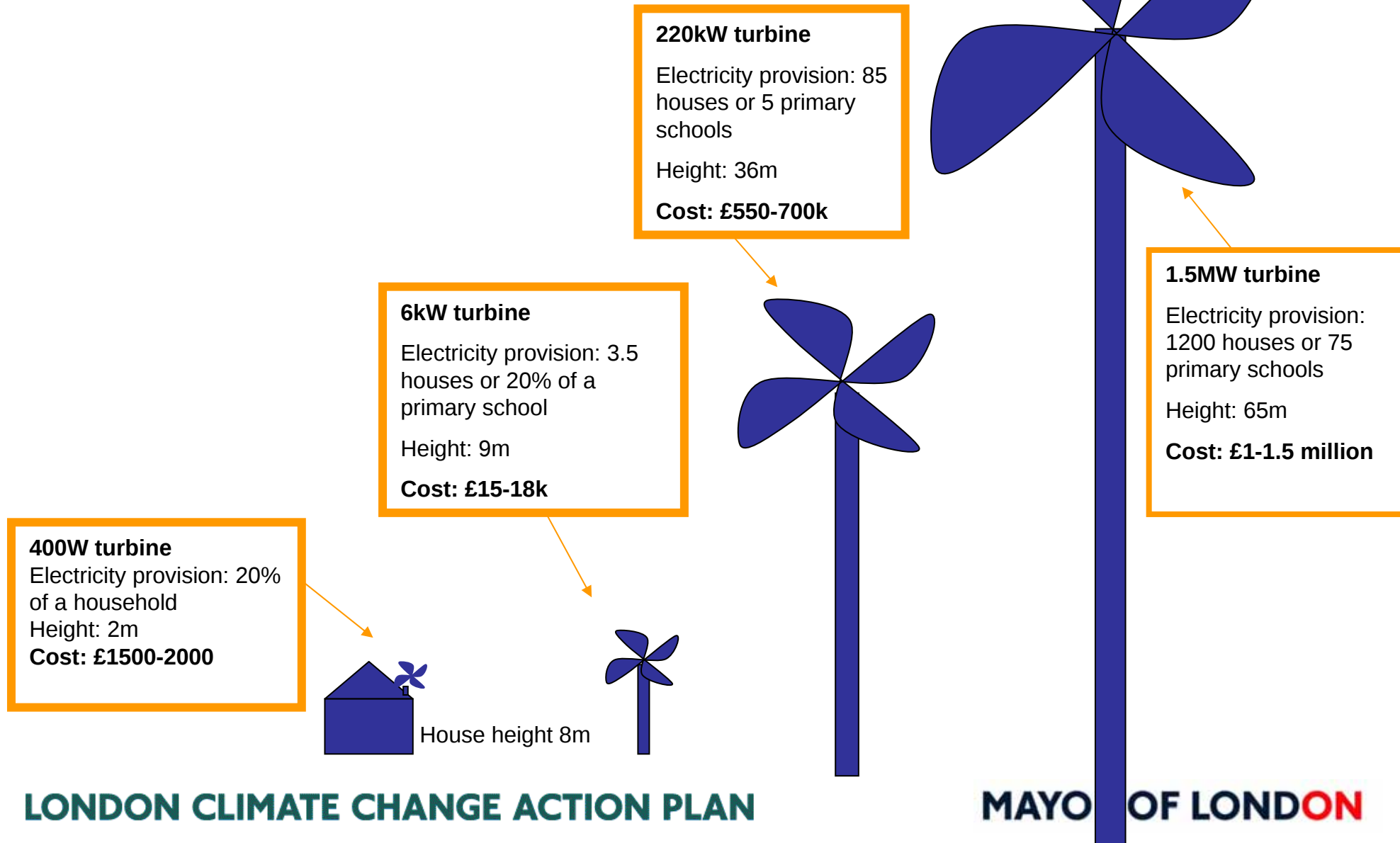
Control system (temperature sensor & pump)

Will provide around 50% of year round DHW – no power or space heating

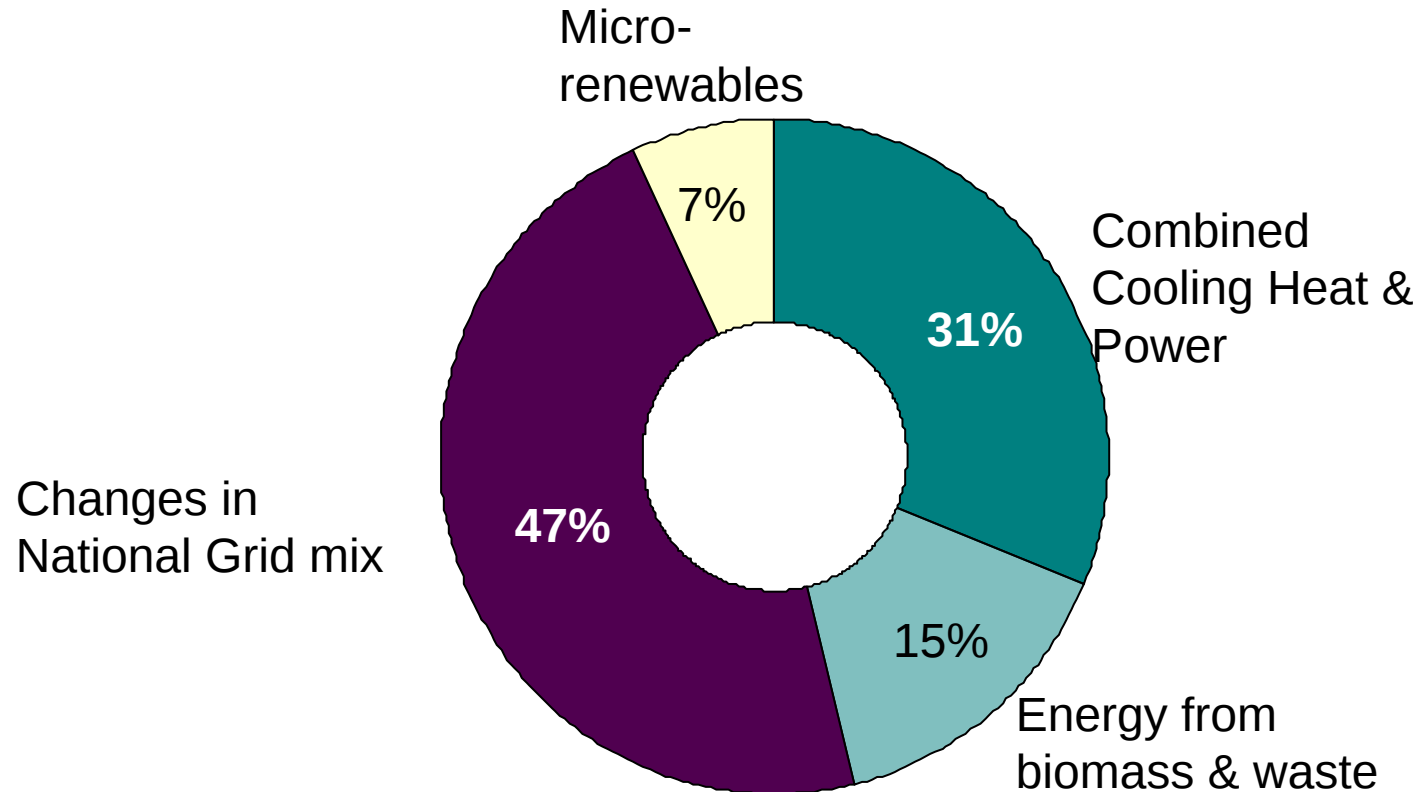
Domestic installation - £3,500



Wind – it works

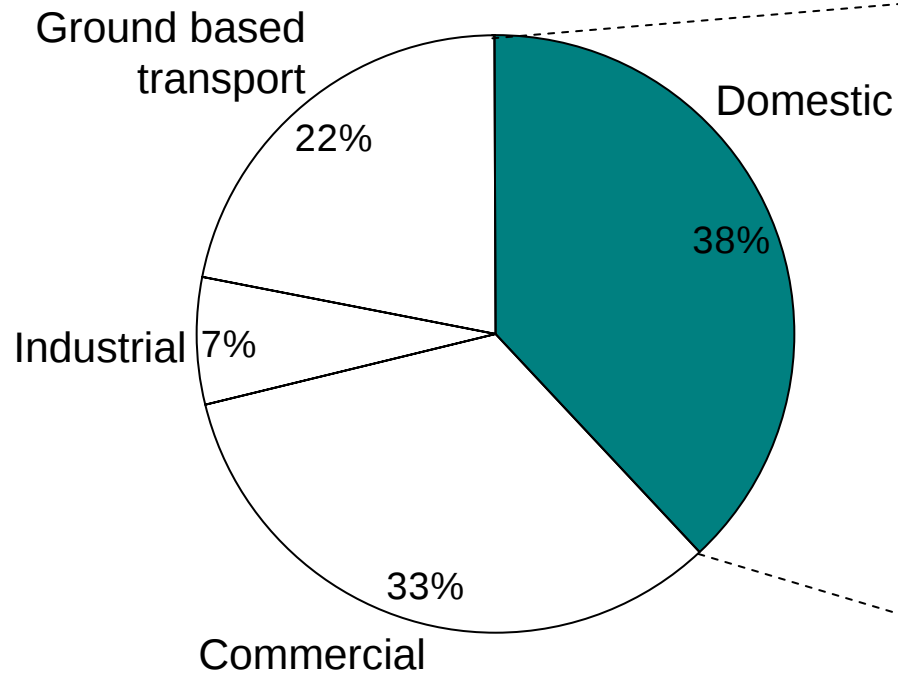


Sources of savings from energy supply

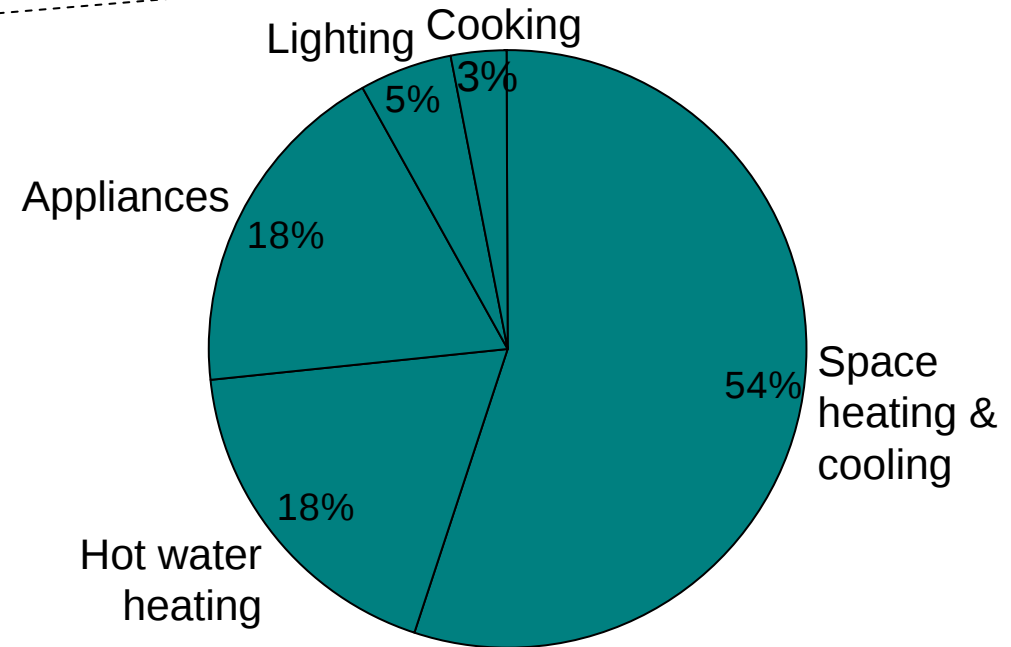


London's CO₂ emissions from domestic sector 2006

- All sectors, excluding aviation
- 44 million tonnes CO₂



- Domestic sector
- 17 million tonnes CO₂



The art of the possible – exemplar developments

Gallions Park – LDA first '0' carbon estate

Gallions Park ESCo Solution

- Up to 250 new homes proposed.
- Code for sustainable homes level 4 overall, but level 5 for energy.
- Buildings to have a thermal mass of 19, therefore they are warm in winter and cool in summer.
- The development incorporates a biomass CHP boiler, providing energy and power on-site.



Home insulation campaign

SAVE! FROM ONLY £250 HOME INSULATION

GET CAVITY WALL INSULATION FROM ONLY £250 AND FULLY FITTED LOFT INSULATION FOR AS LITTLE AS £274...

SAVE! £100 HUNDRED

£300 CASHBACK FROM THE MAYOR OF LONDON AND BRITISH GAS. EASY TO SAVE UP TO 60% OFF YOUR HEATING BILL...

SAVE! AND HELP STOP CLIMATE CHANGE BY HELPING TO SAVE OVER 700,000 TONNES OF CO₂.

CALL 0845 070 5059

British Gas MAYOR OF LONDON

DIY CLIMATE

FREE! FREE INSULATION HOME INSULATION

IF YOU ARE IN RECEIPT OF BENEFITS, YOU COULD GET FREE CAVITY WALL AND LOFT INSULATION...

SAVE! £100 HUNDRED

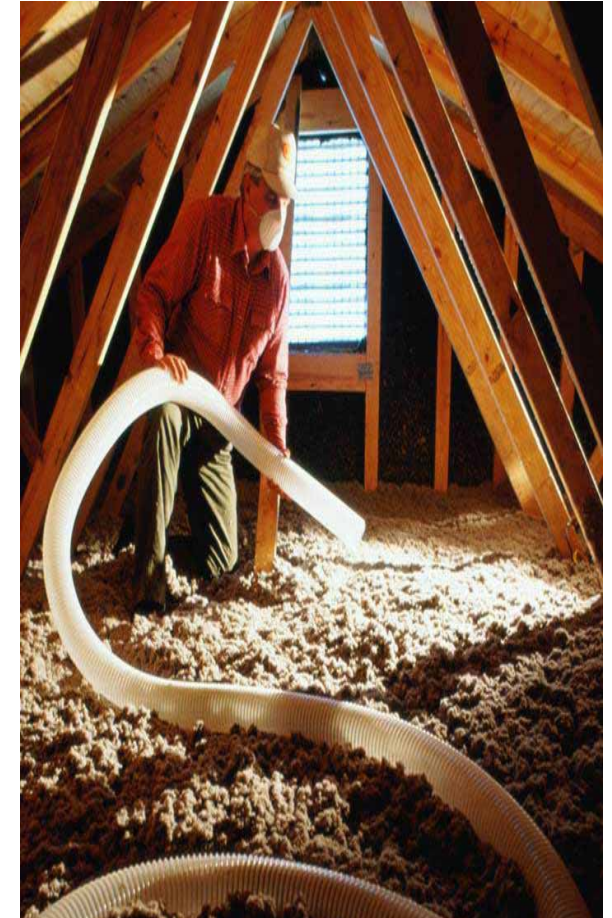
INSTALLING INSULATION WILL REDUCE YOUR HOME'S ENERGY BILL...

HELP! AND HELP STOP CLIMATE CHANGE BY HELPING TO SAVE OVER 700,000 TONNES OF CO₂.

CALL 0845 070 5059

British Gas MAYOR OF LONDON

DIY CLIMATE



LONDON CLIMATE CHANGE ACTION PLAN

MAYOR OF LONDON

London incentives - cut price and FREE home energy services

- **Cut price loft and wall insulation (1 year payback)**
- **Available to every home that can benefit across London**
- **Free to those on benefits and targeting pensioner households**
- **Partnering with Faith, Charity and Community groups (diverse London and global village outreach)**

Real world financial gains NOW

Taken together, these measures will save
the average London household around

£300 each year off energy bills

Rainwater recycling and saving water





London homes produce 40% of the city's carbon dioxide (CO2) emissions - which contribute to climate change.

The Green Homes website contains information, help and advice for homeowners, tenants and landlords on simple green practices that will help reduce the city's CO2 emissions and achieve the bold targets from the Climate Change Action Plan.

It's time to make changes in London now. The Green Homes website from the London Development Agency can help.

ENERGY MAKEOVER TV



Watch 'through the keyhole' videos of London homeowners who have signed up for an energy makeover with the Green Homes Concierge Service.



GREEN CONCIERGE SERVICE

Find out how our Green Homes Concierge Service staff could cut your energy consumption, reduce your emissions and slash your utility bills.

WELCOME TO NO.1 LOWER CARBON DRIVE



Discover some of the products, technologies and habits that you can adopt at home to tackle climate change.

What's in this website for me?

For Homeowners

Making positive changes to your home could reduce your impact on the environment - and increase the value of your home.

For Landlords

Help your tenants save money and increase interest in your property with just a few cost effective measures.

For Tenants

There are lots of low cost and low impact measures you can take to make a difference - and reduce your utility bills.

REAL LIFE STORIES

Find out how other Londoners are tackling climate change in their home.

MORE FROM LONDON DEVELOPMENT AGENCY (LDA)

DIY Planet Repairs website

DIY Planet Repairs aims to provide you with practical advice and useful information to help you make simple and effective 'green' changes.



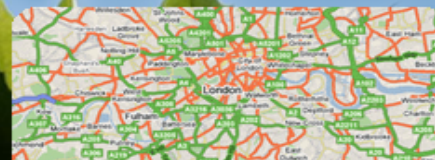
HOW GREEN AM I?

Do you know how much CO2 you're



HELP & ADVICE

The London home is one of the biggest



PROMISE TO BE GREENER

Why not stand up and be counted

A One Stop Shop – The Green Homes Service programme

GREEN HOMES PROGRAMME

£7m next year

1 INCREASE AWARENESS

- Not aware how their homes contribute to CO₂, or that they can do anything about it

1. Marketing and behavioural change campaigns (all consumer segments)

2 PROVIDE INFORMATION

- Not sure what they should do about it, or who they should get to help them with it

2. Advice service (all consumer segments)

- Web portal
- Phone
- Face to Face counters (IKEA partner?)
- Promotions with private sector

3 EXECUTE/ DEVELOP THE SUPPLY CHAIN

- Can't overcome the inertia/hassle factor, don't have the funds, inadequate supply of skilled tradesman to perform the work

3. Concierge service (owner occupiers, able-to-pay)

4. Social housing and fuel poor programme (non able to pay/fuel poor)

5. Skills training (all sectors)

6. House Purchase and refurbishment initiative (owner occupier, able to pay)

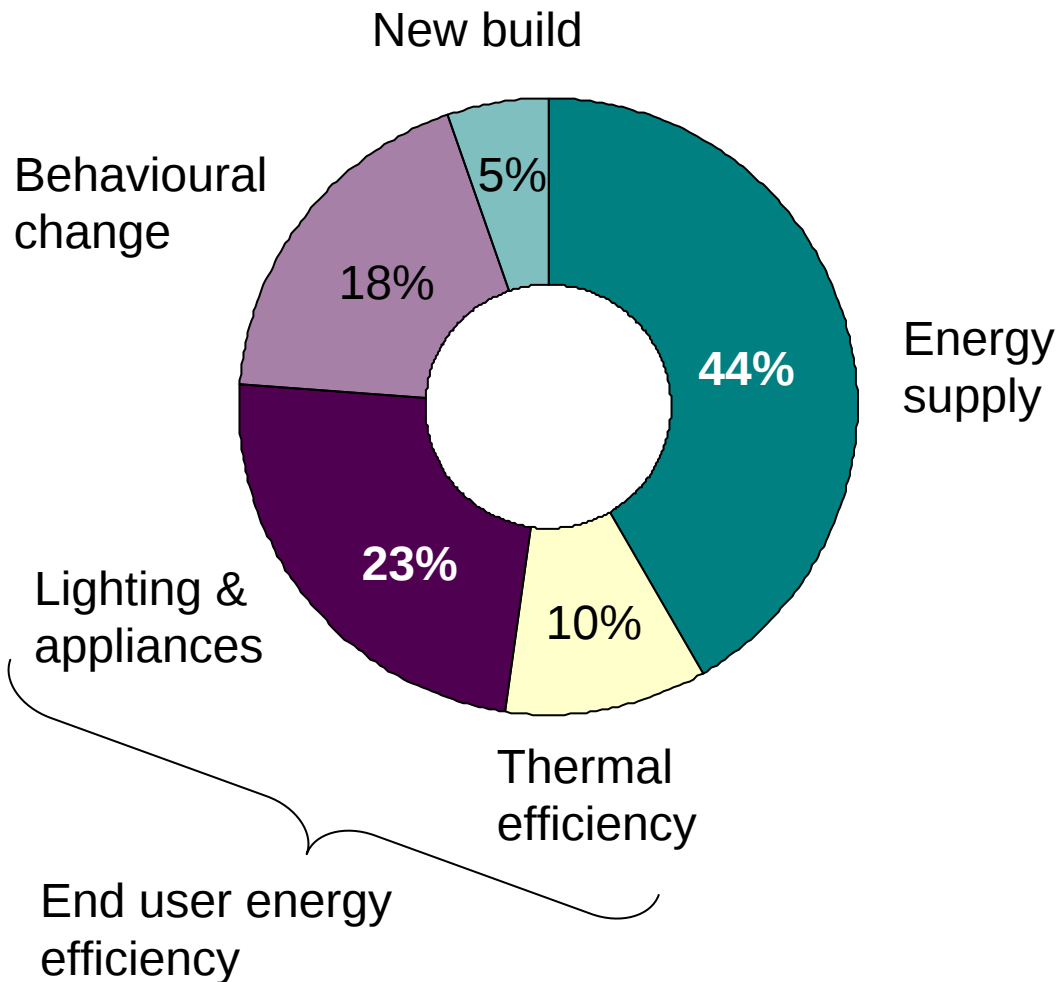
7. Green Landlord initiative (privately rented)

8. Influencing government (lobbying programme)

Issue

Initiative

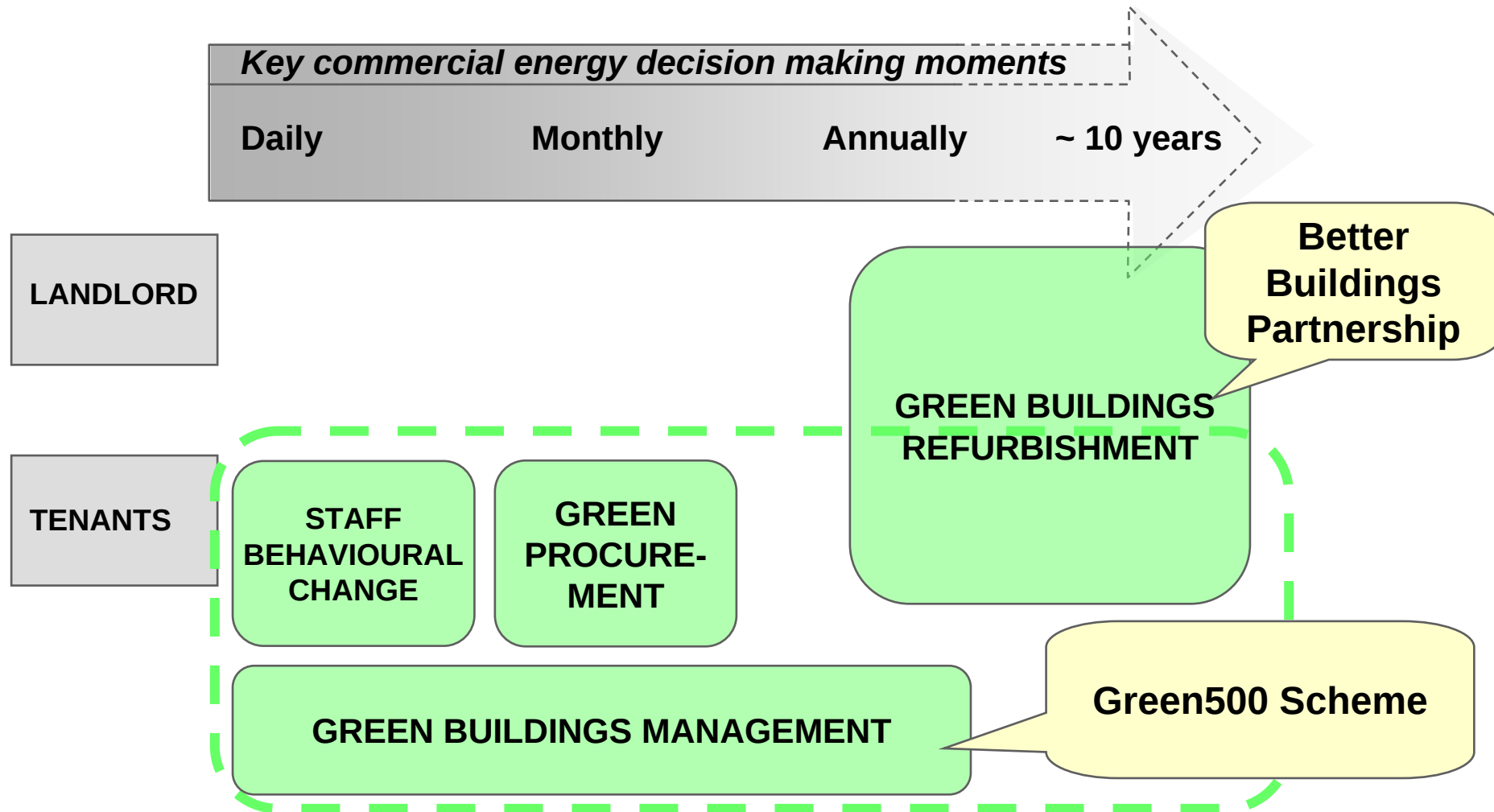
Sources of carbon dioxide savings from existing homes



London Energy Action Areas

- The London Energy Partnership set up and deliver the Mayor's Energy Action Areas as exemplar showcase low carbon developments in London. Huge interest from developers and local authorities that have put themselves forward as pilot Energy Action Areas (EAAs).
- Four pilot areas are Merton, Barking, New Wembley, and a joint proposal from Southwark of the Elephant & Castle regeneration area and the Southwark concerto community. Funding and support for the pilot EAAs programme secured through the London Energy Partnership. Deliver carbon savings ranging from 40 per cent - 60 per cent; Southwark aims to achieve carbon savings in excess of 60 per cent by 2010.
- Energy Action Areas (EAAs) are a discrete neighbourhood or regeneration area, so many elements of the Mayor's Energy Strategy can be brought into operation simultaneously. The Mayor has proposed Energy Action Areas as a mechanism to enable major sustainable energy projects to get implemented and tackle range of energy issues (fuel poverty; green jobs; carbon reduction).
- Showcase of how Energy Strategy could be applied and replicated more widely, to demonstrate integration opportunities between sustainable energy technologies and specific built environments, e.g. a new build housing development powered by a community network of biomass CHP. Some elements will be common across each EAA - e.g. use of local heat distribution networks, CCHP, renewable technologies, carbon reduction and green procurement processes - each expected to demonstrate unique characteristics in terms of technical, financial and partnership approaches.
- Examples include the collection of organic waste from 10,000 households in the Southwark concerto community to be treated through anaerobic digestion and distributed back to the same households through a biogas CHP community heating network. Through demonstrating holistic approach to sustainable energy delivery and waste reduction, anticipated that other developments will learn and replicate the process.
- [Energy Action Areas information leaflet PDF](#)
[Energy Action Areas information leaflet RTF](#)

Green organisations/business programmes



LONDON
LEADING TO A GREEN LONDON

GREEN
ORGANISATIONS

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Enter keywords

Search

The message for all organisations is clear: it's crucial that we take action now to tackle climate change. London's response to the climate challenge has been to champion significant and immediate action.

London Green Organisations is the Mayor's premiere business facing initiative.

This website incorporates the new services, information and advice, tools and case studies that the Green Organisations programme offers - demonstrating how organisations like yours - can really make a difference.

It's time to make changes in London now. The Green Organisations website can help.

WELCOME TO NO.1 LOWER CARBON DRIVE



Discover some of the products, technologies and habits that you can adopt to tackle climate change.

INFORMATION & ADVICE



NATURAL HISTORY MUSEUM

Find out how the Natural History Museum is going to save over 2,000 tonnes of CO2 emissions per year.



BENEFITS OF BEING GREEN FOR SMES

Read how SMEs can put themselves ahead of competitors, increase profits and reduce costs by adopting green measures.

What's in this website for me?

For Small/Medium Organisations

Green Organisations supports London SMEs looking to take action on climate change and adopt greener practices to identify services designed to help.

For Large Organisations

Find out how the London Development Agency's Green Organisations programme can help large businesses reduce their carbon footprint.

LONDON CLIMATE CHANGE AGENCY

The London Climate Change Agency has been set up by the Mayor to help reduce carbon dioxide emissions from London. It is a commercial company wholly owned, controlled by and housed in the London Development Agency. The work of the LCCA is a key part of the Mayor's commitment to making London a sustainable world city.



BUILDING & ENERGY SAVING TOOL

Assess your organisation's carbon



GREEN 500

Uniting, encouraging, nurturing, acknowledging and celebrating



BETTER BUILDINGS PARTNERSHIP

An exclusive collaboration between

Better Buildings Partnership

- **Exclusive collaboration of London's major commercial property owners, and allied organisations - working together to remove barriers to improve sustainability of commercial properties**
- **Led by London Climate Change Agency**
- **The 3 priority issues that the BBP will tackle are:**
 1. **green leases**
 2. **valuation of sustainable buildings**
 3. **standard terms for managing agents/letting agents**

Green500

Aims

- To encourage, nurture, acknowledge and celebrate organisations in London that commit to putting green practices into action and help achieve London's target of a 60% reduction in CO2 by 2025.
- aimed at organisations that already lead and influence others and those that have potential to reduce CO2 emissions.

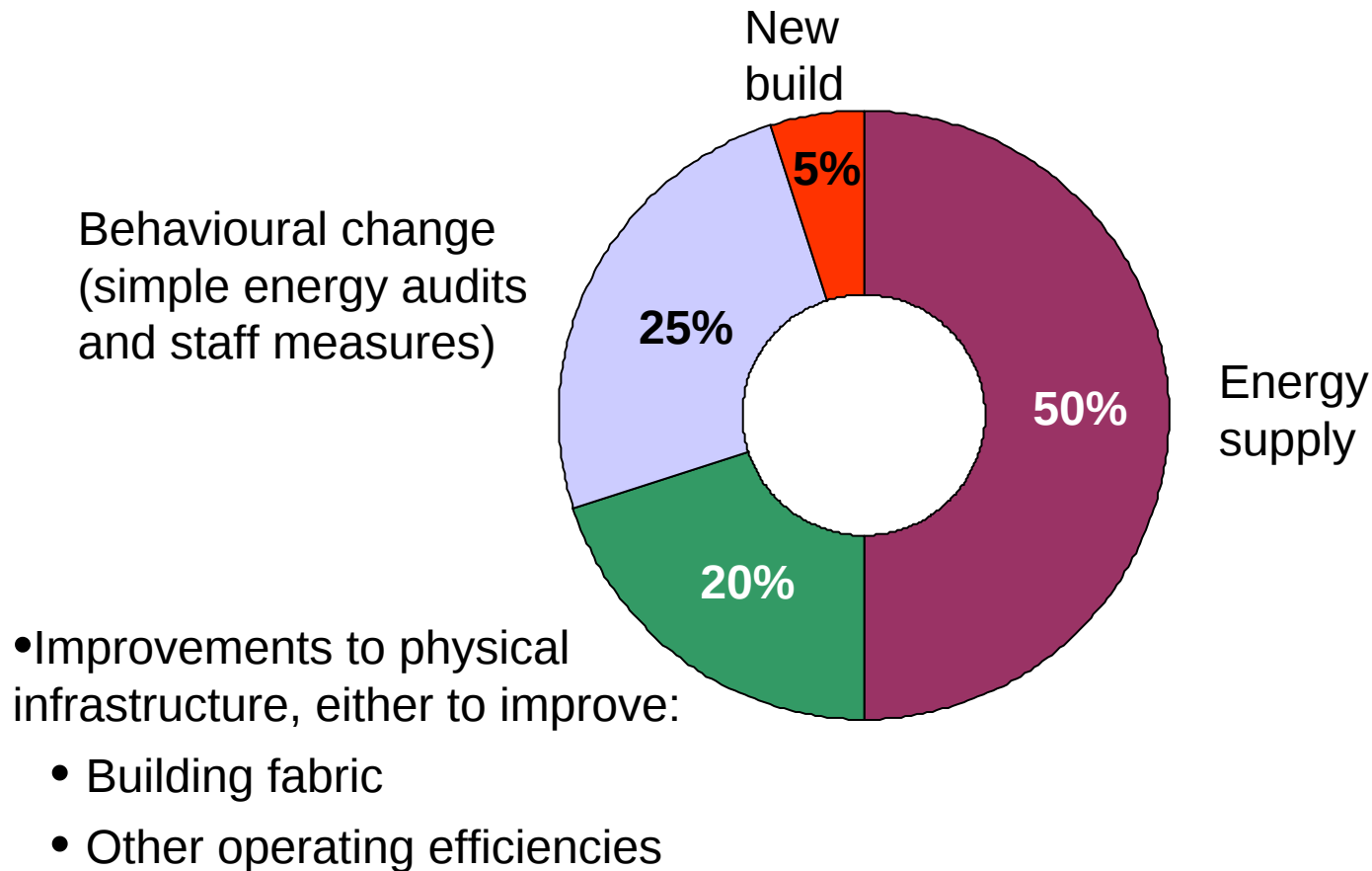
Structure

- Combination of carbon management service and a performance based awards scheme

Outcomes

- Annual Green500 Award presented by the Mayor

Sources of savings in the commercial and public sector

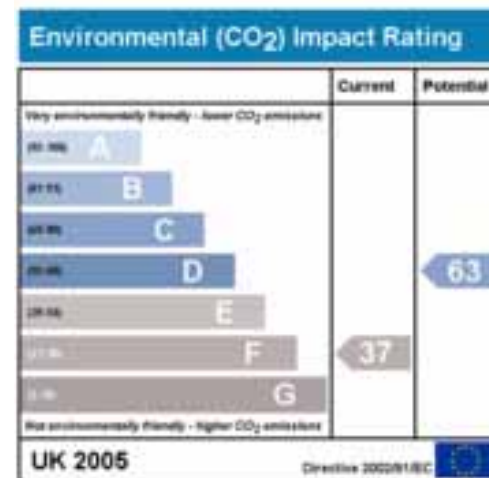
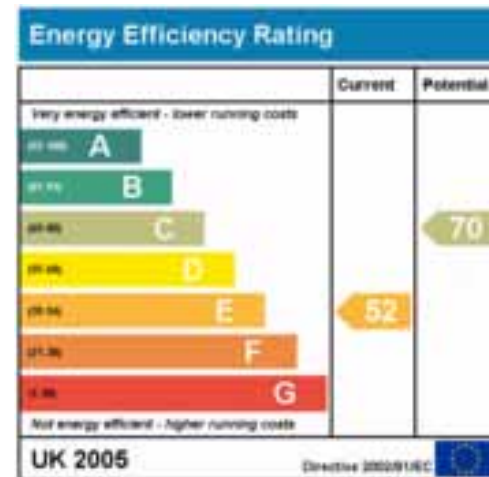


International cooperation vital - the C 40 group (Large Cities Climate Change Initiative)

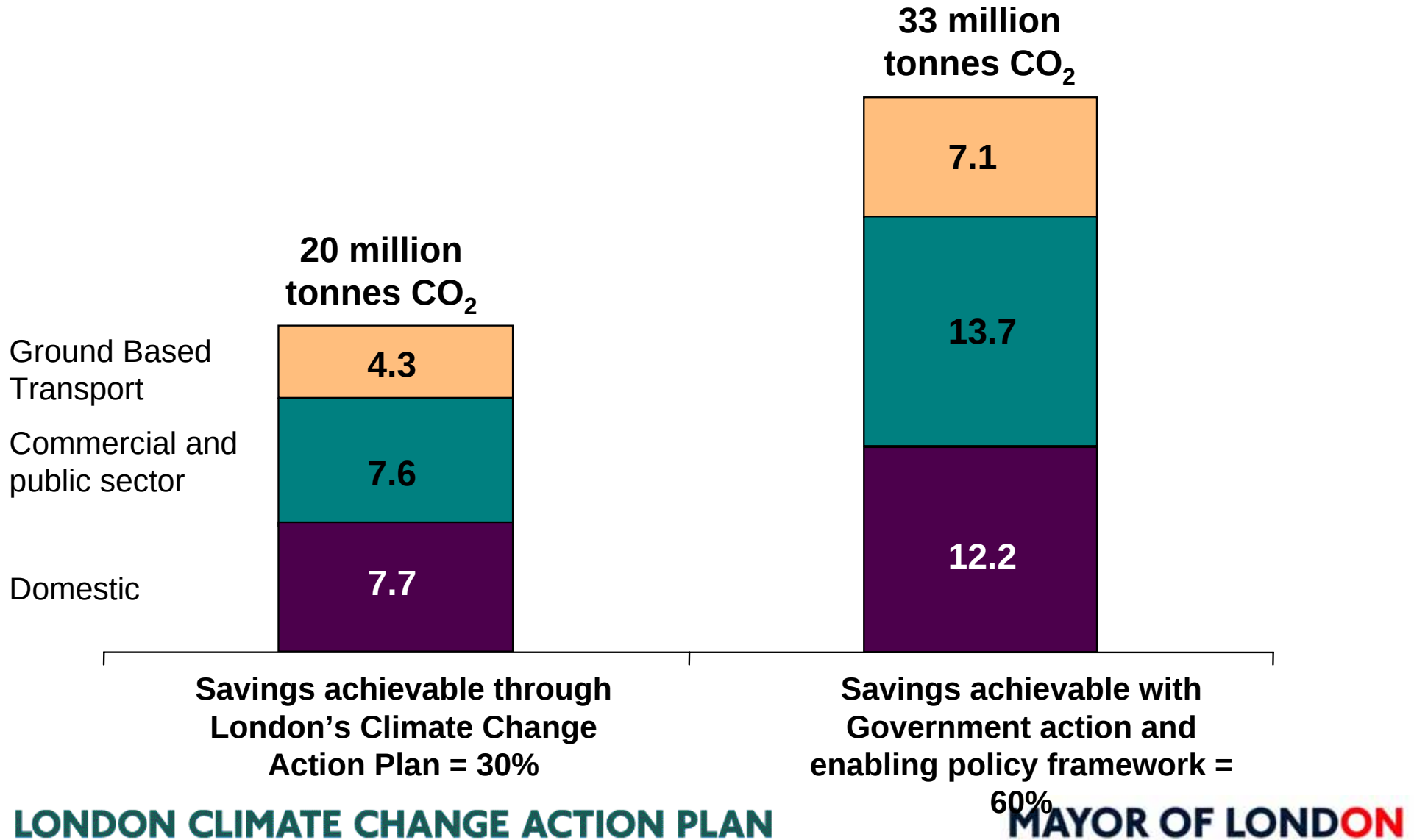
- **Building on the first Large Cities Climate Summit initiated and hosted by the Mayor of London in October 2005, the C40 cities met in New York, from 14-17 May 2007. The cities recognize the need for action and cooperation on reducing greenhouse gas emissions and pledged to work together.**
- **Public procurement – 16 cities – energy efficiency in all public buildings – schools, hospitals, government offices – huge boost to market – 5 biggest banks pledged \$5 Billion in loans and 8 biggest electrical product manufacturers guaranteed to boost production and lower prices – huge boost – and everyone will benefit from lower prices ...**

Central Government's role

- Carbon pricing
- Carbon performance standards –
 - Building Regulations tightening
 - Code for Sustainable Buildings
 - Energy Performance of Buildings Directive
- Regulatory change to encourage decentralised energy
- More rapid shift to renewable power
- Climate Change Bill + legal reduction targets – a global first



Sources of annual reductions by 2025



Summary 1: Sources of 60% CO₂ reductions by 2025

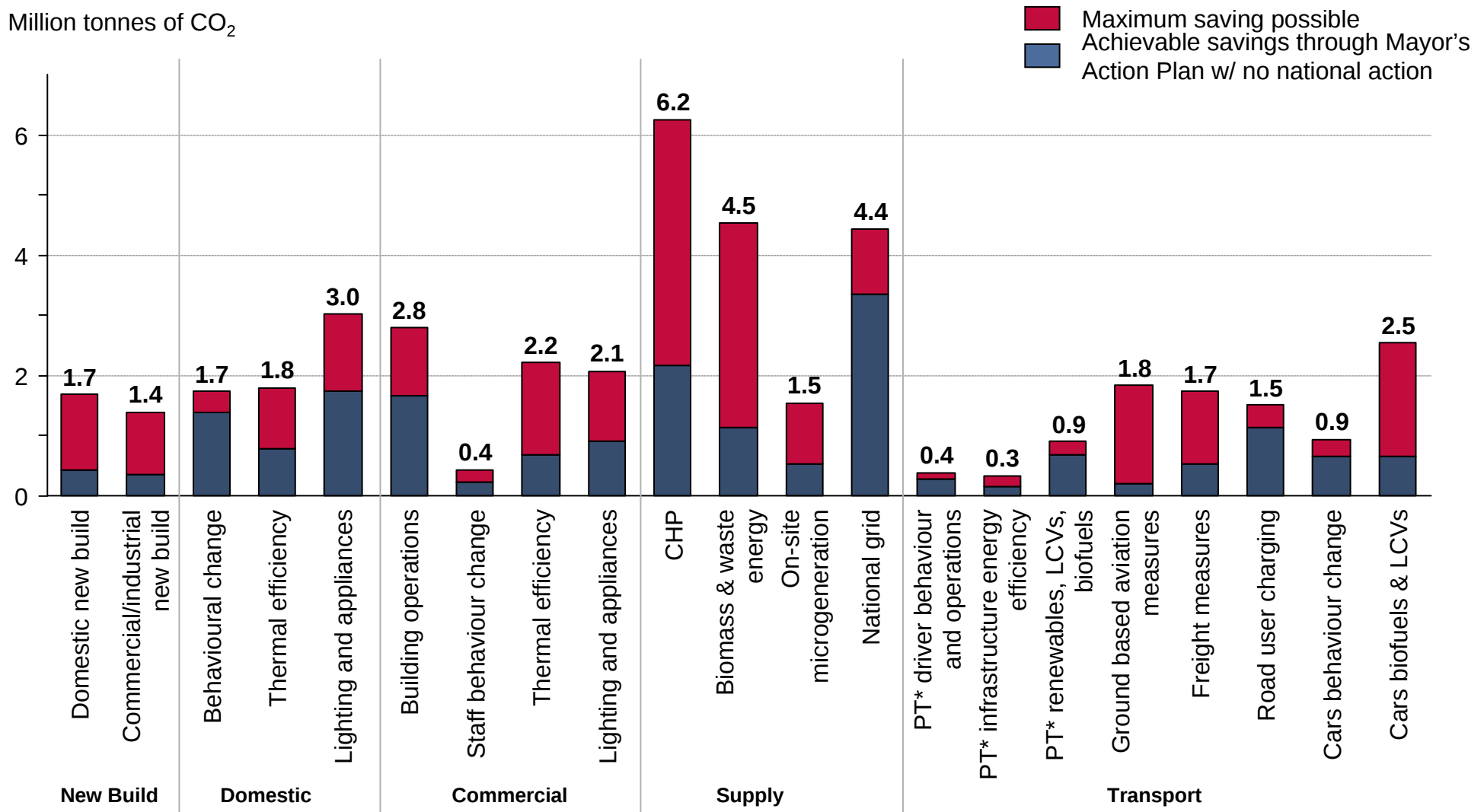
PRELIMINARY NUMBERS

Contribution to overall reduction

•Existing homes	13%
•Existing commercial activity	15%
•New build	8%
•London's energy supply	30%
•National energy supply	15%
•Transport	19%

Summary 2: overall CO₂ savings by sector and measure

Million tonnes of CO₂



* Public transport, i.e., underground, buses & coaches, national rail

Summary 3: Need for government action – new national policy framework to meet 60% cut

- **Carbon pricing (mandatory cap-and-trade emissions market, including air travel; carbon tax)**
- **Regulatory and fiscal change to encourage and incentivise decentralised energy/waste networks (CCHP + bio-gas from waste streams)**
- **Incentives and penalties – polluter pays taxation + hypothecation**
- **Planning and policy support for rapid shift to renewable power (wind, wave, tidal, solar) and energy efficiencies**
- **Statutory reduction targets, based on best science**
- **Trade-able national and personal carbon allowances**

Summary 4: Imperatives to successfully change carbon-heavy behaviours

- 1. Long-term strategy with best science targets and policy drivers to transform markets to value zero/low carbon**
- 2. Enabling policy framework of 'carrots and sticks' for companies and citizens**
- 3. Cheaper, more convenient and integrated low carbon solutions**
- 4. Exemplar zero-low carbon/waste developments and projects**
- 5. Comprehensive information, advice and audit programmes for households and companies**
- 6. Verifiable, coordinated and effective international action**
- 7. Partnerships between sectors – public, private, domestic, voluntary**
- 8. Integrated changes across economic sectors – especially financial, energy, transport, waste, buildings**
- 9. Leadership – political, professional, personal.**