

3 the vision and objectives for energy in London

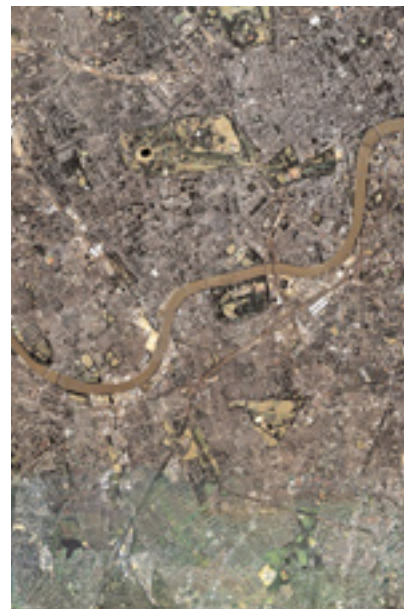
An energy vision for London

- 3.1 The Mayor's vision is to develop London as an exemplary sustainable world city. To help move London towards this long-term goal, the Mayor has developed a more detailed energy vision.
- 3.2 The 2050 energy vision for London presented in the box below aims to illustrate how the current potential for technological, institutional, economic and social change could come together to create a sustainable energy system. It portrays a climate-friendly system, delivering the carbon dioxide (CO₂) reductions to stabilise global atmospheric CO₂ under the contraction and convergence approach (such as the 60 per cent reduction by 2050 which the Government has accepted). It provides quality energy services with significant economic and social benefits, in which fuel poverty has long since vanished. It acts as a long-term goal for the Mayor's Energy Strategy and helps to guide us towards a future of sustainable energy.
- 3.3 The majority of the technologies on which this vision is based are already available to the market place, or could be brought about through further development and investment in the coming decades. They also constitute the main solutions advocated by key energy reports such as the Royal Commission on Environmental Pollution's report, Energy - The Changing Climate¹, and the Performance and Innovation Unit's Energy Review². See Box 1 for a summary of the Energy White Paper and Chapter 4 for an explanation of contraction and convergence as an international approach to addressing climate change. The EC High Level Group on Hydrogen's recently published vision³ was also considered in producing the Mayor's vision.
- 3.4 Achieving sustainable energy means more than simply changing the energy sources of our energy system - it requires a total change in the way the overall system operates. In the long term we can change every aspect of our energy infrastructure, ranging from the structure of the electricity distribution system to the efficiency of electrical appliances. Through improving the delivery of our energy services, we can change the demands on our energy inputs.

Box 1: A 2050 Energy Vision for London

Overview

It is 2050 and London has a radically different energy system from the one that characterised the 20th century - it is a high performance system powered by renewable energy and a reduced fossil fuel input which has delivered carbon dioxide (CO₂) emission reductions of more than 60 per cent relative to those of 2000⁴.



Organisations and residents have an understanding of environmental issues and the effects of their actions. They play a key role in increasing the sustainability of their city.

Sustainable energy use

Radical improvements in energy production have resulted in highly sophisticated use of energy in all applications across all sectors. This is characterised by:

- a high performance building stock (brought about by highly efficient new buildings and retrofitting of existing buildings)
- highly efficient electrical appliances
- widespread use of computer control systems to manage both energy demand and small- scale generation (in homes and business)
- a shift to walking, cycling, public transport and greater use of super-efficient, quiet, pollution-free, fuel cell vehicles
- companies which provide all energy services to domestic and commercial customers. They manage and control all electricity and heat production and procurement at the local (on-site) level. This focuses management attention on the performance of energy services so that efficiency is maximised and customers receive high-quality services at minimum cost
- widespread improvements in the performance and effectiveness of energy-using equipment. As a result, the quality, or quantity, of energy services has been improved while the quantity of fuel or electricity consumed has declined.

Sustainable energy provision

The development of decentralised electricity generation has delivered huge fuel productivity benefits by enabling the convergence of heat and power generation, as well as leading to massive growth in renewable energy production. This is characterised by:

- dynamic local electricity networks with large numbers of micro-generators
- combined heat and power operating at the domestic and community level, in business and industry
- extensive renewable energy generation in London and imported renewable energy
- fuel cells have become the dominant technology in transport, heat and power, increasing the efficiency of fossil fuel use owing to their high energy conversion efficiency, and complementing the production of renewable energy. This decentralised energy system constitutes the emergence of a full hydrogen-oriented economy.

Sustainable economy

The new economy focuses primarily on service provision rather than continuously increasing the production and supply of material goods. This has reduced waste, increased product lifespan and reduced the quantity of materials flowing through the London and UK economy - which in turn has reduced the amount of embodied energy that is consumed in the manufacture and transport of these materials and waste.

Policy context

The market place, and governance and institutional structures, of the 2050 energy system have changed and developed substantially since the 20th century. This has included:

- effective leadership and co-ordination of sustainable energy policy in London and the UK as a whole
- fiscal reform, which has shifted the balance of tax onto the use of non-renewable resources, including energy
- a whole raft of legislative measures prioritising energy productivity in buildings, electrical appliances, vehicles and industrial equipment
- As a result, the power of the market has been focused onto energy productivity and decentralised power, and
- effective partnership working between the many different elements and organisations comprising the London energy system.

The development of the green economy has created a competitive edge for London and the UK as a whole, which has contributed to the prosperity of the British economy.

Aims and objectives of the Energy Strategy

- 3.5 This strategy sets out how London can develop as an exemplary world-class city for sustainable energy, and begin to move towards the long-term vision presented here. It concentrates on the period up to 2010 and beyond. It has the following aim and objectives:

To minimise the effect of London's energy production and use on health, and the local and global environment, improve social equity, and economic performance. In particular:

- **to reduce London's contribution to climate change by minimising emissions of carbon dioxide from all sectors (commercial, domestic, industrial and transport) through energy efficiency, combined heat and power, renewable energy and hydrogen**
- **to help eradicate fuel poverty, by giving Londoners, particularly**

- **the most vulnerable groups, access to affordable warmth,**
- **to contribute to London's economy by increasing job opportunities, by innovation in delivering sustainable energy and by improving London's housing and other building stock.**

The Mayor's Energy Hierarchy

- 3.6 Changes to the various components of the energy supply system will affect its overall social, environmental and economic performance. By making the most effective series of changes, we can ensure that we work to deliver optimal improvements, in terms of reduced CO₂ emissions, and increased energy and economic efficiency.
- 3.7 Energy is fundamental to urban activity and adequate provision is a priority. Increasing the efficiency of energy use is often the most cost-effective way to reduce CO₂ emissions, as it reduces the consumption of primary resources. It also reduces the dependence on imports and the associated risks, improving security of supply and the balance of trade. Energy efficiency at the household level lessens the likelihood of fuel poverty, makes homes more comfortable, and cuts heating costs. Renewable energy can contribute to meeting our remaining energy demand without causing CO₂ emissions.
- 3.8 The Mayor proposes to adopt the following Energy Hierarchy. This is a set of principles to guide decisions on energy, while optimising environmental and economic benefits. The three principles outlined below would ideally be applied in sequence, and be considered alongside other factors, such as economic and social costs and benefits, and potential future options.

Meet essential energy needs

1. Use less energy

'Be Lean'



- Reduce consumption through behaviour change
- Improve insulation
- Incorporate passive heating and cooling
- Install energy efficient lighting and appliances

2. Use renewable energy

'Be Green'



- On site: install renewable energy technologies, such as solar water heating, photovoltaics, biomass, wind turbines
- Off site: Import renewable energy generated elsewhere

3. Supply energy efficiently

'Be Clean'



- Use combined heat and power, and community heating
- Cut transmission losses through local generation

- 3.9 A combination of using less energy and using more renewable energy supply is the only sustainable way to reduce our dependence on fossil fuels. They should therefore always be considered first.
- 3.10 Reducing energy demand keeps the size, cost and environmental impact of the whole energy system to a minimum. It then becomes possible to supply a greater proportion of the remaining demand from renewables, thereby minimising CO₂ emissions. In cases where the additional cost of renewable energy is prohibitive, it is essential to maximise the efficiency with which fossil fuels are used. This is the logic of the hierarchy, as it ensures that energy needs are met in the most efficient way.
- 3.11 The hierarchy is flexible, and can be adapted to many applications by a range of users. For example, it could support the work of architects, developers, clients of developers, boroughs in development control, and building and transport managers. It can also be applied to the behaviour of individuals, for example in the home.
- 3.12 Examples have been provided in terms of energy for buildings. However, the hierarchy could also be applied to transport. 'Lean' transport could include working from home, video conferencing, walking to the shops, and using local facilities. 'Green' transport could be cycling. 'Clean' transport would be the use of public transport and vehicles that are more fuel efficient. There are also air quality and congestion benefits to the options at the top of such a hierarchy.
- 3.13 The Hierarchy is intended to guide decisions in individual situations and should reduce the energy that would otherwise have been used in that situation. However, while Londonwide CO₂ emissions should fall, predicted population growth means that total energy use is still expected to increase.
- 3.14 The Mayor's proposals to support the Energy Hierarchy approach, and to help overcome barriers to it, are presented in later sections of this strategy.



Delivering the objectives

- 3.15 There are three principal approaches to implementing the Energy Strategy:
- 1. The Mayor setting targets for London** (Chapter 4)
 - 2. The Mayor using his own powers** (Chapters 5 and 6)
 - 3. The Mayor and London working in partnership** (Chapter 7)
- 3.16 The Mayor will take a lead in setting targets for London, as part of a strategic framework for action for all who live and work in the capital.





Targets provide a clear and simple means of setting out the direction of change and need to be challenging, yet achievable. They can provide a benchmark for measuring performance and the extent to which the objectives of the strategy are being met.

3.17 The Mayor will use his own power to contribute to meeting the Londonwide targets in the following ways:

- 1. The Mayor's planning powers.** The London Plan (the Spatial Development Strategy) sets the overall planning policies for London and influences the content of borough Unitary Development Plans. Furthermore, the Mayor makes decisions about specific strategic planning applications.
- 2. The London Development Agency.** The London Development Agency (LDA), part of the GLA group, has the task of promoting a more balanced and sustainable economic structure for London. It has significant resources for taking effective action on the variety of issues that this overall task implies. One of these issues is energy, and in particular the need to promote the renewable energy and energy efficiency sectors of London's economy.
- 3. Transport for London.** Transport for London (TfL), part of the GLA group, has wide-ranging responsibilities for the transport system. This is an important sector of London in terms of quantity of energy consumed. The Mayor intends to use his powers in relation to TfL to integrate the objectives of this Energy Strategy into TfL operations and policy.
- 4. Leading by example.** The Mayor will apply and deliver the strategy's policies through his services and activities, and those of the GLA group (TfL, LDA, the Metropolitan Police Authority, and the London Fire and Emergency Planning Authority).
- 5. Providing information on energy in London.** To make progress, it is critical to know how London uses and sources its energy. This is a fundamental part of this strategy. The Mayor will collect and analyse relevant data and disseminate it in a manner suited to the audience.
- 6. Lobbying for change.** While the Mayor will do all he can to directly deliver the objectives of the strategy, widespread change lies in the hands of others. The Mayor will work to apply pressure to further the objectives of the Energy Strategy. This will include lobbying Government to reform national energy policy.

3.18 Although the Mayor can deliver considerable change through his own activities, he needs to work with relevant existing groups to tackle issues he cannot adequately address alone. The Mayor supports the development of partnerships that contribute to the implementation of his objectives, and will facilitate a London Energy Partnership involving all

relevant stakeholders in London. The partnership is discussed in detail in Chapter 7.

Scope of the Energy Strategy

- 3.19 This strategy provides a framework for leading change and working with others. While it spans the next ten years, this version reflects the priorities of the Mayor at this time, and is subject to further development over time.
- 3.20 The Energy Strategy aims to deal with all forms of energy – fossil fuels, renewable energy, hydrogen, electricity and heat – sourced outside London as well as locally. It focuses on more local, sustainable generation of London's power, increasing the proportion sourced from renewables. An integrated approach to heat management, particularly in buildings, is also promoted, for example, by increasing deployment of combined heat and power and community heating.
- 3.21 The strategy provides a framework for action, shaped by the Mayor's influence and the opportunity for improvement. Initiatives that the Mayor can directly affect, which also offer a large opportunity for improvement, are of highest priority.
- 3.22 Understanding how energy is used in London, and the resultant CO₂ emissions, reveals opportunities for improvement. In 1999-2000, energy used in buildings was responsible for the majority – about 80 per cent – of London's CO₂ emissions, compared to 20 per cent from transport. The three million households in the capital consume more than 50 per cent of the energy used by buildings. The remainder is consumed within the less than half a million commercial and industrial properties⁵. Although the domestic sector consumes slightly more than the commercial and public sectors, this share is distributed between almost six times as many properties. Therefore, while the scale of opportunity is perhaps greater in the domestic sector, it is likely to be more difficult to influence.
- 3.23 CO₂ is the only greenhouse gas discussed fully in the Energy Strategy. The GLA Act places an obligation on the Mayor to report on the emission of all greenhouse gases in London, and these have been covered in the Mayor's State of the Environment Report. Of the 'basket of six' greenhouse gases⁶, only CO₂ and nitrous oxide (N₂O) are emitted during the combustion of fuel. However, emission of N₂O is not directly proportional to fuel use, but related more to the conditions under which it is burned.
- 3.24 The Energy Strategy takes account of a wide range of relevant national, European and international policy documents and programmes.



Box 2: The Energy White Paper

In the Energy White Paper of February 2003, the Government sets out its view of the key energy challenges facing the UK and its agenda for tackling them. The challenges are climate change, the decline of indigenous UK energy supplies, and the need to update the UK energy infrastructure. The Government's response is outlined by the four goals set out in the White Paper:

1. To put the UK on a path to achieving a 60 per cent reduction in CO₂ emissions relative to 2000, by 2050. The Government 'expects to aim for' CO₂ emissions equivalent to between 22 and 29 per cent below 2000 levels by 2020. The reductions are split between savings from energy efficiency (50%), renewable energy (20%), transport (15%) and carbon trading (15%).

These are to be achieved through a range of policies, including an aspiration to extend renewable electricity supply to 20 per cent by 2020; a possible extension of the Energy Efficiency Commitment from 2005 to 2008, with double the level of activity; market instruments including the existing UK Carbon Emissions Trading Scheme, with a Europe-wide scheme from 2005; an early revision to the building regulations, in 2005; a proposal for Ofgem to develop a framework of incentives for distribution network operators to develop distributed generation; no plans to develop new nuclear power stations.

2. To maintain the reliability of energy supplies. The Government identifies a number of risks to the security of energy supplies, ranging from lack of investment in local infrastructure to political disruption in energy exporting regions. The latter is expected to become more important as the UK becomes increasingly dependent on imported energy.

Maintaining security of supply is based on prioritising reliability within the regulatory environment; diversity of sources, fuels and trading routes; good relations with exporting countries; competition in energy markets in the UK and beyond; monitoring of energy supply and demand; and market responses to changes.

3. To promote competitive markets in the UK and beyond. This is identified as a specific goal in itself, as well as an important factor in maintaining security of supply. The Government emphasises the need for continued price competition in domestic energy markets, through mechanisms such as the New Electricity Trading Arrangements (NETA). A review of low carbon support bodies and programmes is proposed before

the end of 2004, and there are proposals to develop the skills base necessary to maintain a healthy UK energy sector.

4. To ensure that every home is adequately and affordably heated.

The Government reaffirms its national fuel poverty strategy, adding a new target, of 'as far as reasonably practical nobody in Britain should be living in fuel poverty by 2016-2018'. It is claimed that as a result of falling energy prices, higher social security payments, national grant schemes and the Energy Efficiency Commitment, fuel poverty has fallen nationally from 5.5 million homes in 1996 to around 3 million today.

Delivery in partnership

It is the Government's view that partnership working will be critical to the delivery of its objectives on energy. It has proposed the establishment of a new Sustainable Energy Policy Network, which will include several Government departments, the devolved administrations in England, Wales, Scotland and Northern Ireland, Ofgem, and the Environment Agency.

The White Paper proposes that a strategic approach to energy policy be developed and implemented in each region. Specifically, that each regional strategy should set out a vision of its interaction with national energy policy, and specific local and regional concerns; include regional targets negotiated with national Government; set out an action plan showing how regional and local bodies will deliver the strategic objectives through their various functions; and contribute to the development of national policy.

The Mayor's view on the Energy White Paper is expressed in the lobbying section of Chapter 7.

References and notes

- 1 Royal Commission on Environmental Pollution, Energy - The Changing Climate, Twenty-second report, June 2000
- 2 Performance and Innovation Unit of the Cabinet Office, UK Energy Review, February 2002
- 3 European Commission Community Research, High Level Group for Hydrogen and Fuel Cells, Hydrogen and Fuel Cells - a vision of our future, 2003
- 4 The Royal Commission on Environmental Pollution recommended a 60 per cent reduction in carbon dioxide emissions by 2050 in its report, Energy - The Changing Climate.
- 5 3,061,000 households in 1998, 1,596,000 VAT registered enterprises in 1999. Source: London Research Centre, Focus On London 2000, 2000.

- 6 The Kyoto agreement refers to the basket of six greenhouse gases: carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydroflourocarbons (HFCs), perflourocarbons (PFCs), sulphurhexafluoride (SF₆).