

Growing, growing, gone

Long-term sustainable growth for London

March 2016



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The Environment Committee scrutinises the work of the Mayor and examines environmental issues across London, with a particular focus on the mayor's environmental strategies covering air quality, waste, biodiversity, noise, climate change and energy.

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Chair's foreword

London's population is set to grow by around 100,000 each year. At this rate by the middle of the century it may need to provide housing, workplaces, recreation, energy and water to accommodate 11 million, 12 million people or even more. This growth raises huge environmental challenges at a time when we need to be reducing them.



The next Mayor of London will need to develop effective long-term policies across all Mayoral strategies for these economic shifts, whilst at the same time improving the quality of life for Londoners, habitats and biodiversity, resilience to severe weather and London's impacts on the global environment.

This investigation has focused on four key challenges: water shortfalls and how to deal with excess water; pressures on our natural environment and maximising use of green spaces and waterways; energy needs and keeping carbon emission down; and putting the circular economy at the heart of London's economic development.

Water demand is outstripping supply and Londoners face drinking water shortfalls. At the same time sewer overflows and flood risk are becoming more of a problem as intense rainfall is expected to increase. The roll out of sustainable drainage systems (SuDS) and rainwater capture has a fundamental role. Past fragmented approaches are reaching their limits and the development of a long-term sustainable water strategy across supply, demand, drainage and flood risk needs to be embedded in statutory Mayoral strategies, including the London Plan, the Transport Strategy as well as the Environment Strategy. But even this may not be enough and the Mayor will need to debate options for a potential new major water source.

As the need for houses, schools and workplaces grows within London's existing urban footprint, so will the need to protect our green spaces and natural habitats, which will come under increasing pressure. Many green spaces are managed to provide a single benefit, but there is great potential to maximise their uses from recreation, habitat and biodiversity creation, to restoring an adjacent river to an open channel to retain floodwaters. The Mayor will need to take forward the recommendations of the Green Infrastructure Task Force, deliver on existing tree canopy and vegetation cover targets and discourage and reverse the trend of paving over front gardens.

Meeting the energy needs of London's growing population, keeping homes warm and supporting the economy, whilst at the same time accelerating carbon cuts to meet London's targets and reducing its overall energy consumption are critical challenges for the new Mayor. By now London's total emissions have been cut by 11 per cent, short of the 17 per cent required by now with 15 million tonnes more of CO₂ than if emissions had fallen into line with the Mayor's strategy. Another disappointment is our record on London's loft and cavity wall retrofits and record on solar energy. Only

the Low demand scenario in the Mayor's London Energy Plan is consistent with the 2025 and 2050 carbon reduction targets and plan for London to reduce its overall energy usage.

New technologies provide opportunities to achieve this, but also bring their own demands for energy infrastructure and supply. London will need to invest in modern energy infrastructure, especially low-carbon decentralised energy generation such as solar energy, heat networks and electricity distribution and storage. The zero-carbon homes standard should be retained and implemented.

Another key challenge is the failure of too many London boroughs in not providing separate food waste collection and their poor recycling records. This has resulted in London's recycling rate flat-lining at 33 per cent and well short of the 2015 target of 45 per cent. The EU 'circular economy' proposals have set a target of 65 per cent of municipal waste recycled by 2030.

The new Mayor must look at ways of keeping more of what we consume and produce in London, to utilise it better and waste less, in line with the waste hierarchy. We must end the futility of spending money and labour extracting materials from the environment in order to then throw a large proportion away to landfill or incineration, or losing much of the value by mixing and breaking them down in bulk recycling. Moving to a circular economy offers a solution and needs to be embedded into the heart of London's economic development strategy.

I would like to thank all those who contributed to this investigation, both during the Committee meetings and in written submissions, as their input has been valuable in producing this report.

A handwritten signature in black ink, appearing to read 'DJ', with a long horizontal flourish extending to the right.

Darren Johnson AM
Chair of the Environment Committee

Executive summary

By 2050 the city's population is likely to be over 10 million and potentially 12 or 13 million. Such growth will tend to increase the city's environmental impacts, working against efforts to moderate them. Left unchecked, the impacts would include carbon emissions, water shortage, sewage outflow, urban sprawl and habitat destruction.

There is an alternative: more sustainable urban growth offers economic opportunities, lower costs, resilience to severe weather, a more attractive city and better quality of life and wellbeing. But this sustainable growth cannot be delivered by isolating sustainability planning within an environmental policy silo. Environmental sustainability must run through all the Mayor's strategies if London is to grow successfully over the decades to come.

London faces a drinking water shortfall, but at the same time problems of excess water: sewer overflows and flood risk in the event of excess rainfall. Attempts to deal with each problem separately are running into difficulties; new approaches tackle them together, promising to be much more effective. These include sustainable drainage systems (SuDS) and rainwater capture. London therefore needs a long-term integrated water management strategy, supported by Mayoral powers and programmes. However, implementing such a strategy is difficult as water management is fragmented across many different bodies – there is a need for regulatory changes to facilitate integrated, sustainable and long-term focused water strategy.

There is huge pressure to build on London's land. But London's green spaces, brownfield sites and green features provide valuable environmental services. The tension over how much land to build on will therefore have to be managed. London's green spaces will need to be used more intelligently to maximise the benefits they can offer. This must start by evaluating each site for the benefits it provides, and those it could provide. This potential should then be fulfilled through the Mayor's planning powers and parks and green infrastructure programmes.

London needs to supply energy to increasing numbers of homes and workplaces. However, it also needs to reduce carbon emissions faster to catch up to its targets. These carbon cuts will not be made while increasing overall energy use: there needs to be a focus across Mayoral strategies and programmes on reducing the energy that people need to use.

Part of reducing energy use will involve adopting new, more efficient technologies. These will use energy in different ways and perhaps in different forms, so there will be a need for new infrastructure to deliver it, such as heat networks, vehicle charging points and electricity storage. The distribution infrastructure will also need to accommodate new sources of energy supply, such as solar panels, combined heat and power, and heat pumps.

The current economy spends much money and labour extracting materials from the environment. After use, we throw a large proportion away to landfill or incineration (damaging the environment) and lose much of the value in other materials by mixing them up and breaking them down in bulk recycling. London is vulnerable to price rises and supply interruptions of globally scarce materials. Moving to a circular economy protects against these risks, and offers job and earning opportunities. The next Mayor should therefore put a circular economy at the heart of London's economic development strategy, and direct waste management policy at the most sustainable methods of dealing with waste, including reducing the amount of waste generated, re-using, repairing, re-manufacturing and high-quality recycling. Recycling is much easier with a very large and consistent waste stream: to facilitate recycling, the next Mayor should oversee the development of a route map to standardised municipal waste collections by all London boroughs.

1. London's growth and sustainability

Key issues

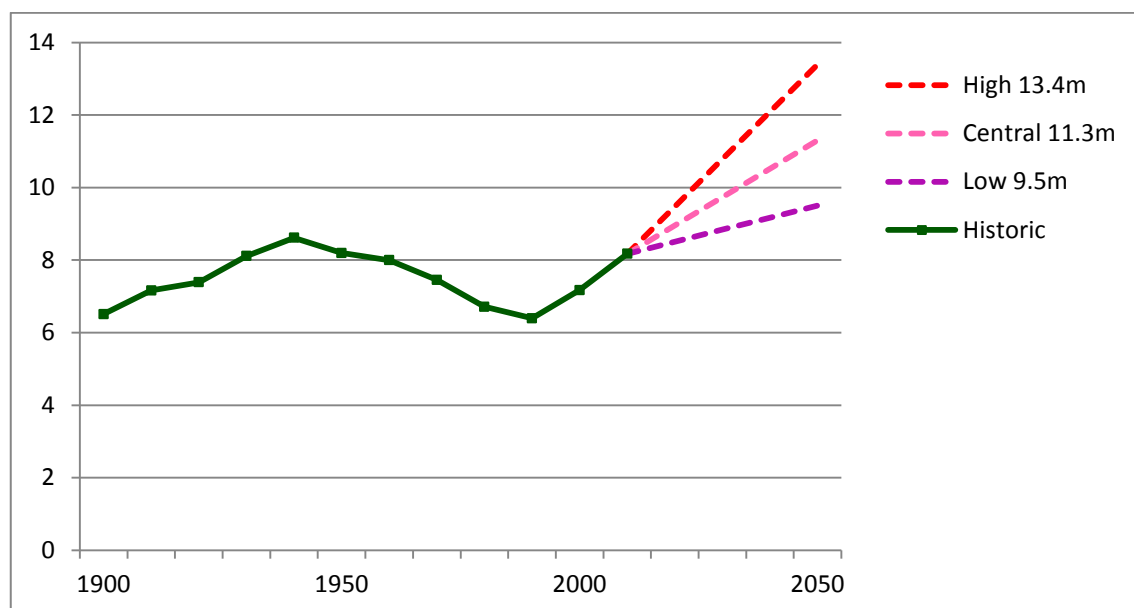
London's population is growing by around 100,000 each year, and is expected to keep growing rapidly to at least the middle of the century. By 2050 the city's population could be 11 million, 12 million or even more. Such growth will increase the city's environmental impacts, just at a time when they need to reduce. Left unchecked, the impacts would include carbon emissions, water use, sewage outflow, urban sprawl and habitat destruction.

There is an alternative: more sustainable urban growth offers economic opportunities, lower costs, resilience to severe weather, a more attractive city and better quality of life and wellbeing. But this sustainable growth cannot be delivered by isolating sustainability planning within an environmental policy silo. Environmental sustainability must run through all the Mayor's strategies if London is to grow successfully over the decades to come.

Population growth

- 1.1 London's population and economy are set to grow substantially over the next few decades. There are a number of different projections, but all reach the same general conclusion, that London by mid-century will be much more populous than ever before. The 'high' scenario used in the Mayor's Infrastructure Plan would see London at more than twice the number (and therefore twice the density) it shrank to in the 1980s.¹

London's historic and projected population (millions, Greater London area)



Figures from the GLA Intelligence Unit, used in the London Infrastructure Plan²

Environmental sustainability

- 1.2 All these extra people and their activities will require housing, workplaces, recreation, energy and water. As well as global impacts like carbon emissions, there will be local impacts like the loss of green space and wildlife habitats, more rainfall runoff, extra waste generation, and more demand for water and energy. These effects of population growth are already affecting London; poorly planned growth would greatly worsen these issues and reduce Londoners' quality of life.
- 1.3 Effective planning for growth, by contrast, can improve quality of life and maximise economic opportunities. Energy-efficient homes are more comfortable. A greener cityscape is more pleasant to live in and more resilient to the impacts of severe weather.³ An economy geared up to provide sustainability solutions is an economy ready to take advantage of the growth areas of the 21st century.⁴ Therefore, plans to grow London need to be accompanied by plans to make London environmentally sustainable.
- 1.4 This shift to sustainability cannot be achieved by seeing it as the goal of a single minor policy area. Sustainability should be a central issue for all London's strategies, including economic, transport and spatial as well as environmental.⁵
- 1.5 To some extent this is already true: environmental sustainability has informed the strategies of London's Mayors since the establishment of the Greater London Authority (GLA). But much policy development and other thinking has taken place, within the GLA and outside, in the years since the publication of the current Mayor's strategies.⁶ The forthcoming new Mayoralty provides a golden opportunity to ensure that the best of this thinking informs a new set of strategies.

The next Mayor should:

Put long-term sustainability at the heart of all Mayoral strategies, positioning London to benefit from the century's economic shifts, while improving quality of life for Londoners, biodiversity and resilience to severe weather, and reducing London's impact on the global environment.

Challenges

- 1.6 This Committee has investigated, over a number of years, the environmental challenges facing London.⁷ The biggest challenges, and those most likely to get worse as the city grows, include:
- toxic pollution in London's air
 - meeting energy needs and keeping homes warm while reducing carbon emissions to the global atmosphere
 - water management and projected water shortfalls
 - the unsustainable use and waste of physical materials
 - the loss of natural environment benefits as the urban area becomes ever more densely built up.
- 1.7 In planning this investigation, we chose not to focus on toxic air pollution as we have recently published reports on the subject.⁸ We initially selected energy and carbon emissions, water supply and green space as the topics to focus on. Waste of materials was added in response to contributions received in writing from London boroughs, the London Waste and Recycling Board and others. Therefore, this report seeks to identify important strategic objectives for the next Mayor in those four areas.

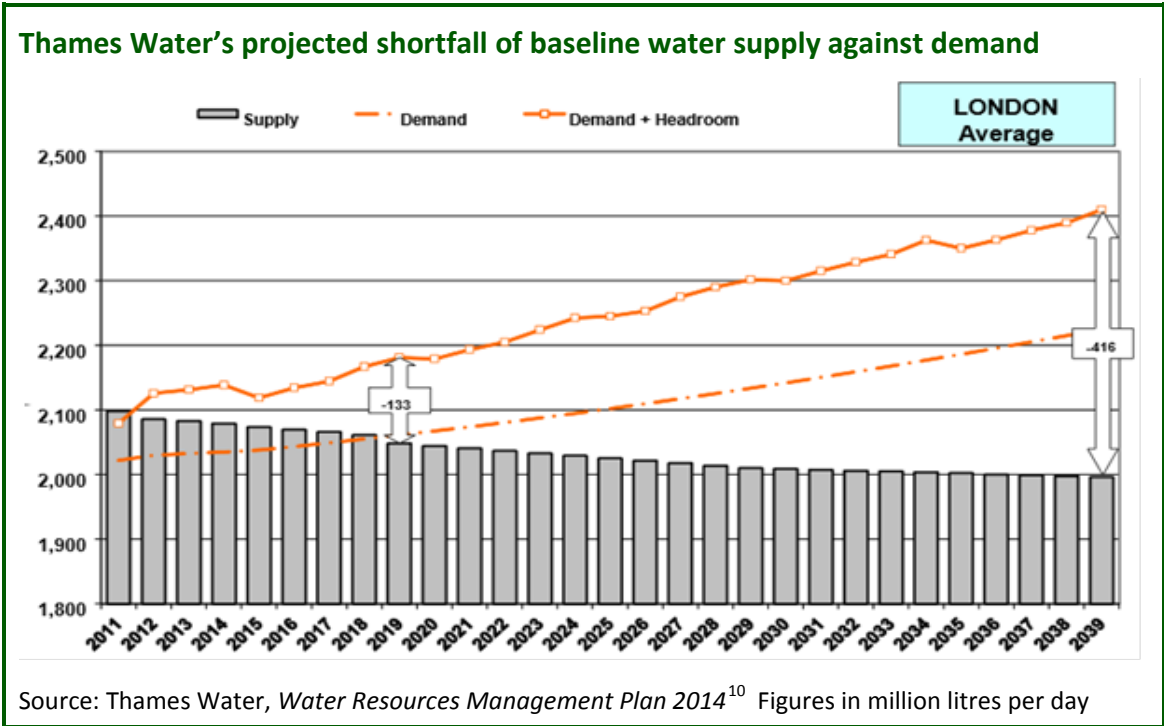
2. Water management

Key issues

London faces a drinking water shortfall, but at the same time problems of excess water: sewer overflows and flood risk in the event of excess rainfall. Past approaches to dealing with each problem separately are reaching their limits; new approaches tackle them together, promising to be much more effective. These include sustainable drainage systems (SuDS) and rainwater capture. London therefore needs a long-term integrated water management strategy. However, implementing such a strategy is difficult as water management is fragmented across many different bodies.

Water supply and demand

- 2.1 Water supply is not a new challenge. As we have previously noted and encouraged, water resource plans already incorporate significant elements of water efficiency, leakage reduction and water metering, as well as extracting water from the environment and storing it against future need.⁹
- 2.2 However, demand is still outstripping supply. Thames Water calculates the most likely water supply and demand in a year of low rainfall, and adds a ‘headroom’ allowance for uncertainty in the projections. In the baseline projections for the current Water Resources Management Plan, supply was already below demand plus headroom, and set to fall below the central demand projection by 2019. The projected headroom shortfall was 20 per cent by 2040, around half a bath full per person per day.



- 2.3 If anything, these projections from Thames Water understate the severity of the situation. These 2014 figures do not fully reflect current population growth projections and are likely to be pushed up as Thames Water updates its assumptions. The situation will become more challenging still as London grows beyond 2040.
- 2.4 Furthermore, the projections are based on a single dry year. When there are two dry winters in succession (as in 2010-11 and 2011-12) groundwater is not replenished and London's water sources become depleted, leading to restrictions on water use ('hosepipe bans'). More severe droughts (involving three or more successive dry winters) occur several times per century and so are in fact reasonably likely within a 25-year period. A third dry winter could deplete water levels to the extent that supply to households could be affected, and uses not essential to human health (such as gardening, swimming pools, outdoor washing) might be tightly restricted, bringing serious economic impacts on water-dependent businesses. It is not clear what the implications would now be of a drought any more severe than this, though such a drought has happened within the span of London's modern weather records. The allowance for low rainfall used in water resource planning should be brought towards a 1-in-100 year drought event, bringing drought preparedness nearer to the standard sought in flood risk reduction.¹¹
- 2.5 Therefore, new measures are required. Water companies have in place enough measures to keep the taps running for the next few years. Those being explored for greater use in future include: capturing rainwater on-site and using it for non-drinking purposes (such as flushing toilets, outdoor washing, or watering gardens); indirect re-use of treated waste water; or the construction of a new reservoir to capture more rainfall in wet winters.¹²

Flood risk and drainage

- 2.6 As we have previously examined, London faces growing flood risks and drainage challenges.¹³ London's greatest flood risk, taking into account existing protections such as the Thames Barrier and other river and estuary defences, is of surface water and sewer flooding in the event of a heavy rainstorm.¹⁴ London's large areas of impermeable surfaces such as roofs and tarmac mean that storm water rapidly reaches the drainage system and overwhelms it. If London were to experience an extreme rainstorm (such as those that have affected parts of the country in most years this century¹⁵), rapid flooding would ensue, with likely loss of life and property damage in the order of tens of billions of pounds.¹⁶
- 2.7 The Mayor has been developing flood risk work, through the statutory Climate Change Adaptation Strategy as well as the Water Strategy which the Mayor has drawn up proactively.¹⁷ Encouraged perhaps by our recommendations, the Mayor has pursued work to reduce London's flood risk, especially by mapping the risk of surface water flooding in the event of heavy rain, and by promoting the use of sustainable drainage systems (SuDS) and permeable surfaces. The Mayor has recently published a draft Sustainable Drainage Action Plan, and we welcome this work and broadly welcome its contents.¹⁸

2.8 However, there is a great deal of work still to do. Hundreds of thousands of Londoners remain at risk of surface water flooding, with their homes (often unknowingly) in the path that water would take draining across the surface from higher ground to lower. The Sustainable Drainage Action Plan envisages reducing flows to London's drains by one per cent each year for the next 25 years, but this target needs defining¹⁹, it will need monitoring, and it is not clear how it will be delivered. There is a great need to fit SuDS to both new and existing properties, the road network and to exchange impermeable paving for permeable wherever possible, and to ensure that properties in flood risk areas are resilient to the flooding that they are unfortunately likely to experience sooner or later. The suggestion in the draft Sustainable Drainage Action Plan that the drainage element of business water bills could be related to the impermeable surface of the premises could provide an incentive to fit SuDS and should be explored further.²⁰

Integrating water strategy

- 2.9 There are close linkages between all of these issues: single measures (such as rainwater capture) can solve multiple problems. For example, capturing rainwater from the gutters of a building reduces flood risk and the frequency of sewer overflow, and can also provide water for non-drinking uses, relieving pressure on the treated water supply. Therefore, water strategy works best on an integrated approach and London's key challenge is to bring work on these areas (and related non-water issues such as road maintenance) together.
- 2.10 However, institutional barriers stand in the way: the Mayor has an integrated Water Strategy, but this does not itself have statutory force and other bodies are responsible for delivering most areas of water management. Thames Water and London's other water supply companies have many of the relevant powers, but Ofwat and the water industry regulatory framework stipulate separate plans for drainage and for water resources. Flood risk responsibility is split, largely between the Environment Agency and local authorities. Bodies such as TfL and highways departments that manage the streetscape are not primarily responsible for drainage; neither are they for supplying water needs. There is a London Water Group to bring together stakeholders (including water companies, regulators, other water businesses, local authorities and third sector organisations) and its work should be supported.
- 2.11 Major new developments can occur within the lifetime of a water strategy and create water and drainage demands big enough to go beyond what it had planned for. A development-specific integrated water management plan can ensure that water management is upgraded to accommodate the development. Examples are underway for the development areas of Vauxhall Nine Elms and Old Oak Common and these should show the way for future development areas, including the Opportunity Areas outlined in the London Plan.²¹

The next Mayor should:

Further develop and build on work with water management bodies to secure greater integration of water strategy across supply, demand, drainage and flood risk.

Use Mayoral powers to fully support integrated water strategy, including by:

- embedding sustainable integrated water management strongly in statutory Mayoral strategies, including the London Plan and the Transport Strategy as well as a new Environment Strategy
- using Mayoral funding streams, including housing, transport and retrofit programmes, to support water strategy where appropriate
- requiring integrated water management plans for major new development areas
- continuing to support the London Water Group and ensuring that Mayoral bodies engage with its work and Mayoral water strategy.

Using these powers, promote sustainable measures such as sustainable drainage, permeable paving, dual water systems, and rainwater capture, especially where they offer multiple benefits.

Progress the work outlined in the Sustainable Drainage Action Plan, keeping it under review with regard to implementation and any additional needs emerging from population growth, development or climate change.

Lobby Ofwat and government for necessary regulatory changes to permit integrated, sustainable and long-term-focused water strategy (these may include aligning or integrating drainage plans with water resource management plans, and ensuring that longer-term strategy is drawn up before shorter-term business plans)

Engage in the debate on options for a major new water source to meet projected water shortfalls.

3. Green, blue and grey infrastructure

Key issues

There is huge pressure to build on London's land. But London's green spaces, brownfield sites and green features provide valuable environmental services. The tension over how much land to build on will therefore have to be managed. London's green spaces will need to be used more intelligently to maximise the benefits they can offer. This must start by evaluating each site for the benefits it provides, and those it could provide.

The tension between building on land and gaining environmental services from it

- 3.1 Environmental services, from flood reduction to public amenity, can be provided by 'green infrastructure' (green space, and vegetation in streets and on buildings) 'blue infrastructure' (waterways and water management features) and, to a much smaller extent, 'grey infrastructure' (hard engineering like buildings and paving).
- 3.2 There will be significant tension between the drive to increase grey infrastructure for housing and economic growth, and the increasing need for environmental services best provided by green and blue infrastructure. By 2050, London could require 10-25,000 hectares of land to build a million homes, plus more land for the associated services, infrastructure and workplaces.²² Much of this will have to be built within London's existing urban footprint; the current Infrastructure Plan does not envisage building on Green Belt land until at least 2025, although it does not rule it out after that.²³
- 3.3 While protecting green infrastructure from loss, there is also a need to increase it where possible. The current Mayor has targets to increase tree canopy cover by 5 per cent by 2025 across London, and vegetation cover in central London by 5 and then 10 per cent by 2030 and 2050. A target to restore 15km of watercourses to more natural channels by 2015 has been met, but uncertainty remains about the delivery of the additional 10km target by 2020.²⁴

The Green Infrastructure Task Force

The Green Infrastructure Task Force was established by the Mayor as part of work to take forward the Infrastructure Plan. It was Chaired by the Deputy Mayor for Environment. It advocated building green infrastructure thinking into Mayoral policy, with a strong evidence base and definitive standards. It set out specific ways to deliver enhanced green infrastructure, through a number of Mayoral and partnership initiatives. It stressed the importance of highlighting the value of green infrastructure and proposed ways to take this forward. Finally, it proposed ways to improve green infrastructure governance and secure funding.²⁵

Each piece of green infrastructure can have many benefits

- 3.4 Many green spaces are currently managed to provide a single benefit, but there is great potential for extra benefits to be gained from multi-purpose spaces. For example, a park, used for years for recreation, could have areas of grass left uncut at certain seasons, an adjacent river restored to an open channel and landscaping to retain floodwaters, delivering benefits to both biodiversity and flood risk reduction.²⁶ The report of the Green Infrastructure Task Force shows a good understanding of this principle, stressing the value of green infrastructure and the importance of gaining multiple benefits from each element.
- 3.5 A starting point for increasing the benefits from each green space is to know what benefits are currently provided. The uses and accessibility of London's spaces (from open green belt areas and upper river catchments to suburban parks, brownfield sites, and potentially green/blue features within and around built developments) need to be systematically reviewed. The London Plan and All-London Green Grid Supplementary Planning Guidance currently categorise and rank green spaces mainly by size. Better information about their uses would enable a more sophisticated categorisation, allowing these planning frameworks to operate much more effectively to protect and promote valuable blue and green infrastructure and ensure that its benefits reach all of London's areas. Boroughs would benefit from guidance from the GLA on biodiversity reporting, and potentially from help from GLA volunteering programmes.²⁷
- 3.6 Quantifying green infrastructure and biodiversity benefits should not be taken to commodify nature, but to show its value as an asset. It can help green infrastructure and biodiversity take a place in the allocation of scarce resources.
- 3.7 The London Plan is a powerful tool for green infrastructure policy, and could influence the opening up of green space that forms part of developments. It could also require that green infrastructure implications of developments be looked at strategically, as with transport.²⁸

The next Mayor should:

Seek to protect London's green and blue infrastructure and add to it where possible

Ensure London gets more environmental service benefit out of its green and blue infrastructure by strategically planning the infrastructure's multiple uses

In the Environment Strategy, set out how green and blue infrastructure will be evaluated and mapped by function, and how these functions will be protected and enhanced as London develops (this could complement or expand on the Infrastructure Asset Register)

In the London Plan, amend the green space hierarchy to take account of uses and not just area, promote the accessibility of green space and require strategic assessment of green infrastructure requirements for developments

Take forward the report of the Green Infrastructure Task Force

Encourage multifunctional uses, including enhancing drainage and biodiversity, in Mayor-funded parks programmes

Set ambitious further river restoration targets and recognise the benefits of upper river catchment flood alleviation in the next iteration of the London Plan

Look for ways to further discourage the paving over of front gardens and to reverse this trend, for example by showcasing good practice in de-paving.

4. Energy and carbon emissions

Key issues

London needs to meet the energy needs of its growing population, keeping homes warm and supporting the economy. However, it also needs to accelerate its carbon cuts to meet its targets, especially for 2025. These carbon cuts will not be made while increasing overall energy use: there needs to be a focus on reducing the energy that people need to use.

New technologies provide opportunities to achieve this, but also bring their own demands for energy infrastructure and supply. London will need to invest in modern energy infrastructure, especially low-carbon decentralised energy generation, heat networks and electricity distribution and storage.

- 4.1 The Mayor has committed to cut carbon emissions by 80 per cent by 2050, and by 60 per cent by 2025, with a strategy showing how emissions should reduce year-by-year to 2025. However, carbon reductions, and some of the programme delivery, have not kept pace with the plan so far. The most recent available figures are for 2013, and the cut achieved by then was 11 per cent – but under the strategy it should have been 17 per cent. Total emissions had by then been 15 million tonnes more than if emissions had fallen in line with the strategy. Emissions reductions in the home and workplace sectors are particularly behind schedule, and the programmes to retrofit existing buildings with energy efficiency measures need to accelerate considerably.²⁹
- 4.2 The new Mayor has an opportunity to reinvigorate this strategy in the next few years, with a view to meeting the 2025 target. The new Mayor will also need to start work on longer-term strategies to meet the 2050 target. The expected growth of London's population will be a significant factor.

The tendency of growth to drive up energy use should be resisted

- 4.3 Population growth will exert upward pressure on electricity demand. The Infrastructure Plan envisaged approximately a 30 per cent increase in population by 2050, with a 10 per cent improvement in energy efficiency, giving overall demand growth of about 20 per cent.³⁰ Increasing energy use would correspondingly increase the need for low-carbon generation. This would be a problem, since the growth of low-carbon generation is to date slower than planned, as discussed further in the next section.
- 4.4 However, overall energy use need not rise: it is in fact already falling (for all of Greater London, from 156 terawatt hours in 2005 to 132 terawatt hours in 2013, while the population grew by around three-quarters of a million)³¹ and can continue to do so. At the household level, 10 per cent savings are typically achievable in the short term with simple measures using existing technology (such as turning thermostats down, reducing draughts, using low energy bulbs and switching off appliances not in use³²), so greater savings will be possible by 2050, given new technology and appropriate

policy measures. Therefore, the assumption of growth in the Infrastructure Plan looks unnecessary, even unrealistic.³³

- 4.5 The recent London Energy Plan offers three scenarios of future energy demand, of which only the High scenario seems consistent with the Infrastructure Plan in terms of growing overall energy demand. In contrast, only the Low demand scenario is consistent with the 2025 and 2050 carbon reduction targets; this scenario, and therefore the targets, require energy use in 2050 to be reduced by nearly 30 per cent compared to 2015.³⁴
- 4.6 The Mayor has many opportunities to drive energy demand reduction, including energy efficiency requirements for new buildings and energy efficiency retrofit programmes for existing buildings
- 4.7 For new buildings, the London Plan requires all new homes to meet a ‘zero-carbon’ standard from 2016. This policy will need to be retained by the next Mayor and applied effectively to support the Mayor’s carbon reduction strategies, as the standard’s application has been suspended in national policies.³⁵
- 4.8 To retrofit existing buildings, the Mayor has the Re:New programme for homes and the Re:Fit programme for workplaces. Energy efficiency can save households and businesses money and increase wellbeing: we therefore fully support the aims of these programmes. Mayoral work could be more effective in these areas – for example, even if the current phase of the Re:New programme delivers its targets, the 2015 milestone for retrofitting homes in the Mayoral strategy is not set to be achieved before 2017. Re:Fit was doing much better against its 2015 targets, but retrofit in both domestic and workplace sectors needs to accelerate greatly over the next Mayoral term to implement the Mayoral strategy and support the 2025 carbon target.³⁶

	Re:New delivery	Estimated total delivery	Milestone 2015	Milestone 2020	Target 2025
Homes reached	113,000	500,000+	1.2 million	2.4 million	2.9 million
Easy measures fitted	80,000	400,000	9 million	11.4 million	15.7 million
Loft or cavity wall insulation installations	16,000	80,000	1.7 million	1.7 million	1.7 million
Solid wall insulation installations	4,000	20,000	60,000	586,000	731,000

- 4.9 Much further work will be needed to 2050, as the Energy Plan Low demand scenario envisages that by then all London’s homes will meet at least 2013 energy efficiency standards, with 90 per cent of older properties having major retrofit measures such as solid wall insulation and double glazing. Change on such a scale cannot be left to the end of the period and strategy developed in the next Mayoral term will be crucial.³⁷
- 4.10 Other Mayoral levers on energy demand include transport policy, where reducing energy demand goes alongside reducing costs, reducing congestion and reducing toxic air pollution, while increasing active travel and Londoners’ wellbeing.

The next Mayor should:

Plan for London to reduce its overall energy usage, for example as in the London Energy Plan Low demand scenario, rather than increase it as in the Infrastructure Plan (reduction should be particularly considered in carbon-intensive uses)

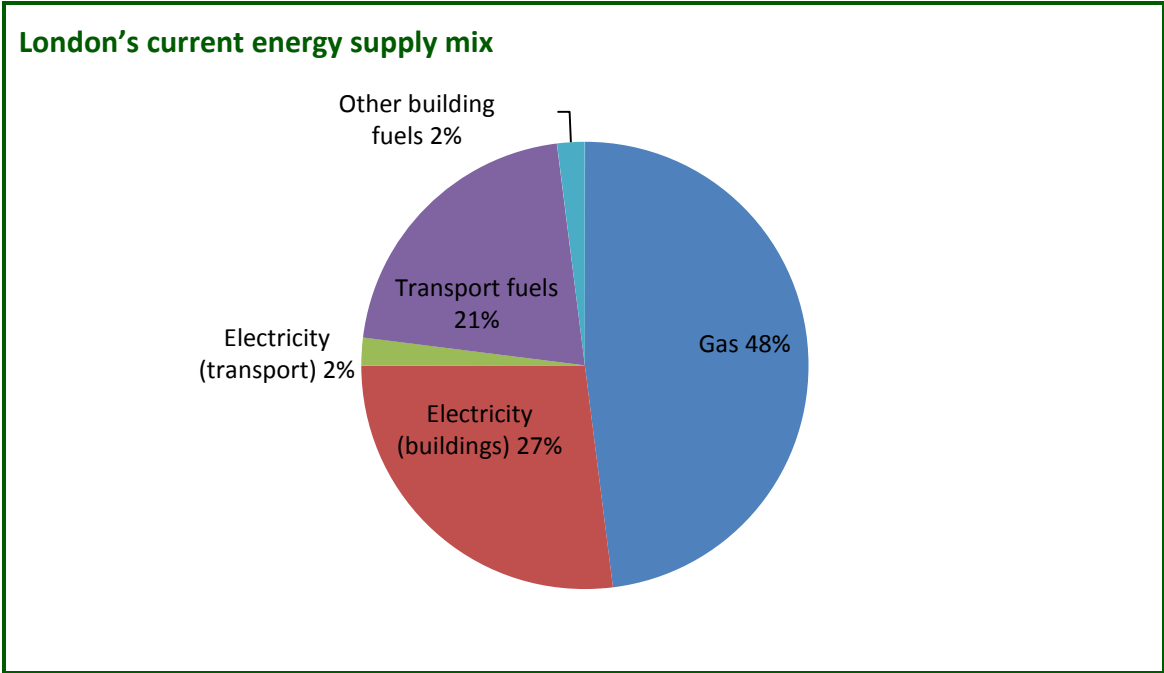
Carry energy efficiency and other demand reduction measures through to revisions of the Infrastructure Plan, London Plan, Economic Development Strategy, Housing Strategy and Transport Strategy as well as the Environment Strategy

Retain and implement the zero-carbon homes standard

Review energy efficiency retrofit programmes with a view to implementing more effective models and accelerating retrofit activity to meet the 2025 climate change targets.

London’s energy infrastructure must adapt to future energy supplies and demands

- 4.11 London’s energy is currently largely from mains gas, grid electricity and filling stations.



- 4.12 As London grows to 2050, its energy needs are unlikely to fall by 80 per cent and so the ‘carbon intensity’ – the amount of carbon emitted per unit of energy supplied – will need to reduce to make up the rest of the carbon reductions. Energy from outside London remains, so far, carbon-intensive – fossil fuels will always be so, and there has not yet been a consistent reduction in the carbon intensity of electricity in the national grid.³⁸ Therefore, low-carbon generation within London has to be an important element of London’s carbon reduction strategy. The Mayor envisages this ‘decentralised energy’ sector meeting 25 per cent of demand by 2025³⁹. The Energy Plan has two variations on its Low demand scenario: even the Centralised energy supply variation assumes a much greater role than today for decentralised generation in London; the Decentralised scenario obviously entails more still. The Centralised scenario relies on national grid electricity being decarbonised, and on the grid itself coping with much heavier use – therefore London may be pushed towards the decentralised scenario if national energy policy does not deliver a sufficiently high capacity low-carbon grid.⁴⁰
- 4.13 However, decentralised energy is not growing as fast as planned and there will need to be ‘significant changes to incentives, policies and funding’ for it to deliver the necessary contribution to the Mayoral targets.⁴¹
- 4.14 One of London’s biggest potential sources of low-carbon energy is solar power. We have recently reported on domestic photovoltaic (PV) panels, finding that there is an enormous untapped energy resource on the roofs of London’s homes, which currently supply about 1 per cent of London’s electricity but could supply 20 per cent. We recommended that Mayoral strategy should drive the installation of solar PV, including by: setting out the potential for PV and targets for achieving it; by establishing why London currently has the lowest PV installation rates in the country and tackling these barriers; and by requiring PV on new developments through planning powers.⁴² The Energy Plan, even in its centralised supply scenario but especially in its decentralised and mixed supply scenarios, also envisages a huge increase in solar power by 2050.⁴³ The current Mayor has declined to set targets for PV or require it on new developments, but the next Mayor has a chance to think again.
- 4.15 The mains gas network should see lower demand, and will need to switch to (largely) renewable fuel input – it is estimated that up to 30 per cent of current gas demand could be met by bio-methane, gas synthesised from waste and hydrogen.⁴⁴ More work needs to be done to examine how London can fully exploit its potential for bio-methane and other renewable fuels as an additional element of its low-carbon energy supply mix.

The electricity grid in particular will need investment and supportive policy

- 4.16 The electricity network, in contrast, may see heavier use, even if the doubling of electricity demand by 2050 envisaged by the Infrastructure Plan is based on an excessive assumption of overall energy use. Major new uses for electricity will include charging electric vehicles and electricity-dependent heating such as heat pumps. The

distribution network is already under pressure in some areas as London's population grows and so may need investment to increase its capacity.⁴⁵

- 4.17 London's electricity distribution network will have to be transformed to accommodate decentralised generation (potentially a very large amount, as noted above), and to facilitate smart electricity use, demand response and storage.
- 4.18 An important element of future electricity strategy nationwide is making electricity use responsive to the availability of low cost, low-carbon sources like solar power, wind and tide. Another, related, element is smoothing demand so that peak electricity use is reduced (the distribution capacity needed for large peaks is expensive to install and maintain but is often unused). With new technology, many uses, such as refrigeration, washing appliances and battery charging can be switched on or off to achieve these shifts and responses. Electricity can also be stored in batteries to provide on-demand electricity in the home without making a demand on the grid at peak usage, cost or carbon intensity.⁴⁶
- 4.19 Energy efficiency and local generation can also reduce demand on distribution infrastructure, and so offer alternative ways of ensuring that the distribution network is not over-burdened.⁴⁷
- 4.20 London's electricity grid will therefore need to have a higher overall capacity, and to meet new needs. London's energy strategy will need to look at infrastructure alongside supply and demand to ensure the city's needs are met in the best value, most sustainable way. The strategy will also need to co-ordinate with more general spatial and development planning to ensure that generation, distribution and demand are co-ordinated spatially. The Energy Plan modelling can be a useful tool for this co-ordination, as it has a strong spatial element and should enable modelling of the energy implications of new development.⁴⁸

Heat networks must be installed more rapidly if they are to make a difference

- 4.21 The GLA envisages a major role (potentially a third of London's heating by 2050) for district heat networks, supplied in the long term by low-carbon heat such as large scale heat pumps using ground, water or waste heat sources.⁴⁹ If this is to be realised, heat network installation must be reinvigorated now. The Energy Plan envisages heat networks covering most of inner London and parts of the outer suburbs, in the mixed or decentralised scenarios. The current strategy (highlighting heating needs and supporting some projects as they seek investment) is delivering less than required.⁵⁰
- 4.22 Advocates of decentralised heat must also address air pollution concerns. Current technology for providing heat to networks is based on combustion of gas or other fuels – this emits local toxic pollutants such as nitrogen dioxide, which is a major health hazard in London. The London Plan requires developments not to worsen air quality, and so air pollution improvements must be made before heat networks can go ahead with existing technology.⁵¹
- 4.23 Ultimately the air pollution question, and the carbon emissions question, may be tackled by switching heat networks to a lower emission source such as efficient heat

pumps. Heat pumps use electricity to transfer a much greater amount of heat energy from a source (which could be the ground, a body of water, or waste heat from workplaces, transport or other energy users) into the space to be heated. To anticipate this shift and enable a real impact on carbon emissions, London's heat networks must be designed and constructed from the beginning with the potential to use new energy sources.⁵²

The next Mayor should:

Develop the London Infrastructure Plan, London Energy Plan and London Plan to better show how energy distribution infrastructure and strategy will:

- Achieve London's potential for solar energy
- Promote the development of decentralised electricity generation and grid connection, including by maintaining the zero-carbon homes requirement.
- Work with the Government to establish how far the UK will bind itself to decarbonisation of grid electricity and therefore how viable is a low-carbon strategy based on centralised grid electricity.
- Deliver heat via district scale networks (actions may include planning requirements, funding, and effective action against air pollution, as well as existing policies).
- Promote the development of demand-smoothing electricity technologies such as the smart grid and energy storage.
- Adapt to a post-fossil-fuel world, especially in the case of heat networks and existing fossil fuel infrastructure.
- Allocate investment efficiently between distribution capacity, energy efficiency and decentralised generation.

5. A circular economy

Key issues

The current economy spends much money and labour extracting materials from the environment. After use, we throw a large proportion away, to landfill or incineration (damaging the environment) and lose much of the value in other materials by mixing them up and breaking them down in bulk recycling. London is vulnerable to price rises and supply interruptions of globally scarce materials. Moving to a circular economy protects against these risks, and offers job and earning opportunities.

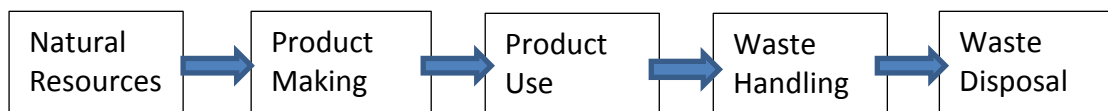
- 5.1 The 'circular economy' is a relatively new term and requires some explanation, though many aspects, from repairing goods to second-hand shops, have a long history.

What is the 'circular economy'?

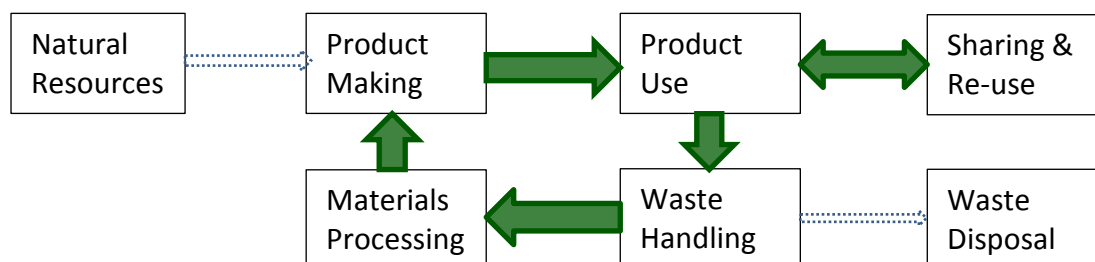
A circular economy minimises the use of virgin materials and minimises waste, by using and re-using materials efficiently. It emphasises the most sustainable elements of established waste management thinking and adds new ways of making and using goods to prevent waste. It therefore offers savings in cost, waste, carbon emissions and resources, and protects against rising prices of globally scarce materials.

The term 'circular' emphasises that materials go round the economy in cycles, in contrast to the one-time throughput of the 'linear economy'.

Linear Economy



Circular Economy



The circular economy adds:

Sharing, renting and re-use to get more total value from the same goods (for example a car club or a used phone handset)

Materials processing to make new goods from old (for example repairing a broken kettle, or recycling waste plastic into new goods of the same quality plastic)

London can reap rewards as the world shifts to a circular economy

- 5.2 The world's economy will become increasingly circular, and London can play to its economic strengths in facilitating this transition. London's business services sectors, and its knowledge and innovation sectors, can provide the new kinds of finance, contracts, business planning, data and technologies, and the innovative policy and regulation, needed to make the transition to a circular economy. All of this work for London translates into several billion pounds of commercial income every year⁵³ and tens of thousands of highly skilled jobs.⁵⁴ At the local and operational level, there will need to be a revival of declining technical skills such as repair and assembly, offering jobs also at the medium and lower range of the skills spectrum and helping reduce unemployment.⁵⁵
- 5.3 The GLA can provide leadership towards a circular economy, guidance and appropriate policies. The next Mayor can have a transformative effect by setting a tone and a vision and integrating circular economy ideas into Mayoral strategies and GLA actions. The London Waste and Recycling Board (LWARB) is already doing preparatory work.⁵⁶

The next Mayor should:

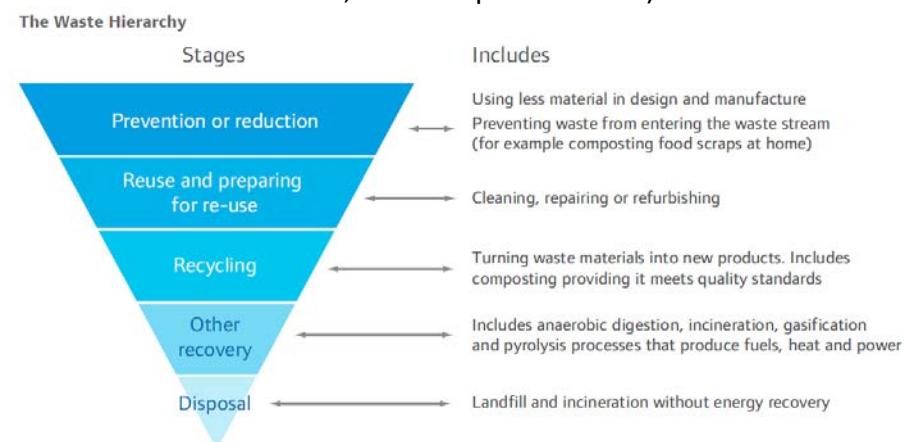
Put circularity at the heart of London's economic development strategy.

London's waste management needs to focus much more closely at the top of the waste hierarchy

- 5.4 Waste management thinking has for years been based on the 'waste hierarchy'.

What is the 'waste hierarchy'?

The waste hierarchy ranks waste management methods from the most desirable (reducing the amount that becomes waste in the first place) to the least (dumping waste in the environment, for example as landfill).



Source: Government Review of Waste Policy in England, June 2011.

- 5.5 Current waste strategy is largely directed at keeping waste out of the very bottom tier of the hierarchy, landfill and other disposal, by raising it to the two next lower tiers, incineration and recycling. The circular economy, in contrast, uses mainly the top of the waste hierarchy: waste reduction and re-use and, within recycling, the most value-preserving forms like repair and remanufacture.⁵⁷
- 5.6 Waste can be reduced by improving stock management of perishable goods, by designing goods more efficiently and even providing certain goods (as already with media such as books, movies and music) in virtual form. Goods can be re-used through business models like rental, leasing and service provision, and through the sharing economy. There are a number of enterprises in London already facilitating re-use and keeping serviceable goods out of the waste stream, but there is considerable scope for these models to expand through the economy. Reduction and re-use are under-emphasised in current waste strategies and are not even measured well.⁵⁸
- 5.7 Conventional bulk recycling can often actually lose much of the value in the materials it processes, for example by mixing together different types of plastics, or types of paper and card, and by spending energy pulping or melting materials down. It is possible, however, to preserve more of the value by sorting materials into more similar types, or by using parts as-is to make new goods.
- 5.8 Recycling processes of all sorts can be facilitated by simple changes to the way goods are designed and manufactured – for example by using screws instead of glue to assemble parts, or single materials instead of composites.⁵⁹

The next Mayor should:

Give priority and strategic focus to the top of the waste hierarchy: waste reduction; renting and service provision; and re-use.

Measure and target these parts of the waste management mix.

Next prioritise lower-carbon, value-preserving forms of reprocessing, such as repair and remanufacture, distinguishing them from destructive recycling.

Use economic development strategy to facilitate (and take advantage of) the circular economy by helping London businesses lead on design and manufacture changes and the use of reprocessed materials.

Efficient bulk recycling requires well separated waste streams of consistent quality and large scale: standardised waste collection across London could deliver this

- 5.9 The recent EU ‘circular economy’ proposals have a target of 65 per cent of municipal waste to be recycled (and less than 10 per cent landfilled) by 2030. Though a modest step towards a circular economy, this is considerably above the current London performance of recycling 33 per cent.⁶⁰
- 5.10 Efficient recycling depends on well separated waste streams, and would benefit from fewer, larger contracts for each waste type. One way to achieve this could be to establish a single London waste authority, but this would not be welcomed by local authorities because of the need to be responsive to local concerns, and because of the interrelationship of waste issues with other local services and policies.⁶¹
- 5.11 However, it might be more feasible, and potentially equally efficient, for boroughs to align their household waste collections to a standard system, for easy aggregation across London. A standard system would also be simple and convenient for householders, which would in turn increase compliance and again improve the quality of the waste streams.⁶²
- 5.12 Boroughs have contractual commitments which limit their freedom to change arrangements in the short term, but a route map to standardisation would enable them to move towards the new system and realise efficiency savings as contract renewal allows.⁶³
- 5.13 Standardisation would not mean exactly the same system for everyone. Different housing types (such as flats, terraces and houses with larger gardens) could have different arrangements. Including some business waste collections could reduce vehicle movements and simplify contracts. The Waste and Resources Action Programme (WRAP) is working at the national level on models for waste collection which could form a framework for standardised arrangements⁶⁴

The next Mayor should:

Bring together stakeholders to develop a route map to standardised municipal waste collections across London. Some business waste could be included as well.

Notes

¹ The [London Infrastructure Plan](#) covers population in Chapter 2. Another recent estimate appears in [Future Proofing London](#), by Atkins, the Centre for London and Oxford Economics

² Graph modelled on that on page 8 of the [London Infrastructure Plan](#) (also the source for the population projection scenarios). Data to re-create the historic section of the graph from London Datastore, [Historical Census Population](#).

³ [Come Rain or Shine: London's adaptation to the risks of severe weather](#).

Environment Committee report, March 2015

⁴ [Weathering the Storm: the impact of climate change on London's economy](#).

Economy Committee report, July 2015. See also Chapter 5 of this report.

⁵ [Environment Committee meeting of 10 December 2015](#)

⁶ The current Mayor, Boris Johnson, published a raft of statutory environmental strategies in his first term of office, including:

[Air quality strategy](#), December 2010

[Climate change adaptation strategy](#), October 2011

[Climate change mitigation and energy strategy](#), October 2011

[Municipal waste management strategy](#), November 2011

And has some non-statutory environmental strategies, including:

[Water strategy](#), October 2011

[Business waste strategy](#), November 2011

[All-London Green Grid](#), March 2015

Other statutory environmental strategies date back to the previous Mayoralty of Ken Livingstone, including:

[Biodiversity strategy](#), July 2002

[Ambient noise strategy](#), March 2004

Many Mayoral strategies not generally regarded as 'environmental' are in fact crucial to the environmental sustainability of London's management and growth, including:

[Transport strategy and related documents](#)

[London Plan](#) and frequent updates

[Housing strategy](#)

[Economic development strategy](#)

[Health inequalities strategy](#)

⁷ All the published reports of the Committee's investigations are available on the [environment publications page](#) of the London Assembly website

⁸ Recent reports on air pollution include: [Driving Away from Diesel](#); a [consultation response on the Mayor's Ultra Low Emission Zone](#); and a [consultation response on the UK Air Quality Plan](#).

⁹ [Water Matters](#), Environment Committee report, September 2012

¹⁰ Thames Water, Water Resources Management Plan, [chapter 6](#), paragraph 6.2.1

'Supply' and 'Demand' represent the most likely levels. 'Headroom' is an allowance

that water companies are required to make for uncertainty in their future projections of demand, yield from water sources, climate change and so on. It is explained in [Chapter 5](#).

¹¹ [Water Matters](#) report and [Environment Committee meeting of 1 October 2015](#)

¹² [Environment Committee meeting of 1 October 2015](#)

¹³ [Flood risks in London](#), Environment Committee graphic report, April 2014, and [For a Rainy Day](#), Environment Committee report, July 2011

¹⁴ Environment Committee meeting of 4 February 2016, [discussion on flood risk and climate change adaptation](#)

¹⁵ Met Office, [Past Weather Events page](#)

¹⁶ [For a Rainy Day](#)

¹⁷ [Climate change adaptation strategy](#) and [Water strategy](#)

¹⁸ [Draft London Sustainable Drainage Action Plan](#). See also [the Mayor's general sustainable drainage page](#) and the Environment Committee meeting of 4 February 2016, [discussion on flood risk and climate change adaptation](#)

¹⁹ [As noted at the 4 February meeting](#), it has not been specified whether this target refers to the total annual runoff, to peak runoff, or some other measure.

²⁰ Environment Committee meeting of 4 February 2016, [discussion on flood risk and climate change adaptation](#), [Environment Committee meeting of 1 October 2015](#), [Environment Committee visit to Barking Riverside, 3 September 2015](#), [For a Rainy Day](#), and [Response to the Mayor's Infrastructure Plan](#), Planning Committee letter to the Mayor, June 2014.

²¹ [Environment Committee meeting of 1 October 2015](#) and Environment Committee meeting of 4 February 2016, [discussion on flood risk and climate change adaptation](#)

²² [Green Sprawl: our current affection for a preservation myth?](#) London Society, 2014

²³ [London Infrastructure Plan](#) and [Response to the Mayor's Infrastructure Plan](#)

²⁴ Tree canopy target given at [GLA trees and woodlands page](#); central London vegetation target in London Plan [policy 5.10](#); river restoration targets and delivery against them discussed in [London Plan Annual Monitoring Report 11 2013-14](#) page 51 and [letter from Mayor to Assembly, April 2014](#)

²⁵ [Green Infrastructure Task Force report](#), December 2015

²⁶ [For a Rainy Day](#)

²⁷ [Environment Committee meeting of 1 October 2015](#); and Environment Committee meeting of 4 February 2016, [discussion on biodiversity](#). See also [Up or Out: A False Choice – options for London's growth](#).

²⁸ [Environment Committee meeting of 1 October 2015](#)

²⁹ [Cutting Carbon in London – 2015 Update](#), Environment Committee graphic report, November 2015

³⁰ [London Infrastructure Plan](#)

³¹ [Total final energy consumption at regional and local authority level](#), DECC, September 2015 and [GLA 2014 round of trend-based population projections – Results](#), GLA Intelligence Unit, June 2014

³² See online advice from [Energy Saving Trust](#) and [Good Housekeeping](#)

³³ [Environment Committee meeting of 5 November 2015](#)

³⁴ [London Energy Plan](#). See also [Energy for London commentary](#)

³⁵ [Environment Committee meeting of 5 November 2015](#)

³⁶ [Environment Committee meeting of 5 November 2015](#), [Could Do Better: a report card on progress with Mayoral carbon reduction targets](#), Environment Committee report July 2014, and [Cutting Carbon in London – 2015 Update](#), [Response to the Mayor’s Infrastructure Plan](#).

³⁷ [London Energy Plan](#)

³⁸ [Cutting Carbon in London – 2015 Update](#)

³⁹ [Climate change mitigation and energy strategy](#)

⁴⁰ [London Energy Plan](#)

⁴¹ [Could Do Better](#), [The Mayor’s Climate Change Mitigation and Energy Annual Report: 2013-2014](#), [London Infrastructure Plan](#)

⁴² [Bring Me Sunshine! How London’s homes could generate more solar energy](#). Environment Committee report, October 2015

⁴³ [London Energy Plan](#) – note that the solar power uptake is shown in the maps, though not mentioned in the downloadable narrative report.

⁴⁴ [Environment Committee meeting of 5 November 2015](#)

⁴⁵ [London Infrastructure Plan](#), [London Energy Plan](#)

⁴⁶ [Environment Committee meeting of 5 November 2015](#)

⁴⁷ [Environment Committee meeting of 5 November 2015](#)

⁴⁸ [London Energy Plan](#), [London Infrastructure Plan](#), [Environment Committee meeting of 5 November 2015](#)

⁴⁹ [Environment Committee meeting of 5 November 2015](#), [Climate change mitigation and energy strategy](#), [London Energy Plan](#)

⁵⁰ [Environment Committee meeting of 5 November 2015](#), [The Mayor’s Climate Change Mitigation and Energy Annual Report: 2013-2014](#)

⁵¹ London Plan [policy 7.14](#), [Environment Committee meeting of 5 November 2015](#), [Air pollution issues paper](#), Environment Committee report, December 2012, page 14

⁵² [Environment Committee meeting of 5 November 2015](#)

⁵³ [London the Circular Economy Capital](#), London Waste and Recycling Board report, December 2015

⁵⁴ [Employment and the circular economy: Job creation through resource efficiency in London](#), WRAP report for the GLA and others, December 2015

⁵⁵ [London the Circular Economy Capital](#) and [Environment Committee meeting of 10 December 2015](#)

⁵⁶ [London the Circular Economy Capital](#) and [Environment Committee meeting of 10 December 2015](#)

⁵⁷ [Municipal waste management strategy](#)

⁵⁸ [Environment Committee meeting of 10 December 2015](#), [Discussion by the Green Alliance](#) of the EU Circular Economy Package

⁵⁹ [Environment Committee meeting of 10 December 2015](#)

⁶⁰ [Environment Committee meeting of 10 December 2015](#), [Local authority collected waste from households from January 2010 to March 2015 - England data](#), Defra, and [EU 'Circular Economy Package'](#)

⁶¹ [Environment Committee meeting of 10 December 2015](#)

⁶² [Environment Committee meeting of 10 December 2015](#)

⁶³ [Environment Committee meeting of 10 December 2015](#)

⁶⁴ [Environment Committee meeting of 10 December 2015](#), and WRAP [page](#) on household recycling collection systems

Appendix 1 – Agenda for the next Mayoralty

The next Mayor should:

Put long-term sustainability at the heart of all Mayoral strategies, positioning London to benefit from the century's economic shifts, while improving quality of life for Londoners, biodiversity and resilience to severe weather, and reducing London's impact on the global environment.

The next Mayor should:

Further develop and build on work with water management bodies to secure greater integration of water strategy across supply, demand, drainage and flood risk

Use Mayoral powers to fully support integrated water strategy, including by:

- embedding sustainable integrated water management strongly in statutory Mayoral strategies, including the London Plan and the Transport Strategy as well as a new Environment Strategy
- using Mayoral funding streams, including housing, transport and retrofit programmes, to support water strategy where appropriate
- requiring integrated water management plans for major new development areas
- continuing to support the London Water Group and ensuring that Mayoral bodies engage with its work and Mayoral water strategy

Using these powers, promote sustainable measures such as sustainable drainage, permeable paving, dual water systems, and rainwater capture, especially where they offer multiple benefits

Progress the work outlined in the Sustainable Drainage Action Plan, keeping it under review with regard to implementation and any additional needs emerging from population growth, development or climate change

Lobby Ofwat and government for necessary regulatory changes to permit integrated, sustainable and long-term-focused water strategy (these may include aligning or integrating drainage plans with water resource management plans, and ensuring that longer-term strategy is drawn up before shorter-term business plans)

Engage in the debate on options for a major new water source to meet projected water shortfalls.

The next Mayor should:

Seek to protect London's green and blue infrastructure and add to it where possible

Ensure London gets more environmental service benefit out of its green and blue infrastructure by strategically planning the infrastructure's multiple uses

In the Environment Strategy, set out how green and blue infrastructure will be evaluated and mapped by function, and how these functions will be protected and enhanced as London develops (this could complement or expand on the Infrastructure Asset Register)

In the London Plan, amend the green space hierarchy to take account of uses and not just area, promote the accessibility of green space and require strategic assessment of green infrastructure requirements for developments

Take forward the report of the Green Infrastructure Task Force

Encourage multifunctional uses, including enhancing drainage and biodiversity, in Mayor-funded parks programmes

Set ambitious further river restoration targets and recognise the benefits of upper river catchment flood alleviation in the next iteration of the London Plan

Look for ways to further discourage the paving over of front gardens and to reverse this trend, for example by showcasing good practice in de-paving.

The next Mayor should:

Plan for London to reduce its overall energy usage, for example as in the London Energy Plan Low demand scenario, rather than increase it as in the Infrastructure Plan (reduction should be particularly considered in carbon-intensive uses)

Carry energy efficiency and other demand reduction measures through to revisions of the Infrastructure Plan, London Plan, Economic Development Strategy, Housing Strategy and Transport Strategy as well as the Environment Strategy

Retain and implement the zero-carbon homes standard

Review energy efficiency retrofit programmes with a view to implementing more effective models and accelerating retrofit activity to meet the 2025 climate change targets.

The next Mayor should:

Develop the London Infrastructure Plan, London Energy Plan and London Plan to better show how energy distribution infrastructure and strategy will:

- Achieve London’s potential for solar energy
- Promote the development of decentralised electricity generation and grid connection, including by maintaining the zero-carbon homes requirement
- Work with the Government to establish how far the UK will bind itself to decarbonisation of grid electricity and therefore how viable is a low-carbon strategy based on centralised grid electricity
- Deliver heat via district-scale networks (actions may include planning requirements, funding, and effective action against air pollution, as well as existing policies)
- Promote the development of demand smoothing electricity technologies such as the smart grid and energy storage
- Adapt to a post-fossil-fuel world, especially in the case of heat networks and existing fossil fuel infrastructure
- Allocate investment efficiently between distribution capacity, energy efficiency and decentralised generation.

The next Mayor should:

Put circularity at the heart of London’s economic development strategy.

The next Mayor should:

Give priority and strategic focus to the top of the waste hierarchy: waste reduction; renting and service provision; and re-use

Measure and target these parts of the waste management mix

Next prioritise lower-carbon, value-preserving forms of reprocessing, such as repair and remanufacture, distinguishing them from destructive recycling

Use economic development strategy to facilitate (and take advantage of) the circular economy by helping London businesses lead on design and manufacture changes and the use of reprocessed materials.

The next Mayor should:

Bring together stakeholders to develop a route map to standardised municipal waste collections across London. Some business waste could be included as well.

Appendix 2 – Contributors

The Committee received views and information in writing from:

Affinity Water
Bexley LA21
Bexley Natural Environment Forum
Campaign for Better Transport
Consumer Council for Water
CPRE London
Crown Estate
Environment Agency
Environmental Services Association
Extreme Low Energy
Freight Transport Association
Friends of the River Crane Environment
Institution of Civil Engineers
London Borough of Southwark
London Borough of Sutton
LEDNet / London Councils
Living Streets
London Climate Change Partnership
London Fire Brigade
London Parks and Green Spaces Forum
London Wildlife Trust
London Sustainable Development Commission
New West End Company
Urban Water Systems and Interactions Group, Imperial College London
Westminster City Council
Woodland Trust
Plus two individual residents

The Committee held three public meetings with invited expert guests:

1 October 2015

Alex Nickson, Greater London Authority (GLA)
Andrew Jones, GLA.
Richard Aylard, Thames Water
Gary Grant, Green Infrastructure Consultancy Ltd.
Tony Leach, London Parks and Green Spaces Forum
Jon Best, London Boroughs Biodiversity Forum (and LB Southwark)

5 November 2015

Patrick Feehily, GLA

Andrew Richmond, GLA

Peter North, GLA

Syed Ahmed, Energy for London

Will Dawson, Forum for the Future

Tony Glover, Energy Networks Association

Pedro Guertler, UK Association for the Conservation of Energy

10 December 2015

Clare Ollerenshaw, London Waste and Recycling Board

Andrew Richmond, GLA

Mark Ash, East London Waste Authority

David Beadle, North London Waste Authority

Dustin Benton, Green Alliance

Lucy Chamberlin, Royal Society of Arts and Manufactures

Samantha Heath, London Sustainability Exchange

Gemma George, London Sustainability Exchange

Debbie Hitchen, Anthesis Group

Rob Holdway, Giraffe Innovation

Pyarali Jamal, London Re-use Ltd.

The Committee also visited the Barking Riverside development on 3 September 2015.

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assembly.translations@london.gov.uk

Chinese

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Email 与我们联系。

Vietnamese

Nếu ông (bà) muốn nội dung văn bản này được dịch sang tiếng Việt, xin vui lòng liên hệ với chúng tôi bằng điện thoại, thư hoặc thư điện tử theo địa chỉ ở trên.

Greek

Εάν επιθυμείτε περίληψη αυτού του κειμένου στην γλώσσα σας, παρακαλώ καλέστε τον αριθμό ή επικοινωνήστε μαζί μας στην ανωτέρω ταχυδρομική ή την ηλεκτρονική διεύθυνση.

Turkish

Bu belgenin kendi dilinize çevrilmiş bir özetini okumak isterseniz, lütfen yukarıdaki telefon numarasını arayın, veya posta ya da e-posta adresi aracılığıyla bizimle temasa geçin.

Punjabi

ਜੇ ਤੁਸੀਂ ਇਸ ਦਸਤਾਵੇਜ਼ ਦਾ ਸੰਖੇਪ ਅਪਣੀ ਭਾਸ਼ਾ ਵਿਚ ਲੈਣਾ ਚਾਹੋ, ਤਾਂ ਕਿਰਪਾ ਕਰਕੇ ਇਸ ਨੰਬਰ 'ਤੇ ਫੋਨ ਕਰੋ ਜਾਂ ਉਪਰ ਦਿੱਤੇ ਡਾਕ ਜਾਂ ਈਮੇਲ ਪਤੇ 'ਤੇ ਸਾਨੂੰ ਸੰਪਰਕ ਕਰੋ।

Hindi

यदि आपको इस दस्तावेज़ का सारांश अपनी भाषा में चाहिए तो उपर दिये हुए नंबर पर फोन करें या उपर दिये गये डाक पते या ई मेल पते पर हम से संपर्क करें।

Bengali

আপনি যদি এই দস্তাবেজের একটি সারাংশ নিজের ভাষায় পেতে চান, তাহলে দয়া করে ফোন করবেন অথবা উল্লিখিত ডাক ঠিকানায় বা ই-মেইল ঠিকানায় আমাদের সাথে যোগাযোগ করবেন।

Urdu

اگر آپ کو اس دستاویز کا خلاصہ اپنی زبان میں درکار ہو تو، براہ کرم نمبر پر فون کریں یا مذکورہ بالا ڈاک کے پتے یا ای میل پتے پر ہم سے رابطہ کریں۔

Arabic

الوصول على ملخص لهذا المستند بلغتك،
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