

The impact of climate change on London's economy

A summary of views and information

December 2014



Economy Committee Members

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Terms of reference for this investigation

- To map the likely effects of climate change on the London economy; identifying the sectors most at risk and the likely effects on jobs and prosperity;
- To establish best practice amongst the business community, in terms of risk assessment and adaptation strategies; and
- To make recommendations addressing the risks from climate change to the London economy to the London Enterprise Panel and the Mayor, and potentially other representatives of London Government where appropriate.

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Chair's foreword



Jenny Jones AM
Chair, Economy
Committee

We have long known that climate change will have a significant impact on our economic prosperity. Lord Stern issued a stark assessment in 2006 in his Review on the Economics of Climate Change, estimating that if left unchecked the costs could be equivalent to as much as one fifth of the world's economic output each year.

But we have found, in the course of this investigation, that we still know too little about the costs to London's economy.

When I think about the impacts of climate change on London, my mind jumps to the Thames Barrier protecting us from sea level rises. But we have heard that our city will also be exposed to more frequent and severe problems with overheating and flooding from rainfall.

The committee has also heard that London's economic links with the rest of the world expose us to many less obvious risks.

Businesses import risks through their supply chains and own risks affecting their overseas assets, particularly when they involve countries that are more vulnerable and less well placed to adapt. We have heard that this is already happening, with floods in Thailand affecting the global IT industry, for example.

With trillions of pounds of assets potentially at risk, these ripples on the surface of our economy could be early warnings of something much more disruptive to come.

These risks are complicated by uncertainty about the level of global warming we can expect to experience. If world leaders are unable to secure the reductions in greenhouse gas emissions that we need in the upcoming conference in Paris, global average temperatures may rise by four or even six degrees, putting severe strain on our ability to adapt and – in the words of the Intergovernmental Panel on Climate Change – potentially compromising common human activities such as growing food.

We have heard that all of these risks, and their relevance to businesses in London, are still poorly understood.

So I haven't been surprised to learn that businesses are not fully prepared for the changes to come. It has been encouraging to hear from business leaders that are showing the way, and I hope our report will encourage more to follow their example. Small businesses are the least likely to have address these issues, which is unsurprising when most are focussed on making it through the next six months, so we must find a way to engage and protect them.

It has also been positive to hear about the opportunity for London to lead the world in services that build resilience into our economies. This 'adaptation sector' is already estimated to have a turnover of £431 million, and needs to grow.

This report marks a significant moment in the Committee's work on this pressing issue. I hope it will inform policy makers, stimulate new thinking, and convince you that further work is needed to secure our future prosperity.

A handwritten signature in black ink, reading "Jenny Jue". The signature is written in a cursive, flowing style with a long, sweeping tail on the final letter.

1. Introduction: The economic challenges of climate change

“Preparing for extreme weather and further climate change is about managing risks and increasing our resilience to them – it is therefore as much about the economy, quality of life and social equality, as about the environment. Early action today will not only manage current and future risks, but save Londoners money and create jobs.”

The Mayor’s Climate Change Adaptation Strategy, 2011

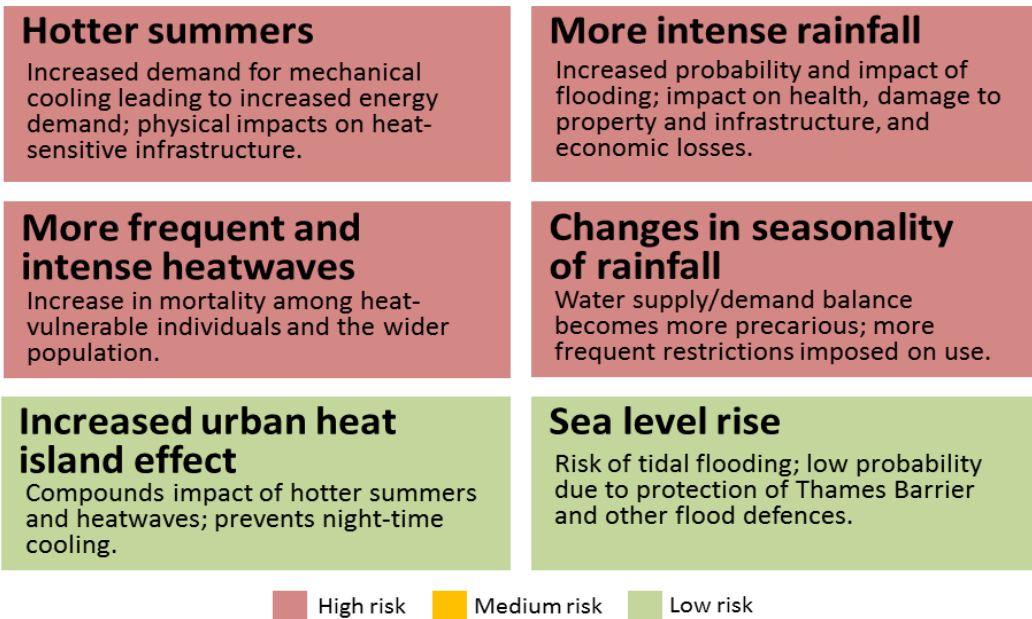
As the Mayor has stated, “there is clear evidence that our climate is already changing... and that we run the risk of experiencing significant changes to our climate that will dramatically impact on our quality of life and the economy.”¹ However, there remains considerable uncertainty about what level of global warming will occur in the coming decades, because of the difficulty of long-term projections, and the uncertainty about both the outcomes of global negotiations on mitigation efforts and the implementation of agreed measures by governments.

The UK Government and most other governments are committed to the aim of limiting average global temperature rises to a maximum of 2°C above pre-industrial levels, although the World Bank has estimated that even if all current pledges are met, the temperature could rise by up to 4°C by 2100.² This finding has been echoed by other analyses, including those released recently by the United Nations Environment Programme and PwC.³

The physical impacts of this change will not be uniform across the globe. For London, the Greater London Authority and Carbon Disclosure Project have recently identified the major impacts expected in the city, including more intense rainfall and more frequent heatwaves. These impacts are summarised in Figure 1 overleaf and are the subject of a separate investigation by the London Assembly’s Environment Committee.⁴

In recent years, there has been an increasing focus among researchers and policy-makers on the potential economic impact of the complex set of trends associated with climate change. In 2006 the UK Government published findings of a review on this topic led by the economist Lord Nicholas Stern, which concluded that the overall costs of climate change –

Figure 1: Current and anticipated effects of climate change in London



Summarised from: Carbon Disclosure Project, *Data provided for the CDP Cities 2013 report: Greater London Authority, 2013*

if mitigation and adaptation measures are not taken – could be equivalent to losing at least five per cent of global annual Gross Domestic Product (GDP), and perhaps as high as 20 per cent.⁵

We know even less about the likely economic impacts at city level, and so the focus of this investigation is on the hundreds of thousands of businesses that are based in London. The amount of information available to support them is limited for a number of reasons. There is a great deal of uncertainty about likely future impacts and the timescales seem beyond some business planning timeframes. Many, especially smaller businesses, lack the capacity and resources required to identify and address the risks they face. Clearly, a number of firms are taking proactive steps in this area, but commercial sensitivities may make them reluctant to publicise their work, which limits the amount of shared learning that is possible.

This report presents a summary of what we have heard so far, and identifies a series of questions that constitute a stress test for the Mayor and the London Enterprise Panel, which he chairs. These are designed to assess whether key decision-makers are doing enough to support London's businesses to face the challenges of climate change.

How are the Mayor and London Enterprise Panel incorporating climate change risks into their economic strategies for London?

2. Risks for London businesses

“Responding to climate change is perhaps the biggest global challenge of the 21st Century, and the transition to a low-carbon economy will require investors to take account of the reality of a carbon-constrained world. This shift is happening, but there are obstacles to overcome – stock markets are currently over-valuing companies that produce and use carbon...”

House of Commons Environmental Audit Committee, 2014

The UK Climate Change Risk Assessment, published by the Department for Environment, Food and Rural Affairs in 2012 identified ten distinct risks for business arising from the effects of climate change. These included reduced returns for UK financial institutions’ investments (due to the absence of mainstreaming climate risk and adaptation into decision-making processes) and a decrease in output for UK businesses (due to an increase in supply chain disruption as a result of extreme events).⁶

Supply chain vulnerability

One of the recurring themes of our investigation has been that the London economy is affected by climate change impacts occurring overseas, as well as those in the UK. Daniel Dowling, Assistant Director of Climate Change and International Development at PwC, emphasised this to the Committee:

London, as a globalised city, is potentially 'importing' a great deal of risk through its financial services sector and the international supply chains of large and small businesses. If we are looking to assess the total economic impact of extreme weather events and climate change on London's competitiveness, then we need to improve our understanding of the scale and distribution of these international risks. In addition to our growing appreciation of local physical risks here in London, we need to extend the scope of our analysis to include the risks to our business with interests abroad, where appropriate risk information is limited and the vulnerability of assets and operations is often higher.⁷

A key component of the London economy risk assessment is the international supply chains which many London businesses depend on. We have heard a number of examples where severe weather episodes in one part of the world disrupt economic activity elsewhere. For instance,

To what extent have London businesses identified the major risks in their supply chains?



A container ship unloading at Tilbury docks in Essex: London's economy depends on global supply chains that often originate in countries highly vulnerable to climate change. *Image: Ashley Dace*

the 2011 floods in Thailand affected computer supplies worldwide as the affected area was the centre of global hard drive manufacturing.

The UK's international trade represents around 65 per cent of our Gross Domestic Product (GDP),⁸ and London trades more than any region except the wider South East. The total value of goods and services imported to London in 2013 was around £72 billion, while the value of exports was £33 billion.⁹

What steps can be taken at a London-wide level to help map the supply chain dependencies of the city's economy?

The Committee on Climate Change, an advisory body to the UK Government, reported recently that supply chain disruptions can lead to loss of revenue, reduced productivity and a fall in share price for businesses. It also identified a significant skills gap among supply chain professionals, many of whom have not been sufficiently trained to understand supply chain complexity. The biggest vulnerabilities tend to exist in the earliest stages of a supply chain – particularly in developing countries in South and South East Asia and in Sub-Saharan Africa – but these can be overlooked if businesses only consider the risks faced by their immediate suppliers:

The largest climate risks to supply chains appear to be in the earlier stages of product manufacture. These tiers of the supply chain are less likely to be

understood and managed by UK businesses. Our analysis suggests a larger proportion of value in the earlier stages of production is generated in countries that are at a moderate or higher risk from climate change.¹⁰

Over-valued investments

London is a global centre for the financial services industry. A fifth of London’s Gross Value Added (GVA, a measure of regional economic output) comes from the finance and insurance sector, which employs around 350,000 Londoners.¹¹

We heard that the prosperity of London’s financial services industry may be at risk because its investments are vulnerable to the impacts of climate change. UK investors have £10 trillion of assets abroad (2011 figure), including in many countries with significant vulnerabilities to the effects of climate change. Figure 2 below lists the top 25 country destinations for UK investments, and the amount of assets held there.

A particular concern is the extent to which major investors based in London – including banks, insurers and pension funds – have made investments in carbon, specifically fossil fuels. This was highlighted in a recent report from the Carbon Tracker Initiative, which discussed the

Figure 2: Value of UK assets abroad by country, 2011

Country	Value of UK assets (£bn)	Country	Value of UK assets (£bn)
United States	£2,784	Hong Kong	£112
Germany	£910	Singapore	£108
France	£867	Sweden	£96
Netherlands	£612	Brazil	£74
Japan	£439	Denmark	£73
Ireland	£409	Finland	£65
Switzerland	£336	South Korea	£56
Luxembourg	£296	India	£52
Spain	£282	Norway	£46
Italy	£262	Russia	£43
Australia	£196	South Africa	£42
Belgium	£180	China	£41
Canada	£167		

Source: PwC, *International threats and opportunities of climate change to the UK*, 2013

value of investments on the London Stock Exchange that are dependent on fossil fuels:

The UK has less than 0.2 per cent of the world's coal, oil and gas reserves, and accounts for around 1.8 per cent of global consumption of fossil fuels. Yet the CO₂ potential of the reserves listed in London alone account for 18.7 per cent of the remaining global carbon budget. The financial carbon footprint of the UK is therefore 100 times its own reserves... With approximately one third of the total value of the FTSE 100 being represented by resource and mining companies, London's role as a global financial centre is at stake if these assets become unburnable en route to a low carbon economy.¹²

What is the scale of the risk facing investors based in London, in relation to their exposure to a fall in the value of carbon investments?

The Committee has heard of the risk of a 'carbon bubble', which is based on the idea that fossil fuels have been over-valued in investment markets, because of the possibility that future restrictions reduce their value. For instance, international negotiations culminating at the United Nations Framework Convention on Climate Change conference in Paris in late 2015 may result in an agreement that restricts carbon assets from being exploited. As Professor Samuel Fankhauser of the Grantham Research Institute at the London School of Economics explained to the Committee:



'The Source' exhibition at the London Stock Exchange: Investors based in London may be at risk from the 'carbon bubble' bursting if fossil fuel investments lose significant value. *Image: Kai Hsutai*

It is true if you just do the basic atmospheric physics that we can burn about one third of currently known reserves and then the atmosphere is full, which means two thirds have to be written off in one way or another. The good news, in a sense, is that this is now fairly well known by many people, including many investors.¹³

However, companies have continued to invest in fossil fuel assets. A report from the Carbon Tracker Initiative and Grantham Research Institute showed that the stock market in London increased its exposure to carbon (particularly coal) by seven per cent between 2011 and 2013, and that fossil fuel companies were spending US\$647 billion per year exploring new reserves.¹⁴ One of the world's biggest oil and gas companies, Shell, recently wrote to its shareholders to reassure them of the value of its carbon assets:

Indeed, changes in regulatory priorities could well be relatively sudden. However, because of the long-lived nature of the infrastructure and many assets in the energy system, any transformation will inevitably take decades. This is in addition to the growth in energy demand that will continue until mid-century, and possibly beyond. The world will continue to need oil and gas for many decades to come, supporting both demand, and oil and gas prices. As such, we do not believe that any of our proven reserves will become "stranded".¹⁵

A divestment movement appears to be underway, with some investors deciding to discontinue investing in fossil fuels.¹⁶ London's financial services sector could be affected negatively by such a move, particularly if it takes place suddenly, although there may be wider benefits for climate change mitigation efforts. Simon Howard of the UK Sustainable Investment and Finance Association (UKSIF) highlighted the uncertainties of how this change in investment practices may occur:

What are the risks and opportunities of the fossil fuel divestment movement for London, and how can these be managed?

At this stage, if we consider the large investors, the things that are going to suffer are large listed companies, BP, British Gas, Exxon, the people who we might expect to benefit are at this stage small and unlisted and therefore not easy for regulated asset owners to invest in. Therefore one cannot simply say to a pension fund, "Sell transport, sell oil, sell mining, and invest in wind turbines", because there is far too much money there, compared to that opportunity, and this opportunity is frequently in the venture capital/private equity space, and regulators treat assets held in those in a different way.¹⁷

The Bank of England has recently announced that it is conducting an inquiry into the possibility of fossil fuel reserves becoming stranded assets.¹⁸

Ability to insure climate change risks

The insurance industry has a vital role in the economy, helping to protect businesses against risk. As noted in the introduction to this report, climate change is expected to exacerbate a number of risks businesses face, and place financial pressures on insurance companies.

For instance, a recent report from the Met Office and the Association of British Insurers found that a 4°C rise in global average temperatures would lead to a 14 per cent increase in annual insured losses caused by floods in the UK.¹⁹ The risks for UK companies do not just come from domestic events; 30 per cent of premium income for members of the Association of British Insurers is earned overseas.²⁰

An implication of this may be that insurance cover becomes less available to businesses. For instance, in a recent survey of businesses by the consultancy Marsh, 63 per cent of respondents said they expected property assets with lower resilience would become uninsurable in the future.²¹ The Committee heard about this prospect from Nick Beecroft of Lloyd's of London:

The industry has no capacity to insure climate change. We cannot continually keep paying the costs of the same climate-driven events generating the same damage.²²

Additionally, from Tom Burke, Chair of E3G:

I suspect that we are going to find it increasingly difficult for businesses to get insurance if they are in high-risk areas for floods in particular, and also other weather-related events.²³

A written submission from the British Property Federation highlighted the particular risks for smaller businesses seeking to obtain flood insurance:

Small and medium-sized enterprises (SMEs) are more vulnerable than big businesses and their existence could be threatened if they are unable to afford their flood insurance premiums... SMEs are finding it increasingly difficult to obtain flood cover in high risk areas. This could have negative impacts on the UK economy as a whole but at a local level, on those communities who may lose access to local retailers and service providers.²⁴

How can London address an apparent shortage among the workforce of skills needed for climate change adaptation?

Skills gaps to support adaptation

One of the barriers for firms in responding to climate change risks is a lack of necessary skills among the workforce. In a previous Economy Committee report, we identified a skills shortage in the building retrofit industry, particularly among property assessors.²⁵ At our meeting in October, Mark Jenkinson of Siemens highlighted a shortage of engineers needed to help build resilient infrastructure.²⁶ Dr Outi Korkeala of Ricardo-AEA explained that this was one of the findings of her recent research into the economics of adaptation for the European Commission:

We modelled the employment implications of adaptation... we looked at the occupations, the skills needs up to 2050, and exactly those skills – for example statisticians, research and development, building and civil engineering, technicians – those are the skills that are needed in terms of adaptation and mainstreaming adaptation.²⁷

A recent survey of businesses by the Institute of Environmental Management and Assessment found that large majorities of respondents did not feel their workforce was adequately trained in sustainability, across the areas of finance, product development and procurement. The survey also found 48 per cent of firms said recruitment of sustainability professionals with the necessary skills was problematic, and 42 per cent had met barriers in securing appropriate training for their staff.²⁸

3. Business adaptation to climate change

“The business, industry and services sector is vulnerable to climate change due to the combination of the sector’s climate sensitivity and adaptive capacity. Although the majority of the risks identified in this risk assessment fall into the category of climate sensitivity, a number of risks to the sector are the result of low adaptive capacity, and in particular, a low recognition of the need to act on climate change. This crucially needs addressing in order to minimise the potential risks and seize opportunities.”

Department for Environment, Food and Rural Affairs: Climate Change Risk Assessment, 2012

Firm-level adaptation

The potential impacts for individual businesses may differ significantly. This makes it important that they identify their own specific risks and understand how business processes can be adapted to address them.

A number of tools and frameworks are available to businesses and other organisations, to enable them to assess their exposure and to devise business continuity or adaptation plans. These include the Business Resilience Health Check, an online tool developed by Climate UK, Business in the Community and the Environment Agency, which helps businesses assess their risks and identify actions they can take.²⁹ In the Mayor’s Climate Change Adaptation Strategy, he promotes the Business Areas Climate Impacts Assessment Tool (BACLIAT), produced by the UK Climate Impacts Programme (UKCIP), which helps businesses assess their climate change-related vulnerabilities in the areas of financing, market demand, logistics, production processes and service delivery, workforce and customers, building premises and management implications.³⁰

To what extent have businesses in London taken necessary steps to identify climate change risks and develop adaptation plans?

The Committee has heard that smaller businesses face particular challenges in responding to the risks of climate change. As suggested by Dr Outi Korkeala of Ricardo-AEA:

There are plenty of tools available, for example the Environment Agency Climate Ready website. Whether those tools are useful, particularly for small businesses, it must be considered that sometimes when you talk about

climate change, the risks... may be in 10 to 20 years' time. A small business is normally operated on a much shorter horizon.³¹

Additionally, by Professor Chris Rapley of the London Climate Change Partnership:

Have the Mayor and LEP identified the specific challenges faced by smaller businesses in addressing climate change risks?

The evidence is that it is the small and medium-sized enterprises [that are most vulnerable to climate change]. The point is the extent to which they have either the capital, the time or intellectual capacity to think through these rather longer-term strategic issues when they tend to be living more hand-to-mouth, perhaps, than some of the bigger companies that can take risk management in a deeper and more profound way.³²

Evidence of adaptation

We have considered the available evidence on steps businesses are taking to respond to these challenges. This can be difficult because information a business holds about the impacts of climate change on its activity and adaptation measures is often considered commercially sensitive, and is therefore not publicly disclosed.³³

Some businesses and business groups have shared information on their adaptation plans. For instance, the Committee heard from the retailer Marks and Spencer about its adaptation strategy:

M&S currently has an adaptation strategy and is now working to integrate specific actions into existing processes ranging from planned, preventative maintenance regimes, retrofit specifications of equipment, up-skilling of relevant staff and tabling climate change risks at relevant high-level property decision making meetings.³⁴

Team London Bridge – Green infrastructure

Team London Bridge is a Business Improvement District – a membership body for businesses, which raises funds to spend on improvements to the local area – in Southwark. It has been taking steps to improve green infrastructure in the London Bridge area, which among other benefits will help boost flood alleviation for businesses.

Working with the Greening the BIDs programme, Team London Bridge carried out a Green Infrastructure Audit to identify 3.7 hectares of potential green roof space, 49 sites for rain gardens and 33 sites for green walls. Work is underway to fund and deliver these projects, providing an example of how businesses can work with each other and public agencies to address potential impacts of climate change.³⁵

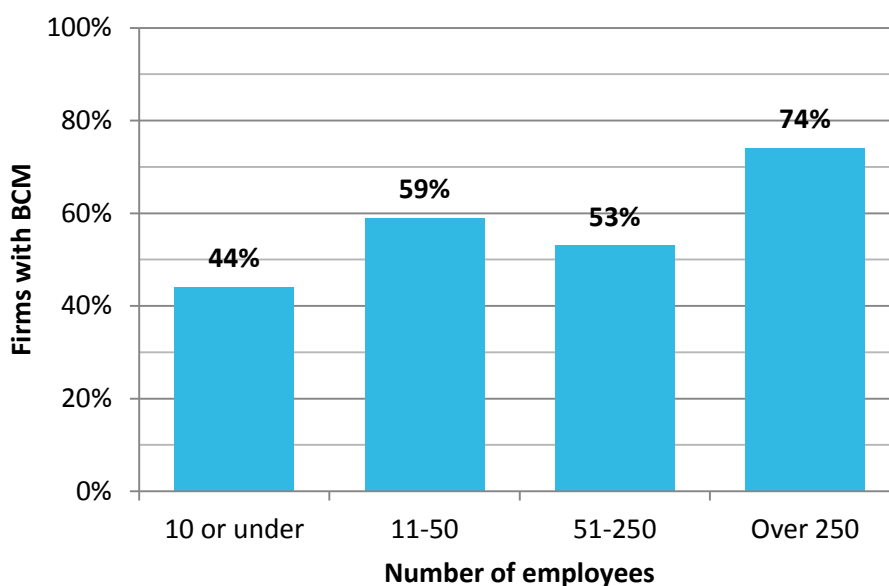
We have also heard about work undertaken by the supermarket chain Asda to address climate change risks in its supply chains. The company has identified, for instance, that 95 per cent of its fresh produce is at risk from climate change. Asda has set out ways in which it is working with its suppliers to ensure they can adapt; for instance, one supplier was supported to increase its resilience to water shortages at a potato processing factory.³⁶

How can the Mayor and LEP monitor the uptake of adaptation measures across the London economy?

A small number of surveys have been conducted that examine how many firms have assessed their climate change-related risks and developed business continuity or adaptation plans. These are typically UK-wide, and no comparable evidence on adaptation by London businesses is available; the Environment Agency told the Committee it may consider working with the London Climate Change Partnership to address this gap in evidence.³⁷

In 2012 a Carbon Disclosure Project survey of FTSE 100 firms found that 80 per cent of them had identified substantive risks to their business from climate change, but only 46 per cent had incorporated climate change into their business strategy.³⁸

Figure 3: Use of business continuity arrangements (BCM), by organisational size, UK, 2013



Source: Chartered Management Institute, *Weathering the Storm*, 2013

What further support needs to be provided to smaller businesses, and who should deliver this?

In 2013 the Chartered Management Institute, working with the Cabinet Office and other partners, published a survey of organisations, asking about the impact of severe weather disruptions and whether they had put in place business continuity management (BCM) arrangements to address this and other risks. The survey found that public sector organisations (72 per cent) are significantly more likely to use BCM than those in the private (58 per cent) and voluntary (58 per cent) sectors. Responses also differed according to organisational size. As shown in Figure 3 on the previous page, larger organisations are more likely to use BCM than smaller organisations (all sectors).

Support from the financial services industry

Financial services firms may have an important role to play in helping other London businesses to adapt to the risks of climate change, through their role as investors, creditors or insurers.

A 2013 report on climate change risks from PwC highlighted the possible role of insurance firms in helping clients adapt to risks:

The insurance industry, with its risk management expertise and skills, is well-positioned to help society reduce its vulnerability and improve its community resilience. Greater resilience not only helps to reduce the impacts of adverse events but also help to lower insurance premiums. The insurance industry is keen to reward preventive measures through lower premiums, and in return benefit from the lower volatility in losses as a result of lower frequency and magnitude of claims.³⁹

Banks may also be well-placed to help their business clients, particularly smaller businesses, to focus on their climate change-related risks and consider adaptation plans. This could involve, for instance, encouraging them to use an adaptation planning tool at the time of a loan application. As Tom Burke of E3G suggested to the Committee:

How can financial services companies support other businesses to address climate change risks?

The people who share that risk with the businesses are the banks that are lending them their operating capital. All of the businesses go to the banks, and it seems to me the retail banks could play a much more positive role in helping their business customers understand these risks and prepare contingencies for handling those risks... building some relationship between the retail banks and those small business customers to help with resilience.⁴⁰

Adaptation planning

As discussed, there is considerable uncertainty about the future extent of global warming and the effects of a changing climate, and there will be significant variation in impact across and within regions. It is therefore important for firms to identify their own specific risks and to ensure they are able to adapt. The Committee heard from Juliette Daniels of the London Climate Change Partnership about how firms can approach this task:

You can fall into a bit of a trap of looking just at scenarios and thinking that you have to pick one to adapt to. Actually, if you take a context-first approach and look at your thresholds and your tolerances within your operations and your organisation, you will have a very good understanding of the types of action you can take in different scenarios without having to know what that future is going to be.⁴¹

Considering plans being developed at a city-wide or regional level, the Committee has heard about the benefits of a pathways approach to adaptation, which emphasises flexibility. This is recommended in the Mayor's Infrastructure Plan, in relation to water sustainability, and has been used by the Environment Agency in its plan for managing tidal flood risk in the Thames Estuary.

The Environment Agency worked with the Met Office and other partners to assess the flood defences that will be required in the estuary over the next 100 years, and how that will change depending on the level of sea rise resulting from climate change. Their plan includes five adaptation responses depending on the level of sea rise, each of which was consulted on. It provides the Environment Agency with the lead-time needed to plan and construct each option, at the point at which decisions need to be taken, and it gives the agency the ability to move from one adaptation option to another depending on the actual rate of climate change.⁴²

A submission from Ashley Kingsborough and Professor Jim Hall of the Environmental Change Institute at the University of Oxford explained the benefits of this:

'Adaptation pathways' approaches seek to maximise flexibility and minimise sensitivity to climate change scenarios by delaying decisions until critical thresholds are achieved. Such approaches are increasingly relevant to adaptation planning in London. They are utilised in the Thames Estuary and being developed in response to heatwaves, droughts and surface water flooding. Critical components of assumption based planning are the

identification of adaptation thresholds or levels or tolerable risk and the incorporation of ongoing monitoring to inform the prioritisation of future actions. The emphasis upon reacting flexibly to change as it materialises reduces the reliance on assumptions about future scenarios...⁴³

4. Opportunities in the climate change adaptation sector

“Sales of adaptation goods and services by UK companies have grown in recent years, and at a faster rate than general growth in the UK economy. UK companies provide key adaptation goods and services such as flood protection and resilience measures, professional services including architecture and engineering, and finance and insurance products and services. But the sector remains small and sales by UK companies appear to have grown more slowly than those of competitors in other countries.”

Committee on Climate Change: Adaptation Sub-Committee Progress Report, 2014

The need to address climate change risks is creating new economic opportunities. There is demand for new goods and services that facilitate and support climate change adaptation, which businesses in London may be able to exploit.

The Committee on Climate Change recently carried out an assessment of the size of the adaptation sector in the UK.⁴⁴ As shown in Figure 4 below, this identified sales of adaptation goods and services in a number

Figure 4: Sales and export growth potential, UK adaptation sector

Sector	Adaptation sales, 2011/12	Assessment of export growth potential
Architectural	£270 million	High
Climate change management	£80 million	Medium-High
Construction and retrofit	£660 million	Medium
Environmental finance	£220 million	High
Finance investment and insurance	£190 million	High
Risk management and business continuity	£100 million	High
Sustainable drainage and water management	£120 million	Medium
Transport infrastructure	£490 million	Low
Water irrigation	£10 million	Medium-High

Source: Adapted from Committee on Climate Change: Adaptation Sub-Committee Progress Report, 2014



Flood protection at the Olympic Park: The adaptation sector is providing opportunities for London businesses to sell goods, services and expertise to address climate risks. *Image: Paul Hudson*

of sub-sectors, and provided an assessment of the potential for future exports growth in each.

Have the Mayor and LEP identified the main opportunities that London businesses could take advantage of in the climate change adaptation sector?

One of the findings of the Committee on Climate Change's assessment was that although this sector had grown in the UK – both absolutely and relative to the rest of the economy – other countries had seen faster growth than the UK. Japan, France, Russia the United States, Italy, Brazil and Germany were all highlighted as countries with stronger adaptation sector growth than the UK between 2009/10 and 2011/12.⁴⁵

In London, the total size of the climate change adaptation sector has been estimated to have a turnover of £431 million, and to employ around 4,000 people (2011/12 figures).⁴⁶ The Greater London Authority and London Climate Change Partnership are currently undertaking a project to assess the value of the adaptation sector in London, and to identify interventions that are required to help boost it.⁴⁷

London has particular strengths in this area, which can be exploited globally. Daniel Dowling of PwC focused on design and engineering and consultancy services:

How can the Mayor and London & Partners support the climate change adaptation sector to prosper in London?

London can help to seize the opportunities of managing climate change by leveraging its internationally recognised skill base in design and engineering services. Our water sector, along with the energy generation and transmission companies and technology developers have already made good progress on adaptation. So, together with our wider advisory and professional services capabilities, we can help other cities or countries build their resilience too.⁴⁸

Meanwhile, Simon Howard of UKSIF focused on financial services, and suggested the Mayor could support this work:

We are the second-largest responsible and sustainable finance market in the world after the United States. We are Europe's largest. We have strengths in it. We should be looking to export them. I do think the Mayor has a role to play in this because kick-starting is needed and pump-priming is needed.⁴⁹

Appendix 1 Climate change stress test for the London economy

How are the Mayor and London Enterprise Panel incorporating climate change risks into their economic strategies for London?

To what extent have London businesses identified the major risks in their supply chains?

What steps can be taken at a London-wide level to help map the supply chain dependencies of the city's economy?

What is the scale of the risk facing investors based in London, in relation to their exposure to a fall in the value of carbon investments?

What are the risks and opportunities of the fossil fuel divestment movement for London, and how can these be managed?

How can London address an apparent shortage among the workforce of skills needed for climate change adaptation?

To what extent have businesses in London taken necessary steps to identify climate change risks and develop adaptation plans?

Have the Mayor and LEP identified the specific challenges faced by smaller businesses in addressing climate change risks?

How can the Mayor and LEP monitor the uptake of adaptation measures across the London economy?

What further support needs to be provided to smaller businesses, and who should deliver this?

How can financial services companies support other businesses to address climate change risks?

Have the Mayor and LEP identified the main opportunities that London businesses could take advantage of in the climate change adaptation sector?

How can the Mayor and London & Partners support the climate change adaptation sector to prosper in London?

Appendix 2 References

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- ³ United Nations Environment Programme, *The Emissions Gap Report 2010*, 2010; PwC, *Two degrees of separation: ambition and reality: Low Carbon Economy Index 2014*, 2014
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Appendix 3 Views and information

In order to assess the climate change challenge for London's economy, the Committee has taken a number of steps. We have reviewed the evidence published by governments, businesses, research institutes, campaigners and others. The Committee has received submissions directly from a range of organisations. We have also held two public hearings on this topic, hearing from a range of experts and stakeholders from different fields.

Guests at the Committee's meeting on 24 June 2014:

- Nick Beecroft, Lloyd's of London
- Daniel Dowling, PwC
- Professor Samuel Fankhauser, Grantham Research Institute on Climate Change and the Environment, London School of Economics and Political Science (LSE)
- Professor Christopher Rapley CBE, London Climate Change Partnership
- Juliette Daniels, London Climate Change Partnership

Guests at the Committee's meeting on 23 October 2014:

- Dr Outi Korkeala, Ricardo-AEA
- Simon Howard, UK Sustainable Investment and Finance Association (UKSIF)
- Mark Jenkinson, Siemens
- Tom Burke, E3G

Written submissions received from the following individuals and organisations:

- British Property Federation
- City of London Corporation
- Cross River Partnership

- Environment Agency
- Kent County Council
- Ashley Kingsborough and Professor Jim Hall, Environmental Change Institute, University of Oxford
- Marks and Spencer
- National Centre for Atmospheric Science
- Dr Swenja Surminksi, Grantham Research Institute on Climate Change and the Environment, London School of Economics and Political Science (LSE)
- Team London Bridge
- Technology Strategy Board

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