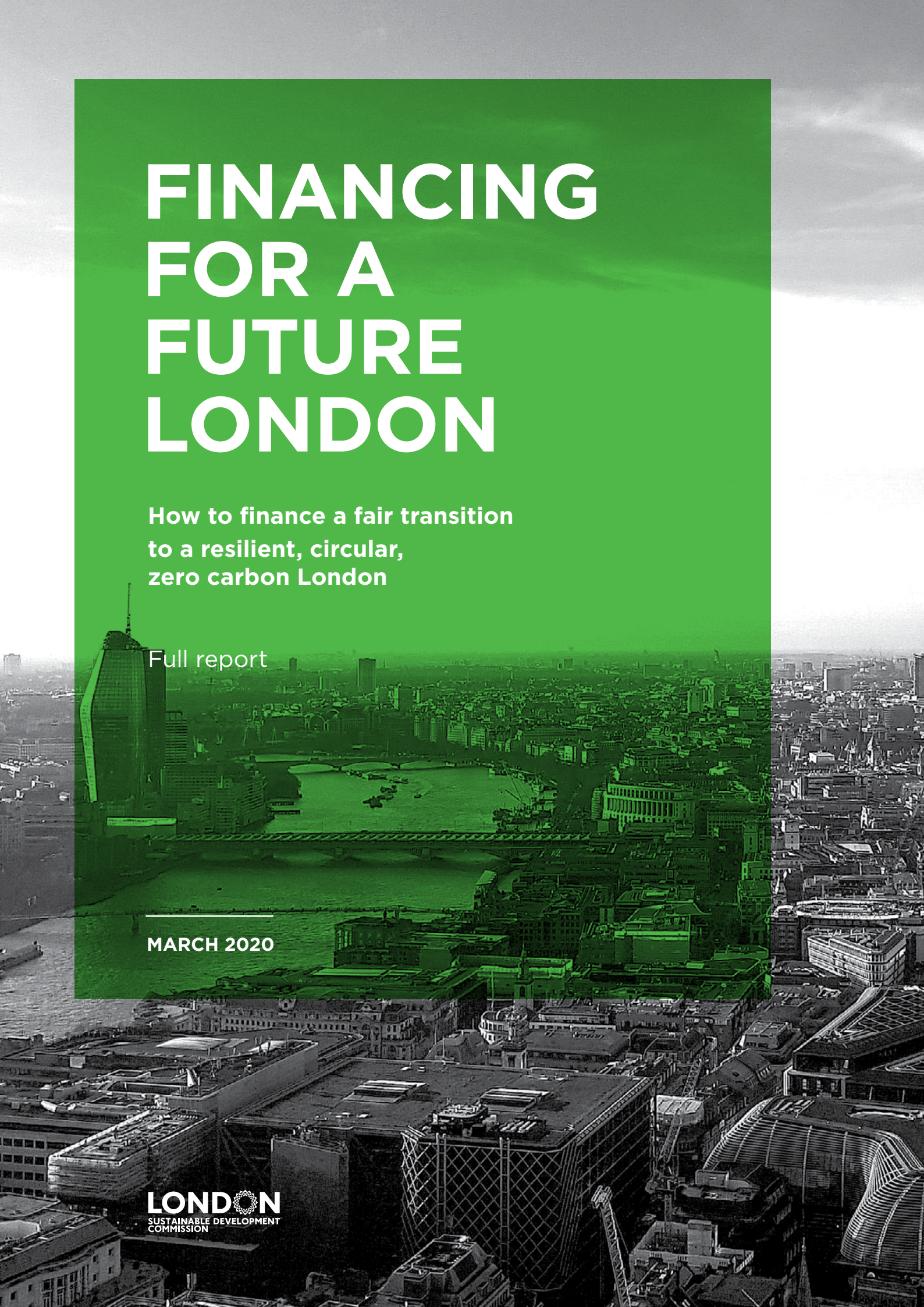
FINANCING FOR A FUTURE LONDON

How to finance a fair transition to a resilient, circular, zero carbon London

Full report

MARCH 2020



LONDON SUSTAINABLE DEVELOPMENT COMMISSION

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Background

LONDON SUSTAINABLE DEVELOPMENT COMMISSION

The London Sustainable Development Commission (LSDC) was established in 2002 to provide independent advice to the Mayor of London on ways to make London a sustainable, world-class city. The Commission is an independent body, challenging policymakers to promote a better quality of life for all Londoners, both now and in the future, whilst also considering London's wider global impacts. The Commission is made up of individual experts from the economic, social, environmental and London governance sectors. Commissioners give their time voluntarily, promoting sustainable development, embedding sustainability into London-wide strategies, and helping make sustainability a meaningful and understandable concept for all Londoners.

UK100 were commissioned by the LSDC to undertake the first stage of the Green Finance work programme.

UK100

UK100 is a highly ambitious network of local government leaders, which supports decision-makers in UK towns, cities and rural areas in their transition to 100% clean energy by 2050. It is the only network for UK local authorities focused solely on climate and clean energy policy. UK100 connects local leaders to each other, to business and to national government, enabling them to showcase their achievements and learn from each other. It enables them to speak collectively on how to accelerate the transition to clean energy locally and nationally.

> *"And like virtually everything else in the response to climate change, the development of this new sustainable finance is not moving fast enough for the world to reach net zero.*
>
> *To bring climate risks and resilience into the heart of financial decision making, climate disclosure must become comprehensive; climate risk management must be transformed, and sustainable investing must go mainstream."*

Mark Carney, Governor Bank of England
UN Climate Summit, General Assembly,
Monday 23 September 2019[1]

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Foreword - Financing London's Future

The Mayor of London, Sadiq Khan has declared that our city and the world faces a climate emergency. This declaration, echoed by most of London's boroughs, is a welcome signal that there must be a redoubling of London's efforts to avoid the societal collapse facing humanity unless the twin threats of global heating beyond 1.5°C and human-driven ecosystem collapse are averted.

As well as leading London's evolution into a zero carbon, circular economy that works for all, the Mayor is responding positively to the mass upwelling of public outrage at the climate and ecological crises – from the school strikes to street protests. It is increasingly the case that not just today's but tomorrow's voters will demand decisive action from the holder of London's top job to decarbonise our city.

The Mayor has already championed a route-map towards this goal, increased the GLA's investment in multiple renewable energy and energy efficiency schemes, and is pursuing economic strategies for socially and environmentally "good" growth.

The Mayor recognises that the only way to have a sustainable, strong, high skills and high employment economy in London is to decarbonise and circularise; his strategy suite breaks from the past in raising the bar and pursuing full policy integration and coherency.

Yet the Mayor does not have the devolved powers needed to fulfil his ambitions, and the level of ambition that everyone who succeeds him must necessarily also have.

The direct spending power of the Mayor is several orders of magnitude less than that required to achieve a flourishing zero carbon economy. The scale of the just transition that must be effected - a decarbonisation pathway that facilitates greater inclusivity and reduced inequality - dwarfs anything any mayor of London could achieve on current powers alone.

The magnitude of investment that is commensurate with the task ahead will only be delivered if the vast amount of private capital flowing through London forms the bulk of it - instead of financing the largely business-as-usual development London is now seeing and will continue to otherwise see.

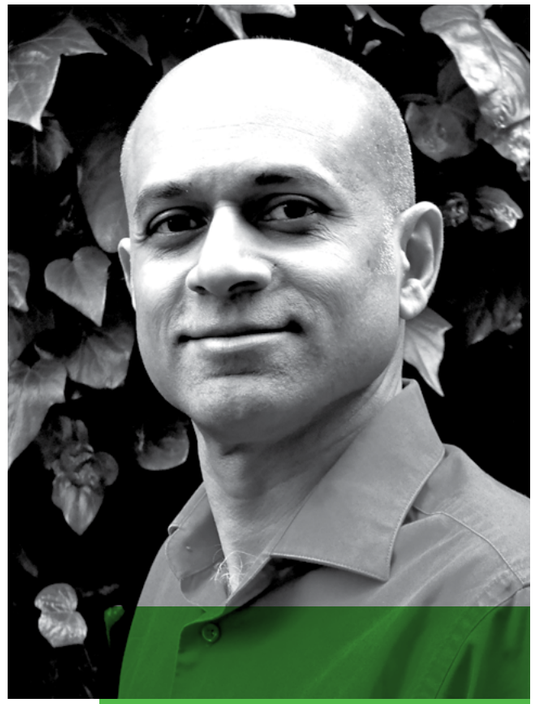
To compound the problem, such green finance flows as are issuing from the City are largely contributing to decarbonising other metropolises across the world rather than our own. This is perverse and will lead to London conceding a global leadership role unless reversed.

Furthermore, despite the Government's welcome acceptance of the Committee on Climate Change's recommendation that we raise the bar to full decarbonisation (rather than an 80% cut) by 2050, now enshrined in legislation, there currently remains little chance that the next two national carbon budgets will be met, as the CCC has also warned. This puts an even greater onus on London and City to rise to the challenge of unblocking and creatively channelling at-scale green finance flows. Not only that, but this must be effected in a manner that reduces inequality and increases opportunity, not least because London is home to some of the UK's most disadvantaged communities.

The LSDC believes there is an opportunity to invest taxpayers' money effectively to increase the scale and quality of green finance in London, and in doing so leverage open much larger private capital flows – but only if London is given the devolved financial capacity to do so as well as having the regulation and fiscal mechanisms put in place to create demand. We also believe that this can be done in a manner that brings real social as well as environmental benefits.

Based on our research – drawing extensively on the experiences of those who have been involved in the most successful large scale green finance initiatives in the UK and abroad - the LSDC is proposing a precise pathway that will prove London's effectiveness in delivering socially just decarbonisation, and hence make a powerful case for our city to be granted substantial devolution to invest further. To underscore, these devolved funds are necessary to scale up direct public investment; but much more importantly they would facilitate necessary large-scale private investment – £1-1.7 trillion - by the City and other investors.

We have spent 18 months determining exactly how this can be done, as described in this report. If undertaken, the course of action we propose could well be the single most important intervention on climate change in the UK since the creation of the Climate Change Act. It would be an historic act, of globally significant proportions. It would give London – and the UK - all the first mover advantages of large-scale green investment. And it would be an effective and just way to respond to the exigencies of the climate emergency.



Dr Ashok Sinha

Chair, London Sustainable Development Commission

Executive Summary

1.1 WHY LONDON, WHY NOW?

London can claim with considerable justification to have taken the boldest practical stance on climate change of any city in the UK.

- Successive mayors have championed a route-map towards the decarbonisation of London that has seen increased investment in multiple renewable energy, district energy and energy efficiency programmes.
- The current Mayor is pursuing economic strategies for socially and environmentally "good" growth that recognises the only way to have a sustainable, strong, high skills and high employment economy in London is to decarbonise and circularise[2]. London's **strategy suite breaks from the past** in raising the bar and pursuing full policy integration and coherency.
- The Mayor's recent declaration of a **climate emergency** signals his intention to lead a redoubling of London's efforts to avoid the societal collapse facing humanity unless the twin threats of global warming beyond **1.5°C** and human-driven **ecosystem collapse** are averted.

Yet the Mayor does not have the devolved powers needed to fulfil his ambitions.

- The **direct spending power of the Mayor is several orders of magnitude less than that necessary** to achieve a zero carbon economy for the capital. The scale of the just transition that is needed - a decarbonisation pathway predicated on inclusivity and equality - dwarfs anything the Mayor can achieve with his current powers and funding alone.
- The magnitude of investment needed will only be delivered if the vast amount of **private capital** flowing through London forms the bulk of it - instead of financing the largely business-as-usual development London is now seeing and will continue to otherwise see. Considerable funding will be needed to regenerate areas; improving our natural environment and the existing building stock whilst developing smart, clean and integrated energy and transport systems. London is already and will continue to see significant amounts of investment going into its infrastructure. This will continue over the next 30 years. We need to shape this finance to make sure it actively supports the net zero goals.
- Such green finance flows as are issuing from the City are **largely contributing to decarbonising other cities across the world rather than our own**. This is perverse and will lead to London conceding a global leadership role unless reversed. The finance sector also needs to rise to this challenge and develop new and innovative business and investment models that respond to the specific requirements of environmental projects and the demands of a new economy, one that is low carbon and circular.

Meanwhile, **the UK Government's efforts to channel finance into decarbonisation have stalled** – including the privatisation of the Green Investment Bank. And there is currently little chance that the next two national carbon budgets will be met, as the Committee on Climate Change (CCC) has warned. In parallel, the **pressure from civil society and activist organisations will only grow** for the Mayor to take action, commensurate with his declaration of a climate emergency, ahead of the 2020 Mayoral contest.

The Mayor has shown, rightly, that he will be interventionist. The LSDC believes he has an opportunity to demonstrate that, **in contrast to central government**, he is willing to invest public money effectively and leverage much larger private capital flows – if given the devolved financial, operational and regulatory capacity to do so. Doing so will also constitute a commensurate response to the Mayor's declaration of a climate emergency.

Based on our research, the LSDC is proposing a **potential pathway** for the Mayor and other key stakeholders, such as the boroughs, to follow that will **prove London's superior effectiveness in delivering socially just decarbonisation**. This will help make a **powerful political case to central government to win substantial devolution of national spending.** These funds will allow the scale up of direct public investment, but more importantly they will help unlock the necessary large-scale private investment – £1-1.7 trillion that is needed from the City.

"The LSDC is proposing a potential pathway for the Mayor and other key stakeholders, such as the boroughs, to follow that will prove London's superior effectiveness in delivering socially just decarbonisation."

We have spent 18 months determining exactly how this can be done, as well as creating an evidence base that has also been published. This evidence base will then be available to politicians, local authorities, financial institutions and any other stakeholders who wish to rise to the challenge.

In this paper and longer evidence report, we lay out our proposal to create a **London Future Finance Facility** that covers:

- **Why** a new institution is needed?
- The **role** of our proposed new London Future Finance Facility.
- A **roadmap** to the establishment of the London Future Finance Facility.
- A package of specific **near-term programmes** to be facilitated.

1.2 THE ECONOMIC CASE FOR ACTION

As argued in the LSDC's responses to the London Plan and Mayor's Economic Development Strategy[3], the only way for London to have a sustainable, competitive and strong economy - one which generates exports of goods and services while attracting skills and finance - is to transition to a low carbon and circular way of doing business. This will render London more prosperous, innovative and productive as well as cleaner, greener and more inclusive.

- The London Infrastructure Plan (2015) says up to £1 trillion of investment will be needed to fund new infrastructure by 2050, regardless of whether it is clean or dirty. This huge sum must be channelled appropriately to ensure London remains competitive in the global economy and resilient to the impacts of climate change and other city-level pressures.
- Green finance cannot sit alongside 'mainstream' business-as-usual investment. **All infrastructure needs to be climate-proofed** and designed and operated as a smart, integrated and sustainable system, one that provides huge productivity, resource efficiency and quality of life gains to the city and its citizens.
- The City of London is helping to decarbonise other cities across the world rather than our own. London is already losing its competitive edge, according to a recent UNEP report[4]. **Delay or failure to act decisively will put businesses off locating to London and redirect finance to other cities**. Setting up the Green Finance Institute is a good start.
- Sustainable growth policies will **relieve the impacts of historic unsustainable urban growth** – e.g. air pollution, congestion, public transport overcrowding and ill health - as well as stimulating innovation, growth and wellbeing. The tax base will expand, through higher incomes, profits and capital appreciation; and expenditure on health and social security will fall.

Effecting the transformation to a sustainable economy is a multi-faceted challenge. But at the heart of this is the financing challenge. We address this next.

"Our city can make an historic global contribution by designing new and innovative financing solutions that respond to the needs of environmental projects that support a socially inclusive approach to climate transition and are able to attract this investment."

1.3 LONDON'S SUSTAINABILITY FINANCING CHALLENGE: THE CASE FOR A NEW INSTITUTION

The LSDC's research shows that London is currently unable to invest in the right infrastructure at sufficient scale to secure its future as a leading global city in a climate-changing world. This puts its people and economy at risk, as well as rendering the achievement of its long-term decarbonisation targets impossible.

Yet London has the world's leading expertise in sustainable finance, with major London-based investors actively looking for new long-term opportunities. Our city can make an historic global contribution by designing new and innovative financing solutions that respond to the needs of environmental projects that support a socially inclusive approach to climate transition and are able to attract this investment. There is a clear challenge in scaling up and de-risking potential projects to create a sustained pipeline that can attract at-scale, long-term low cost, finance. A new agency could potentially help to accelerate the identification, development and aggregation of investment ready projects across London, similar to the recently set up London Housing Bank and other institutions across the world[5].

HM Treasury is currently consulting on how to replace the current discredited UK Public Private Partnership (PPP) system, including the National Infrastructure Commission's (NIC) proposal of a UK National Infrastructure Bank[6]. This gives London the chance to make a **forceful case for more public funding and more autonomy** over financing coupled with the provision of additional powers. A key element for making this case will be **proving that London has the capacity, skills, influence and institutional structures to scale up investments to the necessary levels in a financially responsible and efficient manner**.

The LSDC has identified three core barriers that must be overcome:

- **Fragmentation of Capacity and Funding** between the GLA and boroughs means there is a lack of co-ordination, capacity and skills to develop sufficient financeable projects; just delivering the energy projects needed in the next five years alone is likely to require 5-10 times more annual development funding. Fragmentation also reduces the ability of the GLA and boroughs to come together and create aggregated project portfolios that are able to tap into the large pools of institutional capital in London seeking green investment opportunities which require minimum investments of £50-100 million.
- **Fragmentation of Infrastructure and Ownership:** the new integrated system-based solutions required do not map neatly on existing infrastructure sectors of electricity, gas, water, waste, transport and flood defence and often have multiple owners. Delivering a zero carbon London requires innovative facilitation of integrated investment across a number of relevant utilities and stakeholders.
- **Fragmentation of Value:** many green investments bring multiple environmental and social benefits that are not captured in current financial systems. Energy-efficient and warm homes improve health, lower poverty, create good local jobs and lower local pollution as well as reducing carbon emissions. Too often investment of public sector funds is constrained by a systemic siloed straight jacket, leaving them unable to combine funding streams and deliver integrated projects that can deliver the optimum outcomes.

The conclusion of the LSDC's research is that incremental reforms, though useful in the short term, are not adequate to overcome these barriers. **We therefore propose that the Mayor develops a major new institution to help deliver the future investment that London needs: with a working title of the London Future Finance Facility**.

Crucially, the London Future Finance Facility would not only **demonstrate how these barriers could be overcome** but would **prove the case for why London needs to be given greater autonomy with responsibility for city-wide operations and performance alongside the devolution of its finances so that it is able to invest at sufficient scale to leverage investment from the City at the level needed to decarbonise London**.

1.4 DEFINING THE ROLE OF THE LONDON FUTURE FINANCE FACILITY

1.4.1. Four Priority Objectives

The mission of our proposed facility would be to deliver the investment London needs to decarbonise and thrive in a climate-changing world. Uniquely, it will have a focus on delivering a just transition supporting disadvantaged communities and creating jobs for all. This mission would be expressed through four priority objectives:

1. Securing of a flow of investment that responds to the development and investment needs of environmental projects by the mid-2020s which is of sufficient **scale and nature** to create and, then, invest in a pipeline of environment projects, ultimately in line with London's 1.5°C trajectory.
2. Ensuring all parts and communities of London enjoy the benefit of its activities as a contribution to **'inclusive growth'**[7] **and the transition to a low carbon circular economy**.
3. Supporting London to become ***the* global centre** for the "low carbon circular economy".
4. Demonstrating the **efficiency, effectiveness and social value** of integrated climate and environmental financing, helping to prove this new approach to investing at a spatial level and helping it to become the new normal.

1.4.2. Four Distinct Pillars

The London Future Finance Facility would be rooted in new and innovative "green banking" practices responding directly to the specific needs and risk profiles of green projects. It will need to learn from and build upon the activity and learnings of the Mayor's Energy Efficiency Fund (MEEF) and reflect on the legacy of the UK Green Investment Bank. It would have **four distinct functional pillars**:

1. **London Future Finance:** a green/sustainability banking facility to offer bespoke financial instruments for clean and resilient investment. It would:
   - **Develop de-risking** instruments.
   - Aggregate smaller projects into **financial bundles both for financing** and efficient refinancing.
   - As the pipeline and ownership structures materialise it will look to issue green/sustainability/resilience **bonds** to tap into the deep pools of institutional finance in London.
   - **Work to pool and leverage** different public funding streams such as the Public Works Loan Board, the Municipal Bonds Agency and MEEF.
   - As city infrastructure project pipelines develop explore the opportunity to raise finance for them through mechanisms such as **"citizens' green bonds" or 'crowd source funding'** to enable Londoners to invest directly in and share the benefits of their city's transformation.
2. **London Future Infrastructure:** a specialised project and programme development unit providing capacity to support boroughs, utilities and other London institutions in developing a pipeline of bankable mitigation and adaptation infrastructure projects.
3. **London Future Jobs & Communities:** create clear links with the Mayor's Economic Development and Skills team to help ensure activity undertaken by the facility supports a "just transition" by ensuring projects that benefit traditionally excluded groups and communities are supported and local job and supply chain opportunities are maximised.
4. **London Future Markets:** create clear links with the Mayor's policy teams to help ensure activities supported by the LFFF accelerate the development of sustainable markets for clean technologies, helping to provide market pull that will underpin the growth of the cleantech industries of the future – not just in London but across the UK.

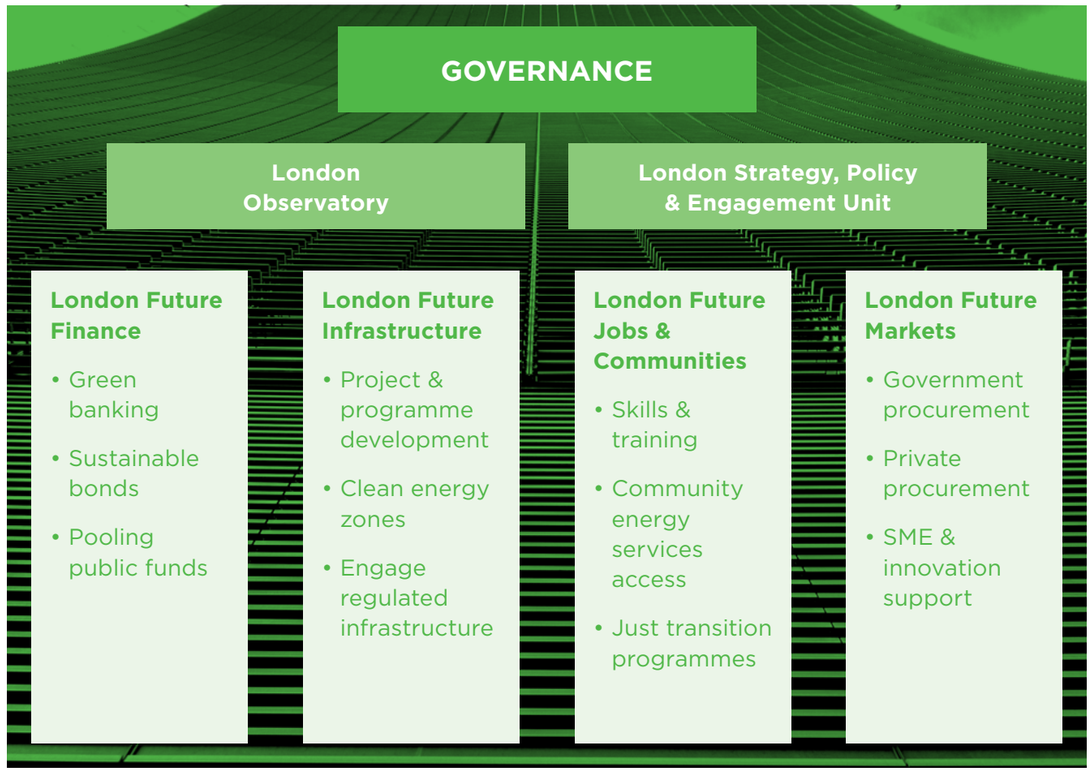


Figure 1: *The four pillars of the proposed London Future Finance Facility*

1.4.3. Two Horizontal Functions

These four pillars would be complemented by two horizontal functions that could take the existing Energy for Londoners structure and evolve it so that it was set-up to help ensure a joined-up approach and integration with wider national and London policy and programmes:

- **London Observatory:** generating a real-time and comprehensive overview of London's existing and future integrated infrastructure system needs and capabilities (financing, operations, companies, supply chains etc.) that will be required to be consistent with a 1.5°C future.
- **London Strategy and Policy:** a small unit focused on strategic integration of the activities of the London Future Financing Facility ensuring consistency across the four pillars, engaging with GLA policy teams and engaging with central government and regulators to make the case for specific devolved powers, national regulatory reforms and the re-allocation of funding to London to meet its investment priorities.

Examples exist of all the functional elements described above; however, their combination into one integrated facility would be a **global first**. We contend that **only a new institution of the scale and ambition of the London Future Finance Facility can unlock the resources needed to address London's environmental challenges whilst helping to meet London's triple challenges of growth, inclusion and environmental sustainability**.

Based on discussions with those involved in developing comparable institutions around the world **the LSDC suggests that London is well placed to develop an institution of the scale and scope of the London Future Finance Facility**, given the scale of the London market and the depth of wealth, capacity and opportunity in London.

The LSDC does not believe that the London Future Finance Facility needs to be delivered tomorrow, but it does need to be operational in the early 2020s if London is to address the climate emergency.

In the next section, the LSDC lays out a practical but ambitious approach to delivering immediate change based on existing institutions while laying the foundations for a step change in the quantity and nature of investment that could be supported in the early 2020s.

1.5 NEAR-TERM ACTIONS

Successfully delivering the vision of the London Future Finance Facility will depend on three key factors:

- The **support of the Mayor of London** for this bold and innovative approach.
- Partnership with a **critical mass of boroughs** such as those that have declared a climate emergency[8] who would explore pooling resources in appropriate areas with the GLA to drive strategic and cross borough projects and infrastructure.
- Ability to further **pool human and financial resources** across the GLA and London whilst gaining access to significant new national public funding sources as they become available.

This report has identified several practical steps which the GLA could implement immediately to lay the foundations for the London Future Finance Facility and make a strong case for more money and powers being transferred from central government.

- **Funding – Working with boroughs to ensure that the Mayor's London Plan zero carbon planning policies are fully implemented, and carbon offset payments are fully secured**
  The GLA should build on its existing work with boroughs and support them to ensure that they are equipped to ensure that London Plan policies for zero carbon homes (to be extended shortly in the revised 2020 London Plan to all new development in London) are applied to all relevant applications; and that any emission shortfalls are balanced with developer carbon offset payments. In addition to financing local carbon reduction projects, securing such funding would also allow boroughs to fund new staff to undertake a borough-wide decarbonisation plan that would identify, develop and deliver new carbon reduction projects to respond to the climate emergency and get to zero carbon by 2050 (or indeed earlier given many boroughs have declared climate emergencies).
- **Institutional Support - A new unified and integrated institution to drive action on low carbon energy across London**
  Current GLA programmes for decarbonising London mainly focus on development of district energy and on energy efficiency in public buildings and social housing with the intention to expand into the private rental and owner occupier sectors for residential buildings. These will need to be expanded into other sectors e.g. commercial and industrial buildings and other areas e.g. waste, transport, adaptation and green infrastructure, over time. Research undertaken over the course of the LSDC's study leads us to propose that the GLA considers forming a new single 'Delivery Unit' that merges the roles of DEEP, RE:FIT and RE:NEW, MEEF and potentially other GLA energy related programmes to bring together the funding, finance, skills, support and delivery mechanisms for a low carbon London under one roof with a clear and coherent brand.

- **Explore pooling carbon offset funds for cross-borough strategic programmes.**
  Consideration should be given to the concept of the GLA and London's boroughs pooling at least a proportion of their carbon offset funds. This could support the establishment of a pan London fund to help develop and finance strategic low carbon energy infrastructure. This fund could then be used, either as a grant or an investment, in conjunction with MEEF to finance projects identified by Energy for Londoners or the new Delivery Unit when established. An approach such as this could enable large, cross borough schemes like district heat and cooling networks to be financed.

1.6 ROADMAP TO DELIVERING THE LONDON FUTURE FINANCE FACILITY

We propose a roadmap to the development of a full London Future Finance Facility as follows:

- **March 2020:** As a core element of his response to the climate emergency the Mayor announces in principle support for considering the LSDC proposal for a London Future Finance Facility and commitment to establish a taskforce of financiers, boroughs and experts to consider the LSDC's recommendations and deliver a detailed design and plan for the LFFF by December 2020. This will include linking to national work such as the Government's Green Finance Strategy and HMT Zero Carbon Review[9].
- **Mid 2020:** Green Finance Taskforce is established by the Mayor and starts work.
- **Q2-Q3 2020:** Taskforce will work with boroughs, utilities and private financial institutions, as well as engaging with central government, to explore potential joint resources and other funds that could support development and delivery of projects, including relevance of devolution of powers and finance. This could include investing in or alongside MEEF as a starting point.
- **Q4 2020:** In time for Glasgow COP26, a recommendation report to be published by the taskforce covering key barriers – and how to overcome them - to delivering large-scale carbon reduction programmes and raising finance for them, the structure of a new institution and how that new institution could address these issues.
- **2021:** Decision taken by the Mayor on detailed design and establishment of London Future Finance Facility based on taskforce report. Engagement with central government on core funding as part of future spending reviews for establishment in the early 2020s and establish a mechanism for accessing "London's share" of national climate change related funding streams, for activities around heat, energy efficiency, electric vehicles, clean energy etc.
- **2022:** The facility begins operating by incorporating existing funds from a combination of public and private sector sources. It begins to implement a 3-year business plan to scale up investment and activity across both public and private sectors to meet London's carbon budget for 2028-32.

2

Introduction

THE LSDC VISION

The LSDC has been working closely with the GLA and other stakeholders to identify and promote the actions needed to create demand for low carbon projects and options to finance these and wider environmental programmes in the capital, such as flood risk management, green sustainable urban drainage (SuDS) and green infrastructure improvements. The work has involved a series of roundtable events with experts and stakeholders on barriers to increasing green finance followed by a solutions workshop. UK100[10], were commissioned to produce additional evidence that has been used in this route map report.

This report focuses on the objective of decarbonising London to illustrate the issues around rapidly scaling green finance, which are also needed in other areas such as climate adaptation, flood protection, the natural environment and the innovation pipeline. The investment challenge London faces is outlined; the existing zero carbon activity; and the funding and finance landscape for it are explored. The challenges to growing green finance are described before finally concluding with a series of short, medium and long term solutions that form a route map and recommendations for how these challenges can be overcome and at a sufficient scale and speed of investment delivered to ensure London not only meets its zero carbon commitment by 2050 but at the same time delivers a sustainable and inclusive London that is in line with the Mayor's Good Growth for all approach (see Box 1).

Box 1: DELIVERING GOOD GROWTH FOR LONDONERS

"Good Growth" focuses on delivering positive outcomes for Londoners. It relies upon the alignment of levers - projects, policies, priorities and funding - across the Mayor's strategies and programmes and taking the opportunity to consider how these can deliver the best outcomes. This includes building strong and inclusive communities through carefully planned development, creating opportunities for all Londoners to benefit from growth through regeneration projects and growing a good economy that supports job and business growth.[11]

London is growing and expected to be home to 11 million people by 2050[12]. London is the fifth wealthiest city in the world by GDP, yet 27 per cent of its citizens live in poverty and homelessness continues to rise[13]. All Londoners need to share in London's growth and have good quality jobs and homes. A healthy environment is needed to maintain and enhance Londoner's quality of life and well-being. New homes need to be built urgently. New sustainable transport, energy, water, data, flooding and green infrastructure will need to be developed to support London's growing population. Existing infrastructure, homes and buildings will also need renewal to meet 2050 needs.

These are not the only challenges London faces. London is committed to being a zero carbon city by 2050 – the evidence for this commitment is compelling[14] and action is needed urgently. London is responding and leading the way with its recently published Zero carbon London: *A 1.5°C compatible plan*[15], building on the commitments of the 2018 *London Environment Strategy*[16]. In addition, the impacts of climate change and the need for the city to adapt to a changing climate are also a challenge that London faces. London's climate is changing, with extreme weather events expected to increase in frequency and severity to 2050 and beyond.

The scale of the challenge is huge – no less than requiring the rebuilding and refurbishing of much of London's infrastructure and buildings by 2050. London has choices to make on how to do this and these decisions are needed now. The infrastructure being designed, commissioned and built now needs to be fit for purpose for the challenges of 2050. Carbon emissions need to be eliminated, homes and offices need to be warm in winter and cool in summer without adding to carbon emissions – ready for the more regular extreme heat events forecast. Flood defences need to be ready for more extreme weather and tidal events. We need healthy streets that encourage people to walk and cycle, with less congestion and air pollution. We also need to shift quickly to zero carbon and zero emission vehicles, public and freight transport and the infrastructure that enables them[17].

The projected capital expenditure required for London's future development is staggering. The London Infrastructure Plan estimated the investment needed in infrastructure to meet the demands of a larger population by 2050 as £1.3trillion[18]. But the issue is not whether to invest or not in infrastructure. London must invest in its infrastructure to support the economy and Londoners. The risks and costs of failing to invest mean the question really is how can we ensure we drive the right scale of investment into sustainable projects and infrastructure that meet the needs of London now and in 2050. Yet the current level of investment is far too low to deliver the speed and scale of change required. Greater and sustained levels of finance needs to be delivered to support London's infrastructure.

This report outlines how green finance solutions must be developed to support the speed and scale of delivery required in the Mayor's Environment Strategy and a pipeline of projects. It focuses on the objective of decarbonising London to illustrate the issues around rapidly scaling green finance. While the focus is the challenge of financing a zero carbon London, green finance is needed for wider adaptation, environmental and sustainability challenges such as flood risk management, green sustainable urban drainage systems (SuDS), financing the cleantech innovation pipeline and other green infrastructure that require investment.

London is a global market leader in international carbon finance, but all too often this is not about creating opportunities for delivering financial products for green projects within the capital itself. While the two are indeed related, with early evidence suggesting they are mutually supportive, initiatives already exist that fulfil such a role, including the Green Finance Initiative. However, it should be noted that the 2017 UNEP report[19] argued that London is losing out to Paris and Frankfurt because there is a much smaller local pipeline of projects to generate local expertise and investment which could be financed by a facility such as a climate finance accelerator[20].

Box 2: WHAT IS GREEN FINANCE?

In this report 'green finance' refers to the provision of finance to support the delivery of London-based projects with environmental or wider sustainable development outcomes as their primary objectives, at a scale consistent with the Mayor's environmental goals.

It may consider the role of grant funding, but the work is primarily about identifying the types of public or private investment finance from companies or organisations, usually in the form of debt or equity, that is, or could be made available, to deliver environmental programmes at scale across London. This includes finance for use in both the development and capital funding stages, and seed capital to leverage private investment.

Development funding refers to funds to develop the project from conception through feasibility and business case to early commercialisation. This creates a pipeline of bankable or investable projects that are ready to take to market for financing.

Capital funding is that required to finalise the commercialisation phase and then actually physically deliver the project (Capex). This provides the pipeline of projects above with the investment required to deliver them.

THE BROADER POLICY CONTEXT

For any of the capital projects needed to deliver a zero carbon London a strong set of policies are needed to create a stable policy environment that will give assurance to investors. There are a number of national policies and objectives beginning to emerge relevant to green finance, which London has a central role in delivering.

The UK Government's 2017 Industrial Strategy[21] and Clean Growth Strategy[22] aim, respectively, to maximise the advantages for UK industry from the global shift to clean growth, and decarbonising all sectors of the economy through the 2020s. Both strategies are clear that this is an opportunity for the UK – 'one of the greatest industrial opportunities of our time' with the clean economy possibly growing at four times the rate of Gross Domestic Product (GDP). The Industrial Strategy highlights the need for the 'reallocation of trillions of pounds of public and private finance towards the pursuit of 'cleaner growth' and the desire to 'make the UK the global standard-setter for finance that supports clean growth'. **The LSDC believes that London can develop the actions and mechanisms to deliver these aspirations**. The Clean Growth Strategy sets out the 'first steps' to develop the green finance sector including the Independent Green Finance Taskforce report recommendations[23].

The Government's response to the Taskforce was published in July 2019[24], and its first action was to announce a new Green Finance Institute in London, which it also launched that month. This body is funded by government and the City of London, to help build and promote the UK as a world-leading centre for green finance. **London and the Mayor will have a key role to play ensuring the Green Finance Institute is not only located in London but also enables a flow of investment into projects in London. The Mayor will also need to take action to drive forward recommendations highlighted in this report such as Clean Growth Zones which require coordinated action across boroughs.**

Box 3:
THE GREEN FINANCE INSTITUTE[25]

"If we are collectively to meet our global climate goals we will need to mobilise $90 trillion by 2030 and it is my ambition that the UK leads the world in financing this investment."
Chancellor Philip Hammond
June 2018

As part of the 2018 Green Finance Taskforce report "Accelerating Green Finance" the first of many recommendations was to relaunch UK green finance under a new unified brand the response to which is the launch of the Green Finance Institute in July 2019.

The Institute is an independent company, led by bankers and seed funded by both the UK Government and the City of London Corporation. It is positioned as the principal interface between the public and private sectors regarding Green Finance in the UK and its mandate is to mobilise capital towards a net zero carbon and resilient economy.

The Institute's operating model brings together global experts from industry, finance, academia, civil society and government in coalitions that focus on identifying the barriers to green investment in the real economy and designing innovative financial mechanisms, combining both public and private finance to create viable investment opportunities and unlock capital flows – its initial flagship programmes are focusing on retrofitting and developing zero carbon homes, avoiding further deforestation from imported commodities such as palm oil and soy in supply chains and financing resilient infrastructure both domestically and in developing countries.

Through catalysing innovation and promoting education and awareness of green finance across the public and private sectors both in the UK and internationally, the Institute is playing its role in placing London at the heart of the global green finance movement.

Other key national agendas include the Government's 25 Year Environment Plan[26] and; the National Infrastructure Commission which was established in 2015 to provide central government with impartial, expert advice on major long-term infrastructure challenges[27]. The National Infrastructure Commission also addressed the issues of finance for infrastructure and highlighted the need for a combination of public and private financing and their complementary roles. Private finance is available, but state financing 'can help to encourage private investment and catalyse activities in new markets'[28].
The Commission raises concerns about the potential loss of access, through Brexit, to the European Investment Bank and the need to develop replacement institutions focused on infrastructure financing. The need for new local funding mechanisms for local authorities' infrastructure investment such as through zonal value uplift precepts on council tax is raised. **The Mayor has a clear role in catalysing activity in these three areas – the use of public funding to catalyse private finance, developing supportive new institutions and funding mechanisms and we return to these issues later in the report.**

Green Finance is also an international agenda and one that is developing fast. The International Network of Financial Centres for Sustainability (the FC4S Network), a partnership between the world's financial centres and the United Nations Environment Programme, highlights this rapid development. Globally, the number of sustainable finance policy measures has more than doubled since 2013, new markets for social and sustainability bonds are booming[29]. The FC4S Network reports on the diversity of green and sustainability activity taking place in its member cities.

"The National Infrastructure Commission also addressed the issues of finance for infrastructure and highlighted the need for a combination of public and private financing and their complementary roles."

Credit: National Police Air Service

3

Investing in London's future

BUILDING A LONDON READY FOR 2050 AND SUPPORTING 1.5°C

The Mayor has set London the ambition of becoming a zero carbon city by 2050. This is crucial to enabling the UK to meet its climate change obligations. The Mayor has set London the ambition of becoming a zero carbon city by 2050. This is crucial to enabling the UK to meet its climate change obligations. In June 2019 the UK became the first major economy in the world to pass laws to end its contribution to global warming by 2050. The target requires the UK to bring all greenhouse gas emissions to net zero by 2050, compared with the previous target of at least 80% reduction from 1990 levels, following the new advice of the Committee on Climate Change (CCC)[30].

The Mayor has already published an analysis on the scale of action that London needs to take to respond to the 'climate emergency'. *Zero Carbon London: A 1.5°C compatible plan*[31] which provides potential routes to how these targets could be delivered. Meeting London's next three five-year carbon budgets (as adopted by the Mayor in his May 2018 London Environment Strategy) requires immediate and large-scale action to improve energy efficiency and greater use of public transport and cycling. This needs to be accompanied by a significant increase in the electrification of heat and transport and an accelerated roll out of heat networks[32].

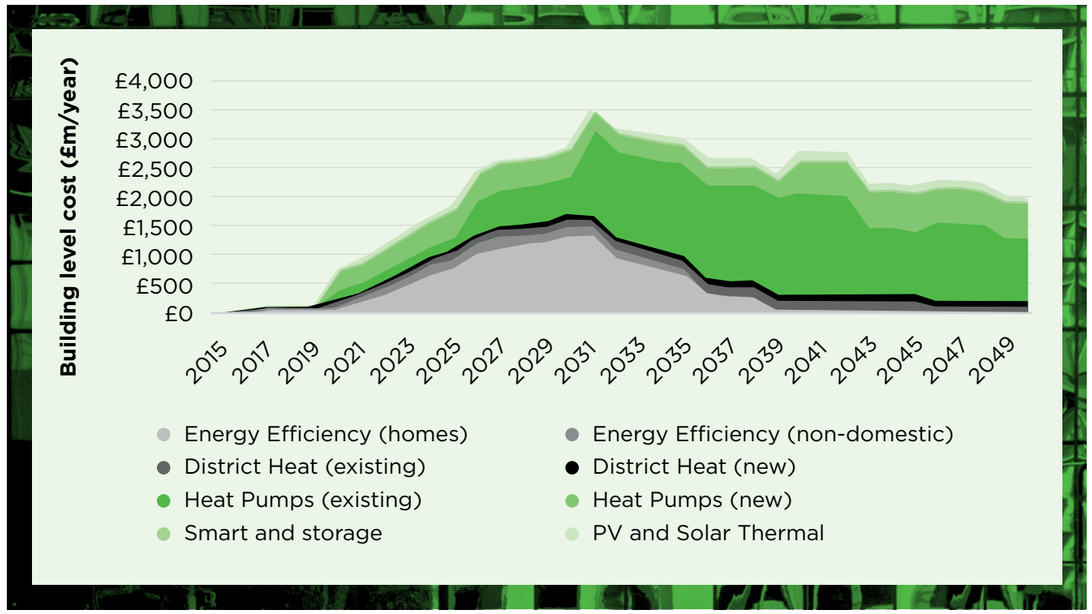


Figure 2: *Low carbon investment requirements required to deliver the 1.5 degree Climate Action Plan*[33]

Although the key actions that the Mayor and others need to take are set out in the GLA's study 'Zero carbon London: A 1.5°C compatible plan'[34], there are immediate short-term actions that can be taken which are needed as part of any of the future pathways to 2050. It is clear that, whatever route is taken, London's zero carbon pathway requires a huge investment in energy efficiency, heat pumps and district heat networks. These will need to be supported by investment in solar PV and solar thermal storage and smart technologies. It is estimated that buildings energy efficiency investment alone will require £10bn to 2050 – with a sharp ramp up from 2020.

The need to transition to a zero carbon economy and a changing climate is about much more than reducing our CO_2 emissions. London's challenges include the need to: improve air quality which affects the health of millions of people who live and work in the city; reduce flooding risk, to provide good quality homes which are warm in winter and, increasingly importantly, cool in summer and economic development that provides inclusive growth and jobs. These challenges can all be addressed in this transition.

We also need to transition to a new climate. Our infrastructure, new developments and existing buildings will need to be future proofed for our changing climate. That adds to the challenge but also means that there are opportunities that will bring multiple benefits, moreover, if we miss these opportunities we risk locking in bad decisions.

The shift to zero carbon will help London to transform the quality of its environment, communities and economy while building on its global reputation.

In addition, London's housing stock suffers from poor energy efficiency and many Londoners struggle to pay their energy bills. Investment in energy efficiency will help to reduce the 300,000 households[35] in fuel poverty in the city.

There is growing political consensus that zero carbon is not only compatible with economic growth but a driver of it. As already noted the UK Government's Clean Growth Strategy states that the UK low carbon economy could grow faster than the rest of the economy and could deliver between £60bn and £170bn of export sales of goods and services by 2030[36].

London is a key driver of the UK economy. It is home to a large number of world-leading businesses, universities and financial institutions that collectively have the capacity to ensure that it develops competitive advantages in the evolving clean energy economy. It can do this in partnership with expertise that exists elsewhere in the UK and abroad.

The switch from fossil fuels to clean energy sources, including how we power our transport, will require significant investment. Successful implementation will provide London with the knowledge and experience to export solutions to other cities around the world that face similar challenges.

FINANCING THE SCALE OF INVESTMENT NEEDED IN LONDON'S FUTURE

Globally, US$1.3 trillion per year of additional investment in clean energy infrastructure, low emission transport, energy efficiency (EE) and forestry will be required to limit global average temperature increase to 2°C. The scale of response needed and the resulting impact upon the global and domestic economies, entails the **transformation of the existing economic, social and institutional infrastructure** upon which city, national and international systems are based[37].

In the current economic context, countries face similar challenges in ensuring a rapid and smooth transition to low emission and climate resilient infrastructure and supporting economic growth. It is clear that limited public resources (both national and international) need to be used effectively in order to attract private capital at the scale required for the global transition to happen.

Due to the scale of investment required, development plans must result in programmes that attract investment from the private sector. This will be particularly important for transformation within some key sectors. London is increasingly conscious of the need to mainstream both low emission and climate resilience into its development plans and budgets and create opportunities for private sector investment and participation in these plans.

There is presently a mismatch between providers and recipients of climate finance, with a predominance of a "supply-driven" approach towards climate finance. The plethora of differing approaches towards climate finance create fragmentation of the international climate finance ecosystem, poses challenges for institutional readiness for climate finance and may hinder programming of climate finance for transformational impact as well as inhibit financial innovation. However it is not just the mismatch of finance mechanisms also a lack of understanding in the finance sector of the benefits, how to monetise them and ways to manage project risk.

The London Infrastructure Plan indicates that £1.3 trillion will be needed to be invested in London's infrastructure by 2050. The range of estimates is £1 to £1.7 trillion[38]. There are currently 138 strategic projects of £100m-£5bn to be completed by 2030[39]. Financing this investment presents many challenges but it is also an opportunity to build a London that Londoners want and need, addressing not only infrastructure delivery but the social and environmental objectives of London.

More recent analysis for the Mayor's Zero Carbon Plan, considers baseline investment against four different scenarios for achieving zero emissions by 2050. Cumulative discounted costs to 2050 are all similar and in the range £224-238bn (including fuel costs). Importantly, business as usual is not the cheapest option[40]. The scale of investment required to deliver this transformation to a zero carbon infrastructure should be noted. It is a significant proportion of the total infrastructure investment required in London - approximately 20 per cent.

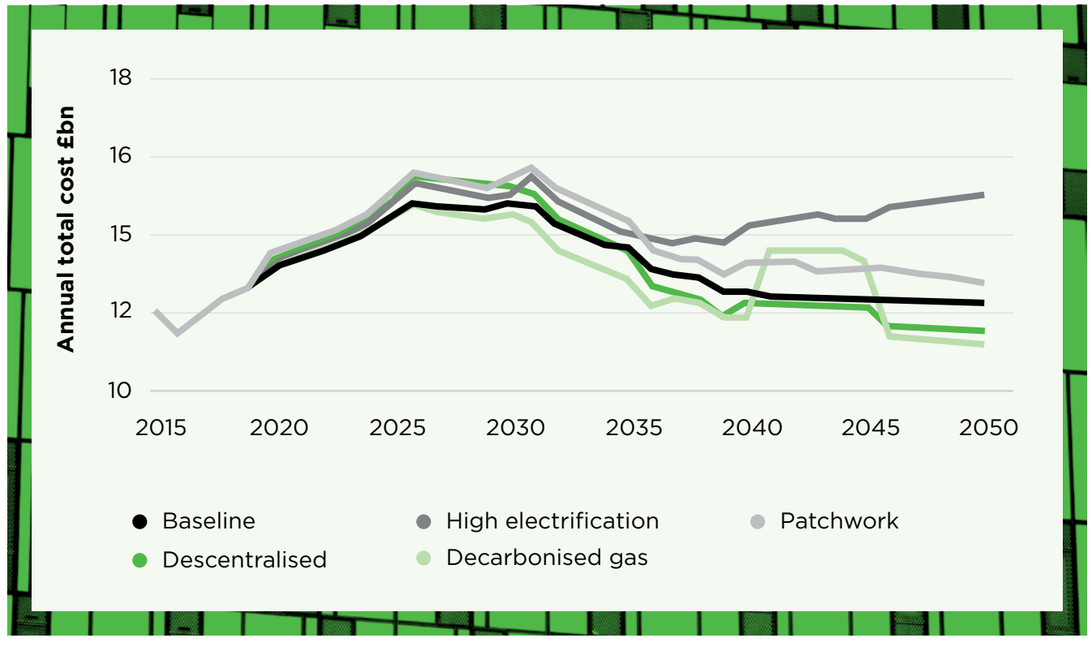


Figure 3: *Annual total costs to 2050 by scenario[41]*

"London needs to develop the projects that investors can invest in with the confidence that they will generate an appropriate return for the risks they are being asked to take."

It is clear from Figures 2 and 3 that a very significant scale of capital investment is required. **The London Infrastructure Plan analysis highlights a potential funding gap of £189bn** between what is required and what the public sector can provide. The higher investment highlighted in the Zero Carbon Plan are likely to widen this funding gap. Therefore, it is clear that private sector finance will be required in addition to public funding.

Whatever the study and the finance estimate required – it is clear that London requires major levels of investment over the coming decades to meet London's needs as a growing global city.

AN ACCELERATING ROLE FOR GREEN FINANCE

As a leading global financial centre, London's financial institutions are well placed to develop innovative financing solutions to financing the city's transition to clean energy and infrastructure. The need for action and opportunities for investment exist. But London needs to develop the projects that investors can invest in with the confidence that they will generate an appropriate return for the risks they are being asked to take. This will require a step change in how London develops, finances and delivers this investment over the period to 2030.

It is becoming increasingly clear that the issue is not a lack of green finance. The investment community is waking up to the opportunities presented by investing in clean energy and the risks of investing in heavily fossil-fuel dependent sectors. Outside of the UK, Norway's Sovereign Wealth Fund has recently declared its intention to divest entirely from coal producers and is reviewing its strategy in relation to oil and gas companies, as has the European Investment Bank. The World Bank, IFC and multilateral development banks are no longer funding coal businesses, and many of the major US coal producers have gone bankrupt. The fossil fuel sector now lags the broader market[42].

A report for the Prudential Regulation Authority (PRA) set out that "For banks, the financial risks from climate change have tended to be beyond their planning horizons". The PRA's survey of 90% of the UK banking sector, representing over $11trn of assets, found that these horizons averaged four years – in other words, before risks would be expected to be fully realised and prior to ambitious climate policies taking effect[43]. That notwithstanding, the PRA's latest survey finds that almost three quarters of banks are starting to treat the risks from climate change like other financial risks – rather than viewing them simply as a corporate social responsibility issue[44].

In contrast, there is a growing base of sustainability focussed investors. They are supported by the better financial returns available from investing in 'green'[45]. A recent report by RE100[46], which draws on 2016-17 data from a sample of 3,500 companies, shows that RE100 businesses (those committed to sourcing 100 per cent of their electricity consumption from renewable generation sources) consistently perform better than non-members on two key financial indicators: net profit margin and EBIT margin (Earnings Before Interest and Taxes). The difference is significant (up to 7.7 per cent) and is true across all sectors (most prominently for IT, telecommunications, construction and real estate).

Cities can benefit directly from a focus on sustainable investment. New Climate Economy concluded that 'More compact, connected, and coordinated cities will be worth up to US$17 trillion in economic savings by 2050 and will stimulate economic growth by improving access to jobs and housing[47].'

Sustainability focussed investors are driving the growth of green bonds, the proceeds of which are used to finance projects that will improve the environment. US$20bn of green municipal bonds are expected to be issued by US public issuers in 2018 as US states and cities link climate action and investment[48], with New York leading on issuing volumes. London's bond markets are playing an active role in the growth of this green bond market which globally involved over US$100bn of issuance in 2017.

Box 4:
TRANSPORT FOR LONDON'S GREEN BOND[49]

Transport for London (TfL) treasury teams had observed the rapidly expanding green bond market and believing that they had assets and investment needs that would fit green bond criteria began internal discussions to progress the idea. The main driver for issuing the bond was to diversify their investor base, particularly to attract a more diverse geographical spread, plus to highlight TfL's excellent environmental performance and pipeline of green assets.

On 16th April 2015, TfL announced their benchmark ten-year green bond. They worked in partnership with Bank of America Merrill Lynch on the bond launch. The bond issue was targeted at both UK and global investors initially attracting 60 investors and raising £400m at 2.25% with a ten-year maturity. The launch was a big success and was oversubscribed by 50%. The issue also achieved TfL's objective of diversifying the investor base attracting 61% of investment from the UK, 18% from Europe, 15% from Asia and six percent from the Middle East, this is a much greater geographical diversity than TfL would normally attract.

TfL worked closely with Merrill Lynch to develop the framework for their green bond launch. Their green bond framework defined how the net proceeds of the bond are to be invested in line with the Green Bond Principles, market best practice, TfL's needs and investor demands. Merrill Lynch also worked with TfL to obtain a second party opinion on the TfL green bond from DNV. The framework detailed how the proceeds of the bond were to be invested under a broad definition of providing funds to deliver sustainable transport. Investment was to be targeted across five key areas:

- London Rail Capacity and Enhancement Projects;
- World Class Capacity on the London Underground Network;
- Station Upgrades and Station Capacity Projects;
- New Routemaster Buses and Bus Fleet Upgrades; and
- Cycling Improvements.

TfL's green bond issue provides a good example for other organisations with low carbon assets and has paved the way for other issuers with similar sustainable transport assets to come to market.

However, it should be noted that in the workshop discussions with TfL the issue of the additional reporting requirements associated with green bonds compared to other funding mechanisms would discourage TfL from issuing similar bonds in the future.

At the consumer end of the scale, commercial banks are developing 'green mortgage' products which are designed to encourage people to buy energy efficient homes. And specialist crowdfunding businesses are developing green financing products which environmentally conscious citizens can invest in.

However, it should be asked if these products already exist, why isn't green finance and investment happening at scale in London? We look to answer this question in the challenges section of this report.

4

What is already being done in London?

Firs Farm Wetlands

In terms of decarbonisation London already has a number of schemes and programmes to fund the pipeline of projects to make the transition to a zero carbon London. These include:

Technical Assistance:

- The Mayor's Energy for Londoners (EfL) programme comprises a range of initiatives aimed at accelerating clean energy investment in London. This is aimed at making London's homes warm, healthy and affordable; making workplaces more energy efficient; and supplying more of London's homes and businesses with cleaner, locally produced energy.
- Assisted by ELENA and EIB funding from the EU, which of course will be removed under Brexit, the GLA has pioneered the provision of technical assistance to develop energy efficiency and heat network projects through the following teams within the EfL programme. These include: RE:NEW – domestic energy efficiency; RE:FIT – non-domestic energy efficiency; DEEP – district heating; Flex London, and the EV task force. The work of these teams is highly regarded both in the UK and Europe and they have provided models for larger national UK programmes which have only recently started[50].

Project Funding:

- The GLA has sought to address the market failure of limited funding for low carbon projects through the creation of two funds to providing flexible and competitive finance to enable, accelerate or enhance viable low carbon projects across London. The first fund, the London Energy Efficiency Fund (LEEF), invested just over £90m in 8 projects across 12 London boroughs and mobilised £420m, mostly at a project level, between 2011 and 2018. This has been succeeded by the Mayor's Energy Efficiency Fund (MEEF), a much larger scale fund with greater investment flexibility. However, only £2million of the £500million available through MEEF is allocated to development financing. Both funds are managed by Amber, a leading infrastructure fund management group. Although MEEF funds are guaranteed by the UK government post Brexit it is not clear where and how any follow up fund may be funded after the 2023 deadline for applications.

Although the GLA delivery programmes (REFIT, RENEW, DEEP and Energy Sprong & MEEF development funding) are designed to support project development, these programmes do not provide crucial project management capacity within the boroughs that has been eroded in recent years and is a major barrier identified by stakeholders at the workshops run by the LSDC in 2018[51].

A number of sources of public and private funds currently exist which are summarised in figure 4[52]. It is clear from these tables that public funding is better placed to support project development and that private finance tends to focus on project construction.

SUMMARY OF PUBLIC FUNDING RESOURCES AVAILABLE FOR LOW CARBON INVESTMENT

Source of Funding	Example	Scale available	Potential to support project development	Potential to finance project construction
Public Borrowing	PWLB	Large scale subject to LA's borrowing capacity	Yes	Yes
	SALIX	£742m projects funded	Limited capacity	Yes
R&D Funding	Innovative UK	Up to £10-20m per project	R&D projects, through competitive process	No
	Climate KIC		Yes, R&D focus	No
Technical capacity	Horizon2020 and other EU funding	Up to £3m per programme over 3 years	Yes, through competitive process	No
Levy on development land value	Community Infrastructure Levy (CIL)	61% of £301m London 2014-2018 revenue unspent	Rules could be changed to fund technical capacity	Can be used to provide grant on first loss funding
	Carbon Offset Payments (COP)	Expected to generate £30-40m p.a.		
Carbon based revenue	ECO	c. £45m p.a.	Limited	Yes

PRIVATE FUNDING - POTENTIAL FUNDING SOURCES

Source of Funding	Example	Scale available	Potential to support project development	Potential to finance project construction
Institutional investors: • Pensions funds • Insurance companies • Sovereign wealth funds	• Bonds • Green bonds	Large scale (£200m+)	Yes	Yes
	Equity	• Large overall scale (£50m+) • Can aggregate small projects	Yes	Yes
Banks	Project finance	£5m+ (ideally £50m+) per project	No	Yes
	Green mortgages	£100,000+ per home	No	Yes
	Consumer finance	£1,000+ per home	No	Yes
Specialist providers	Green Deal Finance Co.	£3,000+ per home		
Social Impact Investors: • Philanthropic trusts • Specialist fund managers	Debt and equity funds	• Generally relatively small scale • Larger scale focus on funding for housing	Limited capacity to support project development	Yes
Community investors	• Crowdfunding • Community share issue	• Small scale • £5m raised for Swindon BC solar project	• Generally not • Community Energy Fund (£15K per applicant), £400K available over 4 years	Yes
Homeowners and landlords	Self finance	Depends on individual resources	Yes	Yes

Figure 4: *Public and Private funding sources from UK100 report for LSDC*

A number of other funding sources exist for other sectors such as resilience, greening, innovation and the circular economy. We have focussed primarily on low carbon funding sources in this report.

INITIATIVES DELIVERING GREEN FINANCE BEYOND LONDON

There are, a growing number of cities that are developing their own green finance programmes and institutions. These include: Toronto, Paris, Frankfurt, Milan, Tokyo, London and New York. Many of the finance mechanisms have been trialled and tested in other parts of the world and could potentially also be used in London. London however often provides the expertise required to develop and set up these funds. UNEP's Shifting Gears report has highlighted the new phase of strategic action on green and sustainable finance that is taking place in many countries[53]. London needs to ensure it is at the forefront if it wants to continue to be a leader in green finance but also ensure that it helps London itself to make the transition to a green economy[54].

Box 5:
LONDON - A GREEN FINANCE CENTRE

The UK's green finance market continues to develop strongly. In the past few years, both the Prudential Regulation Authority (PRA) and the Financial Conduct Authority (FCA) have launched consultations on climate-related financial risk and established a cross-industry wide Climate Finance Risk Forum to further inform and embed supervisory expectations for banks and insurers to consider climate risk.

The British Standards Institute is leading on the development of new sustainable finance standards, including a specification setting out best practice for investment management.

The UK has also seen new and updated initiatives in the fast developing climate risk and analysis space. In October 2018, the FCA launched a Green Fintech Challenge. February 2019 saw the launch of the Spatial Finance Initiative, a collaboration between Oxford University, the City of London's former Green Finance Initiative, the Satellite Applications Catapult, and the Alan Turing Institute. February 2019 also saw ClimateWise (convened by the Cambridge Institute for Sustainability Leadership) launch new frameworks for assessing physical and transition risk.

The government launched it's Green Finance Strategy in 2019 to set out its green finance objectives and address the Green Finance Taskforce's recommendations. This included setting up the Green Finance Institute.

Key Developments

- 2000: The Pensions Act sets out requirements for pension funds to disclose how investment policies integrated ESG issues.
- 2011: Launch of first 'carbon bubble' report from London-based Carbon Tracker.
- 2012: Establishment of UK Green Investment Bank.
- 2013: Mandatory disclosure of GHG emissions for listed companies.
- 2015: Bank of England Prudential Regulatory Authority assessment of climate change and the UK insurance sector.
- 2016: City of London Green Finance Initiative launched.
- 2018: Green Finance Taskforce recommendations
- 2019: Green Finance Strategy published[55]
- 2019: Green Finance Institute launched[56]
- 2020: HM Treasury's review into funding the transition to a net zero greenhouse gas economy: terms of reference[57]

All the recent activity, reports and strategies however have not yet resulted in lasting change towards changing the green investment landscape and accelerating the level of investment in low carbon projects and technologies.

As the UK's principal forum for collaboration between the public and private sector with respect to green finance, the Green Finance Institute (GFI) is playing an integral role in supporting the delivery of the government's Green Finance Strategy. The GFI was set up to mobilise capital towards a net zero carbon and resilient economy through fostering greater cooperation between the public and private sectors, creating new opportunities for investors, and strengthen the UK's reputation as a global hub for green finance.

There are many examples from around the world that London could learn from and also ensure that the mistakes from previous attempts are not made at setting up financial institutions. Any institution set up would also need to solve the issues surrounding the development of a sufficient pipeline of projects. (See Box 6)

Box 6:
LESSONS FROM INTERNATIONAL FINANCIAL CENTRES FOR SUSTAINABILITY

Toronto: The Atmospheric Fund (TAF)[58]

The fund arose out of the Changing Atmosphere Conference. Early finance (equivalent to about £7m) coming from the sale of a jail farm in Toronto, was put into a revolving fund that was off the city's balance sheet.

It was set up as a not-for-profit with a specific mandate to reduce greenhouse gas emissions, through incubating and funding a wide range of programmes, including city-wide street lighting and energy efficiency. TAF has invested £23m and has capitalised over £60m of projects. It has helped drive coal off the system through its grants to wind farms. It also provides equity finance to clean tech companies.

TAF supports three main energy efficiency schemes:

- Home Energy Loan Programme (HELP). This is a loan scheme that comes from a £11.8m fund (the Local Improvement Charge Energy Works Fund) for domestic energy efficiency retrofits.
- Green Condo Loan Programme. Began in 2004 through programmes that put taxes on foreign ownership on new-build condos.
- Efficiency Capital Corporation (ECC). For-profit boutique investment company incubated by TAF (who has 30% of equity).

Lessons from TAF

- Key barrier to attracting private capital is lack of good investment opportunities (not lack of money), so cities need strategies to incubate and nurture new projects. TAF was set up to allow administration fees to be spent on developing projects.
- Long-term consistency and certainty are important: Cities need to find a way to insulate projects from political changes i.e. to ensure that will persist when a new administration arrives to provide consistency and certainty around activity. TAF has had three directors over 25 years and has benefited from being politically independent (but still faces issues when new mayors are elected).
- Need for a reliable stream of financial revenue for the first few years of operation. TAF benefitted from the initial £7m seed fund, and its permanent revolving fund provides innovative and flexible ways of attracting and leveraging public and private capital and supports development of a pipeline of projects too.
- De-risking projects increases market adoption and private capital leverage. Need to look at financing contracts to ensure standardisation and able to be aggregated into portfolio (rather than lots of pilot, household-level projects) that can then be re-financed.
- Regulatory frameworks need to be mutually supportive of the finance structures. For TAF, the HELP programme benefits from a mandate on home improvement, and a change in the Condo Act provisions allowed developers to take money from buyers as an extra surcharge that could be used to pay off efficiency measures, and which was a hard-fought-for (but big) win.

The Toronto example highlights the issues the LSDC has also found in its research and stakeholder conversations. Further details on the key challenges can be found in section 5 of this report.

There is also growing evidence that more and more investors are changing their investment strategies and priorities as the need to meet climate change targets becomes more urgent. Some examples are highlighted in Box 7.

Box 7:
MAINSTREAM INVESTORS ARE READY TO INVEST

Global infrastructure investment needs are vast and measured in trillions. London is a capital market of scale and reach. Institutions based here deploy capital in infrastructure all over the world. We know that all infrastructure must be made resilient to climate change and consistent with the need to reduce greenhouse gasses and therefore reduce risk to our society. It is axiomatic that infrastructure investment lasts. It should deliver stable, long term returns, if well done and that provides beneficiaries, like pension holders, with money to put into the economy and to live better in retirement.

Insurance companies, fund managers and pension funds and banks have all made serious commitments to invest sustainability, to work alongside government to deliver climate targets and then blend public and private finance. Prominent examples are:

- Aviva ("Aviva is determined to make its own contribution to tackling climate change. This is not at odds with business and investment. It is a business imperative.").
- Legal & General, Allianz, AXA, M&G and Macquarie.
- Other big institutional investors who fund infrastructure will be more than interested in a serious coherent plan for London. Examples include: China Investment Corporation, Abu Dhabi Investment Authority, Canada Pension Plan Investment Board, Ontario Teachers and APG.

Investors and banks are also recognising the need to support a just transition to achieving zero carbon targets. And so any new facility could help turn rising awareness into action on the ground. 158 institutions with $10trillion plus in assets have signed an investor statement on the just transition[59] drawing on an investor guide[60]. Local authority pension funds have shown particular interest in ensuring that climate action has a positive social impact and these could be key partners of any facility that is set up. The UK's Banking sector is also exploring how it could support a just transition[61].

In addition, it is clear from research undertaken by the OECD and others that there is a need for an integrated, multi-level policy framework to drive forward green investment. The challenge is not just to increase green finance but for all finance to become green. A recent OECD, UNEP, World Bank Group report[62] highlights six transformative areas in which action is required to align financial flows with low-emission, resilient infrastructure (see Box 8).

Box 8: DEVELOPING A POLICY FRAMEWORK FOR FINANCING CLIMATE FUTURES[63]

A recent OECD, UNEP, World Bank Group report[64] highlights six transformative areas in which action is required to align financial flows with low-emission, resilient infrastructure.

1. **Plan infrastructure for a low-emission and resilient future,** by rethinking planning at all levels of governments to align current infrastructure project plans with long-term climate and development objectives, avoid carbon lock-in and make resilience the norm in infrastructure decisions.
2. **Unleash innovation to accelerate the transition,** by deploying targeted innovation policies and accelerating the deployment of existing technologies, business models and services, swiftly moving the next generation of solutions from the lab to the market and promoting international technology diffusion to make sure innovation benefits all.
3. **Ensure fiscal sustainability for a low-emission, resilient future,** by diversifying sources of government revenue to reduce carbon entanglement, aligning fiscal and budgetary incentives with climate objectives and harnessing the power of public procurement and public institutions' spending while ensuring an inclusive transition along the way.
4. **Reset the financial system in line with long-term climate risks and opportunities,** by fixing biased incentives, capability gaps and inadequate climate risk disclosure and pricing that are hindering the allocation of finance to low-emission, resilient infrastructure.
5. **Rethink development finance for climate,** by ensuring that development finance institutions have the resources, mandates and incentives to deliver transformative climate action, attract new investors and sources of finance by using concessional finance strategically, and help countries advance their climate agendas and build enabling environments and "climate markets".
6. **Empower city governments to build low-emission and resilient urban societies,** by developing capacity to more effectively plan and finance the right infrastructure, aligning national and local fiscal regulations with investment needs, and building climate-related and project finance capacity at the city level.

The UNEP Shifting Gears report[65] into financial centres has reported common barriers to scaling up the expansion of green and sustainable finance in their markets (see Box 9). These barriers mirror the challenges highlighted by public authorities in our research and shows that the challenges to increasing the scale of green investment and projects needs to be tackled by both the private and public sectors in partnership.

Box 9: CHALLENGES, BARRIERS AND STRATEGIC PRIORITIES FOR FINANCE CENTRES[66]

These included:

- **Lacking availability of green products** is a persistent challenge across many financial centres, across asset classes. With respect to origination, the capacity of issuers to fulfil robust project preparation and implementation requirements associated with labelled financial products (e.g. green bond requirements) is a consistent issue.
- **Inconsistent standards** for green and sustainable finance are an emerging challenge, including in sophisticated markets where policy frameworks for sustainable finance are evolving rapidly. Lack of a shared language for green and sustainable finance is a key constraint, highlighting the need for continued dialogue between public and private stakeholders on the development of taxonomies for sustainable finance or sustainable economic activities (underway in several jurisdictions).
- **Awareness and capacity** remain low in some financial centres, including where overall levels of capital markets development are at an initial stage. However, this is not an issue confined to emerging or developing market economies – levels of familiarity with sustainability-related risks and opportunities vary widely among financial market participants, even within the most advanced financial centres.
- **Engagement of public authorities** can be an issue in those centres where initiatives are led by market participants, such as industry associations.

5

Challenges to delivering the investment London needs

The previous sections have highlighted the scale of the investment London needs if it is to meet its targets and aspirations. There is also a clear funding gap to deliver this investment. Public investment alone can't meet this challenge and private finance will be required. The diversity of funding and programme activity to decarbonise London and the growing role of green finance has been highlighted. These provide a good base to build on, but they are not sufficient to deliver a zero carbon London.

In the preparation of this report and the stakeholder research undertaken by UK100, the LSDC has examined in detail the state of climate and environmental funding across all sectors of London's economy and compared this to the challenges ahead. The LSDC has identified three core barriers to delivering the scale and quality of investment needed:

- **Fragmentation of Capacity and Funding** between the GLA and boroughs means there is a lack of capacity and skills to develop sufficient financeable projects; just delivering the energy projects needed in the next 5 years alone is likely to require 5-10 times more annual development funding. Fragmentation also reduces the ability of the GLA and boroughs to tap into the large pools of institutional capital in London seeking green investment opportunities which require minimum investments of £50-100 million.
- **Fragmentation of Infrastructure and Ownership:** the new systemic solutions required do not map neatly onto existing infrastructure sectors of electricity, gas, water, waste, transport and flood defence and often have multiple owners. Delivering a zero carbon London requires innovative facilitation of integrated investment across a number of relevant stakeholders including the finance sector[67].
- **Fragmentation of Value:** many green investments bring multiple social and environmental benefits that are not captured in current financial systems. Energy efficient and warm homes improve health, lower poverty, create good local jobs and lower local pollution as well as reducing carbon emissions. Green infrastructure reduces pressures on hard storm water infrastructure as well as providing other health, biodiversity, air quality and amenity value. Too often investment of public sector funds is constrained by a systemic siloed straight jacket, leaving them unable to be combined to support the optimum outcomes[68].

In addition to these core barriers, the research and workshops the LSDC has run have identified additional challenges that need to be addressed if the scale and integration of investment required in London is to be delivered:

- There is a challenge of achieving **scale** – the current level of activity won't deliver the carbon targets.
- The challenge of **upfront costs** and **long payback periods** and the need for **patient capital** were raised repeatedly.
- There is a challenge of achieving **integration** – existing funding and finance sources, the capacity to access them and sectoral obligations to use them to decarbonise London are fragmented and disjointed. Funding and finance is fragmented across multiple sources.
- The **people and skills** that need to be brought together to drive projects through the funding and finance process are distributed across multiple sectors and lack the resources and/or incentives to work together.
- The regulated sectors investing in London's infrastructure – the roads, pipes, energy and other systems that need to work together to deliver decarbonisation also face barriers to integrated investment in London.

From the research, discussions and workshops the LSDC has run, we also see that the investment challenges include:

- generating the required **scale of investment and pipeline of projects**
- securing **new sources of funding and finance**
- issues around long term **ownership of assets**
- the **integration of environment, energy and sustainable development outcomes** into all investment flows into London and
- providing **policy certainty** over the long term

Other challenges were also identified as part of the UK00 research and workshops the LSDC ran with key London stakeholders. These included:

- The need to develop **high quality supply chains** for decarbonising London
- Ensuring that **disadvantaged communities benefit from new low carbon jobs and technologies**
- Lack of **good quality data** from projects for investment decisions
- Need for **mandatory targets and a stable policy environment** that is not subject to constant changes by political decision makers

Further details of these key challenges and the barriers to investment are grouped and highlighted below. Addressing these challenges will be about capturing an opportunity that will help drive London to meet its targets. Private capital is available to invest in a sustainable London, and at a significant scale. This investment has the potential to transform London and enable the investment the public sector cannot fund. However, public sector action can unlock this investment for London and for the wider UK's benefit.

CHALLENGE 1 – GENERATING SUFFICIENT SCALE OF ACTIVITY AND GREEN FINANCE FROM 2025

A key finding of the Zero Carbon London: A 1.5°C compatible plan[69] and the Element Energy Report produced for the GLA and C40 cities[70] is that without further interventions, London's current baseline actions will result in the plateauing of CO_2 emissions over the next ten years, as shown in the baseline scenario below in figure 5.

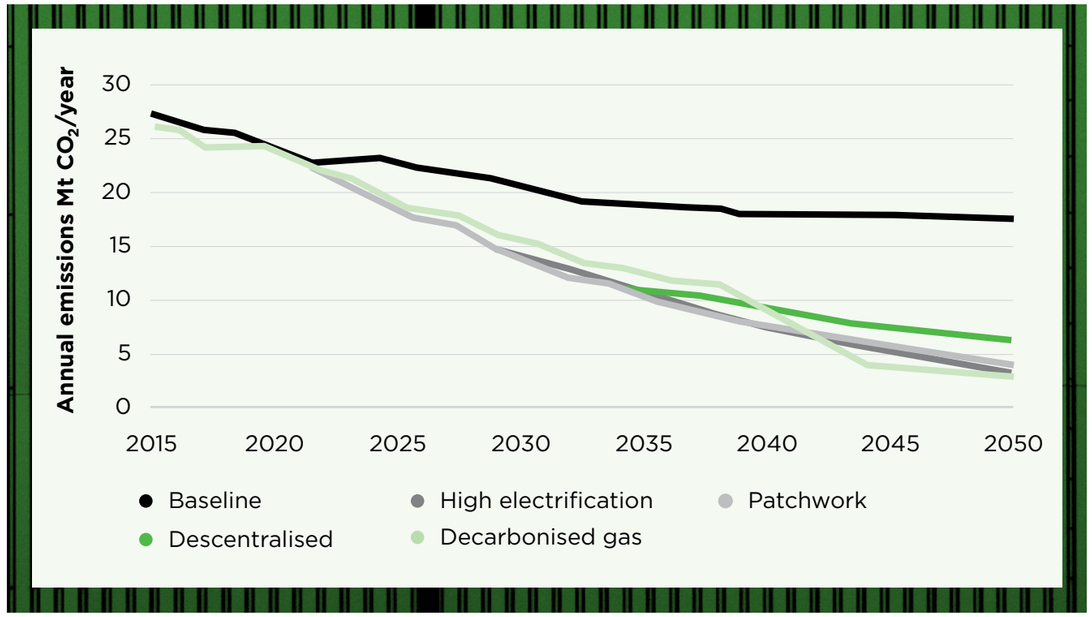


Figure 5: *Annual Emissions for five decarbonisation scenarios. Source Figure 2-3 Element Energy report, page 9, 2018*

There is clearly not a sufficient scale of activity to deliver London's zero carbon goals if the carbon targets are to be met. The Element Energy report highlights that there are quick win policy actions that can be taken immediately, whether locally or nationally including:

- Energy efficiency - bringing 70 per cent of London's buildings to EPC C or above by 2030,
- Rollout of heat networks to an additional 70,000 homes by 2025,
- Deployment of heat pumps in more than 300,000 buildings by 2025,
- New-build regulations mandating high efficiency and low carbon heating,
- Coordination of EV charging infrastructure deployment.

These actions support the minimum level of low carbon technologies present in any of the low carbon pathways the Element Energy report outlines to 2050. However, they require significant activity from 2020 and therefore policy decisions are needed now. They also require investment. Delivering this scale of investment requires a pipeline of projects to be developed.

Once many of the large-scale national challenges have been implemented such as upstream large-scale fossil generation switch off and decarbonisation of the grid, we will need to move to programmes involving people and behaviour change which are often difficult and complex to implement.

CHALLENGE 2 – DEVELOPING AN INVESTMENT PIPELINE

London needs to create a pipeline of investment opportunities, in order to attract private finance to support its transition to zero carbon. Much of the required investment relates to assets with a very long economic life such as heat networks and fabric alterations to buildings. The simple financial payback for such investment can be long. Minimising the cost of capital and maximising the term over which debt finance can be repaid for this investment is critical.

This report does not review the different sorts of financial structures that can be used to fund infrastructure investment but can these be found in the UK100 report the LSDC commissioned. These can involve a range of approaches from direct on-balance investment to the use of project specific special purpose finance vehicles. The cost of the underlying capital will depend on investor perception and appetite for the underlying risks presented by the investment.

From our workshop discussions and research, it is clear that investors need to be better connected with the low carbon projects that London needs to achieve its zero carbon ambitions. Private capital will not fund project development until it understands how it is can generate an appropriate return from this investment. Different types of private investment come at different stages but in general tend to come at later less risky stages of projects e.g. when operational. And the private sector is likely to only invest in low risk projects (see figure 8). Therefore, public funding is often required for pipeline development or a more proactive institution such as the Green Investment Bank (GIB). Institutions such as the GIB were specifically set up to help develop public funding streams for the development of perceived riskier and longer term payback low carbon projects.

Box 10:
GREEN INVESTMENT BANK AND EUROPEAN INVESTMENT BANK

The UK Green Investment Bank was established in 2010 as the world's first public financial institution dedicated to climate and environmental outcomes[71]. Capitalised with £4bn of public funding the GIB leveraged an additional £9bn of private funding into profitable green projects before it was privatised for fiscal reasons in 2015. The GIB was the most successful financial instrument created by the UK government to drive investment after the financial crisis. The GIB outperformed the contemporaneous HMT investment guarantee scheme and the Pensions Platform in terms of private finance mobilised and made a profit for the Treasury.

A critical reason for the GIB's success was the dedicated team of investment professionals working with technical sector experts dedicated to "market making" in new sectors; for example, co-developing new approaches to financing LED streetlights with local councils. The GIB was particularly important – along with the European Investment Bank - in driving the development of a mature private financing market in the offshore wind sector by anchoring consortia of investors and taking risk out of the early deals[72].

Since the privatisation of the GIB, the European Investment Bank (EIB) has become the largest single investor in the UK clean energy sector. Brexit will sharply reduce the UK's ability to access the EIB[73]. This has sparked calls for the creation of a new UK Infrastructure Bank to play a similar role by a range of actors including the National Infrastructure Commission[74].

The Green Finance Taskforce recommended that the UK establish a range of new funds, financial instruments and project development facilities to bridge the funding gap for delivering its climate change and environmental goals[75]. The Treasury issued a consultation which included requests for views on the case for a national infrastructure bank in 2019[76].

Other examples around the world of green investment banks such as Montgomery Bank and New York Green Bank exist which were set up to address these market failures.

Box 11:
NEW YORK GREEN BANK: AGENT FOR GREATER PRIVATE SECTOR INVESTMENT IN SUSTAINABLE INFRASTRUCTURE[77]

New York Green Bank (NYGB) has been established as a public-private partnership. It is a state-sponsored speciality finance entity designed to address barriers and gaps in clean energy financing markets – and to transform those markets as part of the integrated strategic state wide energy plan.

The overall energy strategy in New York State is aimed at taking the clean energy financing markets to the next level in achieving significant scale and momentum. Using a portion of the State's annual clean energy funding to capitalize NYGB over a defined period, NYGB deploys these monies in collaboration with private sector clients and partners in areas where market barriers and financing gaps exist, stimulating growth. As NYGB works where clean energy deployment demand is constrained by the lack of available financing, NYGB has the ability to charge for its capital and so generate assets that earn market rates of return. Since NYGB provides financial products with defined repayment periods, NYGB also has the ability to recycle its capital – all as part of an integrated plan to provide better returns to ratepayers in the transformation of New York State's energy assets[78].

Since inception (as of September 30th 2019), NY Green Bank has[79]:

- received investment proposals of more than $3.8bn
- an active pipeline of potential investments proceeding to close of $828.4m
- stimulated clean energy investments in New York with project costs of up to $2.17bn
- maintained self-sufficiency, generating revenues of $71.5m

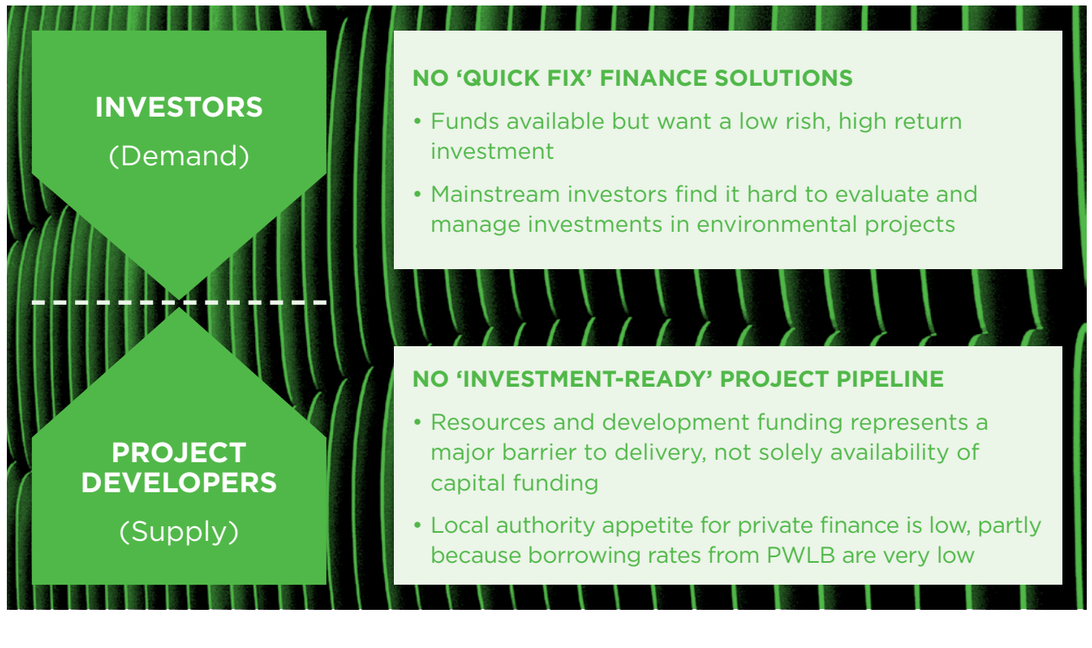


Figure 6: *Supply and Demand of Low Carbon Projects*

As well as a lack of suitable projects in terms of size and risk for investors, there may also be limitations to the type of investment acceptable to asset owners. Public entities may wish to retain the majority stake in assets and projects that they are developing for the public good.

London is a global financial centre. Its financial institutions manage large pools of capital which are keen to invest in clean energy and infrastructure related projects which offer appropriate returns for the risks they offer. Whilst the bond markets require large transaction sizes for bond finance to be cost effective, commercial banks have the flexibility to finance relatively small individual investments, provided they can develop a cost effective offering to approach the market with.

All the potential sources of finance need a pipeline of financeable opportunities to invest in. If these do not exist funders will look elsewhere, where the opportunities are clearer and easier to access. Financiers are primarily interested in deploying capital often at different stages of the project and with different exit strategies. They are not developers of projects. They require a development ecosystem to be created which can present them with investment opportunities.

For any individual project to be developed and be ready for finance it needs to complete the path illustrated in figure 7. However, the motivation and incentives will vary for different types of projects and sectors (see Appendix 1 for more details).

Figure 7: *The project development pipeline*

Public and private sector funding for the development cycle

A pipeline of projects requires funding for projects from concept, through development and commercialisation, onto construction and then operation. Each stage has different challenges and risks, and requires the appropriate expertise to deliver. Those risks will vary depending on many factors such as the type of project, ownership and revenue streams.

Providing early stage project finance is not appealing to investors and local authorities lack the resources, expertise and incentives to develop projects to be ready to secure private finance.

In order to attract private capital into a project, government and the public sector may need to support the construction costs with grants or 'patient' capital in order to make the remaining investment proposition financeable. If the returns are too low, the public sector may also need to support the project's underlying revenue in order to attract private capital.

Private capital will usually be provided as a mix of debt and equity, possibly including mezzanine finance[80] which would sit in the capital structure between debt and equity. The precise mix of capital and its terms would depend on the risk profile of the project. The repayment period of the debt may be tailored to the economic life of the underlying project.

Construction debt finance is usually provided by banks, although for large enough projects (usually at least £100m) it may be possible to raise this through the bond market. If the required investment is going to attract private capital it will need to offer sufficient financial returns over time. Some public support will be required - for example as is envisaged with heat networks by HNIP, either as first loss capital, through revenue support or guarantees.

Another key function provided by the Green Investment Bank was public private risk-sharing via co-investment, which protected investors from a retroactive adjustment of policy support that affects the expected risk adjusted returns. In a post-Green Investment Bank privatisation era – one in which the UK also faces a loss of access to the EIB, a major UK infrastructure lender – other risk-sharing vehicles become very important[81].

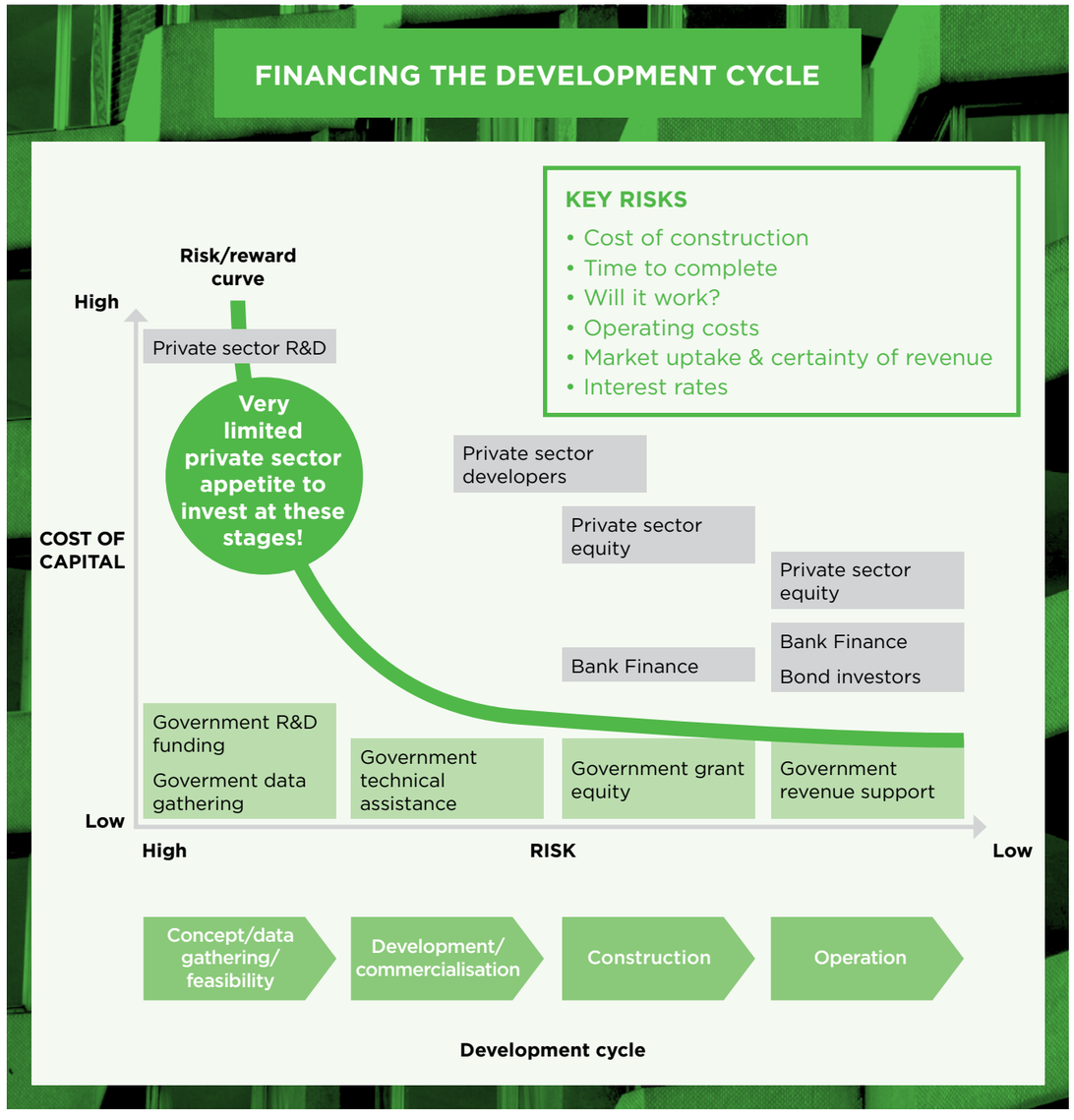


Figure 8: *Risk and Reward in project development and delivery. Source UK100 report to LDSC*

As an alternative to using private finance, government can use public funding such as Public Works Loan Board (PWLB) as it does with other forms of infrastructure such as roads. In this case, it can raise the necessary finance through borrowing in its own name, which it currently does mainly by issuing long term bonds in the gilt market. However, whether public funding or private finance is used an acceptable business case will be required. The role of the PWLB and the effects of Brexit, could be an opportunity to rethink the PWLB role as well. Box 12, below illustrates examples of how municipal bonds can beat PWLB rates. The recent rise in the rate of borrowing from the PWLB may make green or municipal bonds more viable alternatives for public bodies[82].

Box 12: USE OF MUNICIPAL BONDS IN BIRMINGHAM AND WARRINGTON[83]

Birmingham City Council's municipal bond, known as the 'Brummie Bond', was launched in April 2017 to finance investment in housing in the city. Phoenix Life (based in Birmingham) agreed to lend £45 million to the council in three tranches of £15 million at an average rate of 2.3 per cent, with 18, 20 and 24 year durations. The Council claims the deal makes a saving of £1.4 million in revenue spend on interest over the life of the bond. The same amount from the Public Works Loan Board would be charged at 2.75 per cent.

The deal is still relatively new but it already shows the importance of:

- Beating the PWLB rate – if private borrowing can only provide borrowing at a more expensive rate than the PWLB, then the PWLB is the more attractive option
- Providing the right incentives to private investors – Phoenix Life are a pension fund looking for a steady return over a long time-frame to make their asset portfolio stable

Similarly, Warrington issued a £150 million bond linked to inflation and capped at 3.8 per cent that saves £12 million in total compared to the PWLB in 2015, which was the first in over a decade. This allowed Warrington not just a cheaper rate than the PWLB, but it also gives the council flexibility about when it can access future tranches of financing. This was after a process of acquiring a credit rating, updating auditors, and taking the time to risk assess each offer and confirm the viability of the final bond offer.

The public sector can play a key role in developing and funding low carbon projects given their significant land and property ownership. Box 13 illustrates an example that could be taken forward by London.

Box 13:
PREPARING CITY-WIDE INVESTMENT PROSPECTUSES - CAPTURING OPPORTUNITIES FOR INVESTORS IN BRISTOL AND LONDON

In May 2018, Bristol City Council (BCC) released the 'City Leap Prospectus'[84] to support its vision of becoming a zero-carbon city by 2050[85]. The prospectus sets out details of the councils' current sustainability programs, past successes and identifies £875 million pounds of investment opportunities across a range of sectors. The City Leap Prospectus provided a four-month period where it was open to Expressions of Interest (EOI) for organisations that were keen on exploring potential partnership opportunities. EOI collected information on the nature and long-term vision of respondents along with the information about the area of the prospectus that is of interest and specific details about potential partnership options. The information collected through the EOIs was intentionally restricted to a high level to make the EOIs quick and simple to complete in order to ensure that Small and Medium Enterprises (SMEs) and community organisations were not excluded from taking part.

ESTIMATED LOW CARBON INVESTMENT OPPORTUNITIES IN BRISTOL	
Heat networks	£300m
Small energy systems	£125m
Domestic energy efficiency	£300m
Commercial energy efficienc	£100m
Renewable energy	£40m
Monitoring, dissemination and evaluation	£40m
Transport	Additional
Hydrogen	Additional
Marine energy	Additional
TOTAL	**£875m**

Bristol pushed the prospectus through; national and international advertising, social media, through partnership networks, direct communications and platforms at local and national events. The response to the prospectus exceeded Bristol's expectations generating 180 responses from a wide range of stakeholders.

MODEL 1 > Joint Venture

BCC & Strategic Partner(s)

Relevant Options Appraisal Matrix References: 2.1, 2.2, 2.3, 2.4

MODEL 2 > Investment Fund

BCC 'Strategic' coordination role

Relevant Options Appraisal Matrix References: 2.5

MODEL 3 > Strategic Delivery Partner

BCC 'Hands off' role

Relevant Options Appraisal Matrix References: 2.1, 2.2, 2.3

MODEL 4 > Consortium

'Multiple' Strategic Delivery Partners with BCC having a 'Hands off' role

Relevant Options Appraisal Matrix References: 2.1, 2.2, 2.3, 2.4

MODEL 5 > Multi-Framework

BCC Energy Service 'Lead' delivery role & procurement of 3rd party funding

Relevant Options Appraisal Matrix References: 3.1(b), 3.1(d)

MODEL 6 > BCC Self Deliver

BCC fully owns execution vehicle(s) & retains all project 'delivery risk'

Relevant Options Appraisal Matrix References: 3.1(e)

Figure 9: *The six different delivery models explored as part of the city leap options appraisal*

The EOIs returned as part of the City Leap Prospectus were used as a soft market test to assess the type and range of potential partners that were interested in working with BCC. This allowed BCC to undertake a comprehensive options appraisal of different delivery models that could be taken forward. There were six different delivery models that were examined in detail[86].

The results of the soft market testing and options appraisal was that the preferred option for taking forward the City Leap program was a 'Joint Venture' structure. This structure was deemed most likely to deliver the councils key objectives. As a result, BCC approved the allocation of £2 million to fund the creation of a dedicated project delivery team within the council and specialist external advisors to support the procurement as well as a private sector partner with whom to form a Joint Venture partnership.

Investors' Prospectus for a Zero Carbon London

The City Leap Prospectus was designed to consolidate and showcase a compelling value proposition for potential project delivery partners. The prospectus outlined the council's assets, sphere of influence and the work done by its energy services team and their local authority owned energy company, Bristol Energy. London would need to take a different approach to assembling a similar value proposition due to its size and complex governance structure.

In Bristol, the delivery of many of the investment opportunities lie within control of BCC, allowing them to easily group them under the umbrella of the City Leap programme. This would not be possible in London due to the subdivision of London's governance between the Greater London Authority (GLA) and the London boroughs. Whilst the GLA has the ability to co-ordinate and convene action between the boroughs it does not maintain a level of control over the direct delivery of London's infrastructure that would allow it to draw together the same list of projects that have been put underneath the banner of City Leap.

A London Green Investment Prospectus would first need to look inwards to identify potential projects and project delivery partners that could be grouped together into a prospectus before the outward looking exercise of identifying potential project financiers could take place. Whilst there would be challenges to the creation of a London Green Investment prospectus the resulting rewards could be considerable given London's size and the resulting investment opportunity. It would set out a range of infrastructure projects needed to set London on the pathway to net zero and should be investigated further in the short to medium term.

CHALLENGE 3 – ENABLING LONDON AND ITS BOROUGHS TO DELIVER ZERO CARBON

A shift to increased demand side action in terms of energy infrastructure will mean that boroughs will have a far greater role to play in delivering the decarbonisation of London. The borough level is where projects will be conceived, developed and delivered. Their role is critical as the introduction of new technologies in neighbourhoods and homes will require significant community buy-in: consumer acceptance will be key to ensuring that any large scale roll out of projects is successful and this will need households to engage with trusted local intermediaries to understand what the benefits will be for them. The challenges faced by the government's smart meter programme – and also the failure of the Green Deal - has clearly shown where the lack of local engagement has led to major project delivery setbacks.

The public sector will play a key role in developing and funding low carbon projects given their significant land and property ownership and their full or partial control of key heat loads such as leisure centres, schools and hospitals.

Yet the majority of local authorities in London (and more widely) lack the staff capacity, expertise and resources to develop and finance carbon reduction projects. Despite the key role local authorities play in reducing emissions and adapting to climate change[87], councils do not have any statutory responsibility in relation to climate change, and hence, many local authorities have reduced resources allocated to any carbon reduction programmes. Funding for sustainable energy has reduced both from UK sources, and importantly in the context of Brexit, EU sources.

These financial and funding pressures result in boroughs being unable to recruit and retain staff with the specialist expertise required to drive, develop and manage projects through the investment pipeline. Even keeping track and knowledge of existing assets can be a challenge for resource-strapped boroughs.

Box 14: LONDON COUNCILS DECLARING A CLIMATE EMERGENCY

A number of London boroughs along with over 50% of local authorities in the UK have declared a climate emergency over the past year. These include: Barking and Dagenham, Brent, Camden, Croydon, Ealing, Enfield, Greenwich, Hackney, Hammersmith & Fulham, Haringey, Harrow, Hillingdon, Hounslow, Islington, Kensington & Chelsea, Kingston upon Thames, Lambeth, Lewisham, Merton, Newham, Redbridge, Richmond upon Thames, Southwark, Sutton, Tower Hamlets, Waltham Forest, Wandsworth and Westminster.

In addition, London Councils' Transport and Environment Committee (TEC) and the London Environment Directors' Network (LEDNet) comprising London's local government environment leaders have issued a joint statement that sets out their approach to addressing climate change within and between boroughs and commits to six key programmes that they will seek to deliver through meaningful collaboration between boroughs and with wider partners, residents and the business community. The joint statement sets out commitments around:

- Climate ambition and approach
- London Climate Projects
- Climate-informed decision-making including: Governance; Citizen engagement and Resourcing

The statement also says that "They will require London's local government to develop innovative financial strategies that can draw in the funds to deliver these projects, including from central government."[88]

Over the last ten years cuts to local authority budgets have dramatically reduced the resources available to London boroughs (LBs) and the Greater London Authority (GLA) to develop and invest in low carbon projects.

There are few local authority obligations on energy efficiency. Even where there is a will, pressure on budgets for local authorities' statutory responsibilities squeeze out discretionary spending. Borough priorities can also be perceived as incompatible with decarbonisation, for example, building new homes quickly being inconsistent with delivering new homes that are high quality and energy efficient. Although the energy efficiency and carbon policies around the London Plan have been recently strengthened for all major developments with some boroughs also applying it to minor developments or developing their own local policies effective delivery of these policies or collection of carbon offsets depends on boroughs having the staff and resources to ensure these are adhered to.

Over the last ten years EU funding has been a mainstay of many GLA energy programmes and has provided a large proportion of the finance available for green investment. Although many of these funds have been underwritten if already applied for until after Brexit it is not clear what will replace them post Brexit.

Funding for sustainable energy has fallen just at the time a rapid acceleration of investment is needed. Development funding needs to increase by at least an order of magnitude from current levels.

These financial and funding pressures result in boroughs being unable to recruit and retain staff with the specialist expertise required to drive, develop and manage projects through the investment pipeline. Even keeping track and knowledge of existing assets can be a challenge for resource-strapped boroughs.

Local authorities are increasingly looking for opportunities to secure longer-term funding streams and have recognised that energy generation projects, as well as reducing bills through energy efficiency programmes, provides a potential route to generate income to fund front line services. Even with the closure in support mechanisms such as FIT, energy generation projects are still seen as vehicles for long-term income generation.

Increasing numbers of local authorities are being highly innovative (forced into being entrepreneurial?) in this sector and see the value of investing in areas such as energy. Not only does making investments now reduce costs and carbon emissions in the future but it can have strong social benefits, for example, a reduction in fuel poverty with its associated health and welfare benefits.

Box 15:
INVESTING TO SAVE MONEY AND CARBON

Local authorities have access to considerable project financing resources. Many hold reserves so they can invest directly in projects; for example, three different local authorities invested in the Wroughton Solar Park, which was developed by Public Power Solutions, owned by Swindon Borough Council. The Public Works Loan Board provides long-term financing at interest rates as low as 2.7% but typically at 3.5-4%, well below commercial lending rates. Solar projects can also be funded through unspent capital project funding and from the Housing Revenue Account. HMT have increased the base lending rate that can be offered by the PWLB recently which may have an impact on spend to save projects[89].

There is growing, proven potential for innovative sources of financing, such as bond or share offers to the local community. The ability to roll peer-to-peer investments into tax-free Innovative Finance ISAs is proving hugely popular with communities and unlocking new sources of revenue. Around 20 local authorities have joint-ventures with other local authorities or commercial companies for solar investment. In addition, local authorities have large pension funds that could divest from fossil fuels and invest instead in solar, which presents far lower future risk and which accords with the values of many councils.

These tremendous financial advantages combine with an ability to take long project time horizons, relatively easy access to council-owned land and roof space, and exceptionally secure local markets to consume the solar power generated. Hence, local authorities can already structure attractive solar projects today.

Hounslow Council is currently pursuing plans for two subsidy free solar farms, 11MW(p) and 3MW(p), with possible battery storage. One, on a four and a half acre site, is ideally located next to a power substation. Power from both sites could be sleeved back to council buildings and schools. The ideal circumstances for this project mean an exceptionally high IRR is anticipated, with a short payback period. Financing options are being investigated should the project get the green light.

Ref: Leading Lights report: How local authorities are making solar and energy storage work today - https://www.solar-trade.org.uk/wp-content/uploads/2018/04/local-authority-solar-guide-WEB.pdf

CHALLENGE 4 – PROVIDING LONDON WITH THE POWERS TO DRIVE DECARBONISATION

Local authorities in the UK have much more limited revenue and tax raising powers than those in other parts of the world. Government policy on this is unlikely to change materially in the near future although the newly elected government has said it will consult on how it might change the basis of business rates retentions to give local authorities more control over the money they raise locally[90]. London announced in 2019 the first projects to be supported by a £112m investment fund generated from growth in business rate receipts in the capital[91]. London's property values and development activity do provide it with the opportunity to generate land value uplift related revenue.

The limited ability to raise new funding streams has long been acknowledged. The London Finance Commission (LFC) was set up to explore these issues and first reported in 2013. It was reconvened by the current Mayor in 2016 and reported in 2017[92]. The main argument it sets out in its report is that, 'a broader tax base with stronger fiscal controls at the local level will support the delivery of more integrated and efficient services and increased infrastructure investment, while allowing for the reform of individual taxes.'

The LFC made recommendations in the area of property taxation, additional fiscal power, levies on property development. It is at pains to emphasise that devolved tax powers 'would be neutral from day one and not result in tax increases at point of devolution'. The aim is instead to incentivise London to grow its tax

base, including investing in its infrastructure and diversify the range of taxes at its disposal to manage its income more fairly and securely.

The LFC acknowledged the need for significant green and social investment in passing. However, its arguments about powers and ability to act and control investment are directly transferable to the delivery of a zero carbon and sustainable London.

Box 16: INTERNATIONAL EXAMPLES OF POWERS USED TO RAISE ENERGY EFFICIENCY FUNDS

London is more fortunate than most areas of the country as its high property values enable it to generate revenue from development activity, e.g. Community Infrastructure Levy (CIL), S106 Carbon Offset Payments (COP). These revenues are however relatively modest compared to the scale of London's low carbon investment challenge and compared to other cities across the world.

Examples of public funding approaches that have been used in other countries include:

Linking property tax to energy savings:

Property Assessed Clean Energy Financing (PACE) is a financing mechanism used in cities throughout the US. (A similar model, called Environmental Upgrade Agreements, operates in Australia). It allows municipalities to finance energy efficiency retrofits, and for households and business owners to pay for the upfront costs of green initiatives, such as the installation of solar panels, through long term paybacks linked to the building rather than the occupier. This is effective in cities that have high churn rates, such as London. Applying a similar model to the GLA would not be straightforward – it would essentially require the authority to have specific, and additional, money-raising powers that could only come through changes in statute.

Levy on energy bills:

An alternative revenue source is a levy on energy bills.

The City of Boulder, in the USA, voted via a referendum in 2009 for a Climate Action Plan Tax which generates c. US$2m p.a. from a charge to consumer's energy bills.

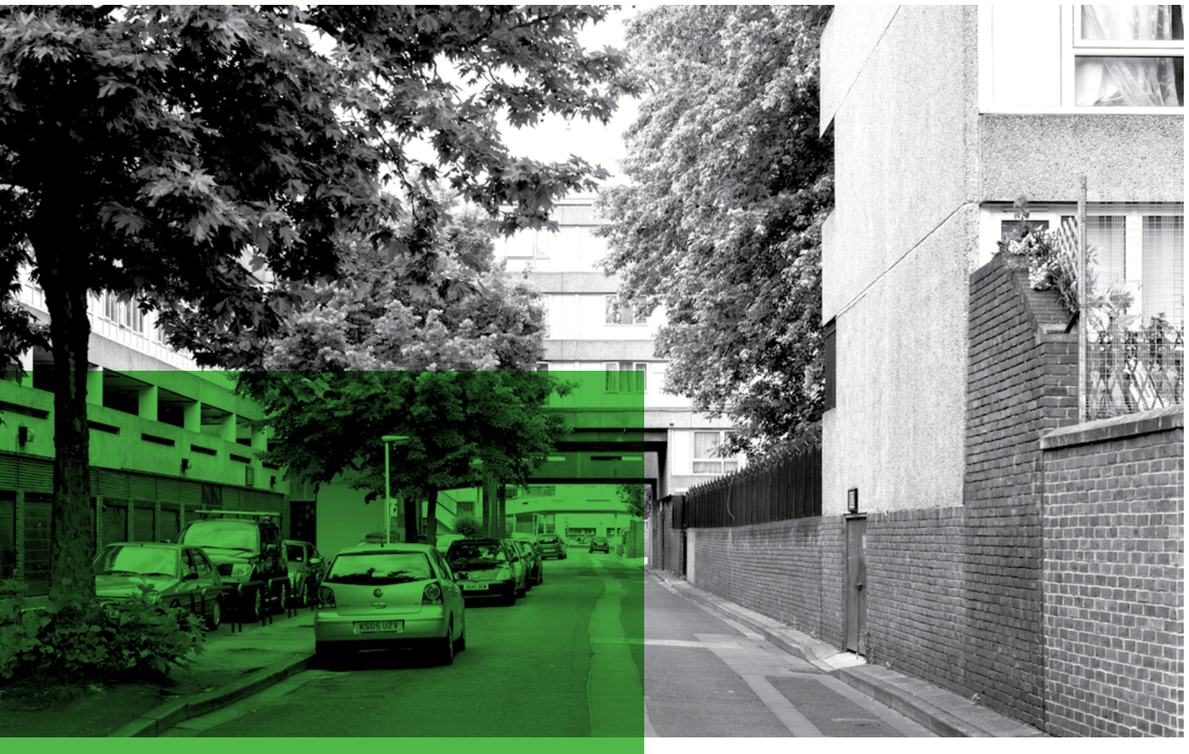
The Connecticut Green Bank has generated much of its funding from a levy on energy bills but has focused its activity on using its public funding to encourage private capital investment in green energy measures. Since its inception in 2011 the bank and its private sector investment partners have deployed over US$1bn in capital for clean energy projects across the state. Projects recorded through FY 2016 show that for every $1 of public funds committed by the Green Bank an additional $6 in private investment occurred in the economy[93].

Although these examples have been successful elsewhere the complex political nature of London and its limited tax raising powers may mean these examples will be difficult to implement in London without considerable increased devolution of powers.

CHALLENGE 5 – WORKING ACROSS BOROUGH BOUNDARIES

With its complex political and governance structures, London faces issues of cross boundary working that many other major world cities do not. Although there are examples of small-scale cross borough cooperation this is limited and in order to meet the scale of the challenge this would need to be normalised. We have highlighted some examples in Box 17.

From the research and discussion the LSDC has undertaken, it is clear that the fragmentation of funding, resources, and institutions for decarbonising London (as well as delivery of other green and sustainable investment) is a significant barrier to the delivery of short and longer term carbon and sustainability targets. There is a clear need for a rapid acceleration in the scale of investment to get on track for 2050. This is addressed in the next section.



Box 17:
THE REGIONAL FLOOD AND COASTAL COMMITTEES AND FLOOD LEVY - A MODEL FOR PARTNERSHIP WORKING AND PROJECT DEVELOPMENT FOR GREEN FINANCE

The Regional Flood and Coastal Committees (RFCC) of England are a model of partnership working that could be developed in other areas requiring green finance. The 12 RFCCs, established under the Flood and Water Management Act 2010, are formed of local authority representatives, independent members, and are supported by the Environment Agency. They are able to raise revenue through a Flood Levy which can be used to support flood and coastal protection projects in the catchment area. The RFCC advises the Environment Agency, who are required to respond to the advice, on delivery of integrated flood and coastal management.

The Thames RFCC, which includes London, summarises its role as 'Joined up plans, programmes and partners'[94]. The partners involved in the RFCC have led the way in developing a shared vision and long-term strategic approach to flood and coastal protection, underpinned by a rolling five-year levy commitment. The ability to set and raise revenue via the Flood Levy on its local authority members (based on the number of Band D Council Tax properties) is a significant enabler of the Committee's effectiveness and creates local authority ownership and buy-in to RFCCs. Between 2011-2017, £67.5m was raised through the levy (which is in addition to the £500m six-year capital programme the RFCC advises on and consents to). The Levy resulted in 39,415 homes being better protected as a result of the 99 RFCC projects delivered between 2011-2017[95]. As well as enabling a range of projects to go ahead which may not have otherwise been possible, the Levy has funded development and preparation work getting projects investment ready – overcoming the problem of a lack of development funding often cited as a barrier to green finance.

This area-based, long-term strategy process and a funding source involving political, technical, industry and community stakeholders, is a model that could be developed for other policy areas requiring increased green finance if London was allowed to raise money through a levy.

6

A route map to 2050 - Financing London's Future – getting on track now for a zero carbon and sustainable London delivering for all

LONDON'S SUSTAINABILITY FINANCING CHALLENGE: THE CASE FOR A NEW INSTITUTION

London is growing fast and all of the £1-1.7 trillion of new investment currently being planned needs to be future ready if it is going to provide secure livelihoods and wellbeing for all of its citizens into the long term. London's unique combination of rapid growth, entrenched existing infrastructure, climate vulnerability and deep decarbonisation targets means it faces unprecedented challenges. London's world-class organisations working on climate solutions and sustainable finance means it also has the resources and capabilities to solve them. **The research and stakeholder engagement the LSDC has undertaken for this report shows that London is currently not able to invest in the right infrastructure to secure its future as a leading global city in a climate-changed world.**

Many of the reasons for misaligned investment in London lie in the over-centralisation of powers and financing in central UK government. This seems unlikely to change radically in the short term. Brexit will worsen London's problems by removing access to vital EU funding the GLA and boroughs currently rely on for delivering low carbon and resilient investment[96].

Waiting for national reforms to deliver London's necessary clean investment would leave a legacy of high carbon, vulnerable infrastructure and buildings. Much of the UK's clean investment has gone to non-urban suitable infrastructure such as large-scale solar and offshore wind, so there is a need to fund projects suitable for cities such as London. There is an urgent need to develop at-scale solutions to London's unique future financing needs now. **The LSDC believes that an ambitious approach to financing will deliver immediate benefits for all Londoners and provide a critical tool for shaping the national reforms needed to give London the powers and funding required in the longer term.**

The scale of the investment challenge as indicated in the Zero Carbon London: A 1.5°C compatible plan[97] looks at four possible decarbonisation scenarios that would result in a deeper level of decarbonisation and require significant investment in the 2020s. These scenarios are likely to be underestimates of the action London needs to take in the next two decades:

- Decentralised: heat zoning, existing building connection policy and other policy support leading to 1.4m district heating connections
- High electrification: CO_2 standards for replacement heating systems and other policy support leading to 3.8m heat pumps and 1m direct electric heaters
- Decarbonised gas: coordinated effort to convert London's gas grid system to hydrogen between 2040 and 2050. 3.5m boilers replaced
- Patchwork: CO_2 standards for replacement heating systems, heat zoning and other policy support leading to 3.8m heat pumps and hybrid heat pumps and 900,00 heat network connections. H2 backbone constructed by 2040

Whatever happens as a result of the UK's decision to leave the European Union, the next few years will see changes to national climate change policy that will offer challenges and opportunities for London. The Government has adopted the UK Committee on Climate Change (CCC) advice to set a strict 2050 net zero greenhouse gas emissions target, requiring a major overhaul of medium-term energy and transport policies[98] and will publish its plans to reduce emissions in key sectors later this year.

The analysis in this report shows that the current level of funding for energy efficiency, heat, clean energy etc. in London is already inadequate to meet the Mayor's current 2050 net zero target[99]. The UK government has agreed to the CCC recommendation for a much stricter 2050 net zero GHG target for the UK as a whole, although this does not include international maritime and aviation emissions and without relying on international offsets, the wealth and profile of London means that it will be expected to strengthen its current net zero target as part of delivering its "fair share" on UK climate action. Scotland has already agreed to meet a net zero GHG target by 2045[100].

Since the UK established the Green Investment Bank this dedicated model has been replicated in over 12 countries and at sub-national level in the USA. These standalone institutions leveraged over $50bn in clean investment in 2019; up 20% from 2018[101]. Alongside the creation of new "greenfield" institutions a large number of the existing 500 national development institutions worldwide have undertaken reforms to improve their financing of clean and resilient infrastructure. Major national development banks committed over $200bn in green investment in 2018[102].

"The LSDC believes that an ambitious approach to financing will deliver immediate benefits for all Londoners and provide a critical tool for shaping the national reforms needed to give London the powers and funding required in the longer term."

Interest in establishing new green banks is growing globally with the recent Green Bank Design Summit attracting over 30 countries including 11 who have "live" processes underway to develop new institutions including in China, India, South Africa, Vietnam and the Philippines[103]. UK experts are active in supporting these international processes including through support from UK development finance.

The largest process of developing a green bank has been undertaken by the EIB - the world's largest development bank which is now identified as the "European Climate Bank"[104]. The EIB adopted a new energy policy in 2019 stopping all investment in fossil fuels and setting a target of allocating 50% of its investment to climate-related activities by 2025. This aggressive reorientation has been supported by the creation of new supporting facilities including the EU Invest Risk Fund which allows the EIB to support riskier projects and the European Investment Advisory Hub which provides assistance to project developers to get them decision ready.

In the future, the EIB is looking to partner more directly with national development banks to support key green sectors like energy efficiency and blend its financing with direct grant support from EU structural funds. The EIB will also play a central role in supporting just transition across the EU through the new European Just Transition Fund[105].

London already has a devolved Housing Bank to support the development of social housing[106]. Funded with money from Homes England which supports house building nationally, the London Housing Bank is a dedicated mechanism for the capital to support more high quality social housing. This model of devolved public banking provides a precedent and learning opportunity for creating a similar institution for London.

The global movement towards creating dedicated green investment facilities and reforming existing development banks so they can support green financing has been driven by the failure of pure policy and pricing based approaches to drive investment at the scale and pace required. The absence of a national investment bank puts the UK at a structural disadvantage in shifting to a low carbon and resilient economy.

Scotland has started this process and set up its own National Investment Bank. With the basic principles set out to set up the SNIB it would be useful for London to investigate the potential for a similar institution that could help finance the transition towards a zero carbon London.

Box 18: SCOTTISH NATIONAL INVESTMENT BANK (SNIB)[107]

The Scottish National Investment Bank Bill[108] was passed on 22nd January 2020 and the bank will become operational later this year. The proposal to establish the bank was initially outlined in the Scottish Government's Programme for Government 2017 to 2018[109], with the primary vision of the Bank being:

"to provide finance and act to catalyse private investment to achieve a step change in growth for the Scottish economy by powering innovation and accelerating the move to a net-zero emissions, high-tech, connected, globally-competitive and inclusive economy".

The new, mission-led institution[110] will actively create and shape markets. It will intervene in a variety of areas – to supporting early stage and smaller firms and larger scale innovative projects get access to investment, through to financing infrastructure where the private sector will not invest.

The Bill explicitly highlights that the articles of association of the Bank must include the following objects to supporting economic development and employment in Scotland:

- To invest in inclusive and sustainable economic growth
- Promote environmental wellbeing, and in particular, support the transitions required to meet Scotland's net zero emissions target and the proposals and policies around circular economy initiatives
- Promote just transition principles (as defined in the Climate Change (Scotland) Act 2009)
- Providing patient capital to create and shape markets, and
- Promote and develop the activities of small to medium sized enterprises

The Scottish Government has committed to putting £2bn of funding into the bank over 10 years.

The UK National Infrastructure Commission has recommended major - if not yet adequate – increases in funding for energy efficiency (an extra £500m per annum) and flood defence[111]. The Government's new Green Finance Strategy has laid out a routemap for financing the UK climate transition and positioning London as a global centre for sustainable finance through the setting up of the GFI. HMT is currently consulting on how to replace the current UK Public Private Partnership (PPP) system, including the idea put forward by the National Infrastructure Commission of establishing a UK National Infrastructure Bank but given other priorities and lukewarm HMT support it is unlikely that much progress will be made over the next year. London will have the opportunity to make a forceful case for more public funding and more autonomy over financing and additional powers. **A key element of making this case will be showing that London has the capacity, skills and institutional structures to scale up investment to the necessary levels in a financially responsible and efficient manner.**

Many of the issues London faces in responding to climate and environment challenges are common to other cities in the UK and around the world. Innovative solutions have been developed, implemented and proven elsewhere that could be adapted for London's unique context. In addition, as a global financial centre London can draw upon the world's leading expertise in sustainable finance. Major London-based investors are actively looking for long-term green investment opportunities. London can also make a distinct global contribution in designing financing solutions which strongly support a socially inclusive approach to climate transition; ensuring Londoners benefit from the shift to clean and secure energy and everyone is fairly protected from the unavoidable impacts of climate change. **We have spent 18 months exploring how this can be done. This evidence base is available to politicians, local authorities, financial institutions and any other stakeholders who wish to rise to the challenge.**

There are many examples of green finance institutions globally[112] and London has the ability to lead on this agenda. However, the mistakes and challenges faced by past institutions and lessons from these will need to be considered in the design and governance of any future institution.

Action needs to be taken at the London level to enable delivery at the local level. Only the Mayor can deliver the policy, programme and institutional reform that is needed to drive this agenda. The emerging examples from around the world show this can be done and the significant economic, environmental and social benefits that result (see Section 5).

In the preparation of this report the LSDC has examined in detail the state of climate and environmental funding across all sectors of London's economy and compared this to the challenges ahead. **The LSDC has identified three core barriers and additional challenges to delivering the scale and quality of investment needed:**

1. **Fragmentation of Capacity and Funding:** between the GLA and boroughs means there is a lack of capacity and skills to develop sufficient financeable projects; just delivering the energy projects needed in the next five years alone is likely to require five to ten times more annual development funding. Fragmentation also reduces the ability of the GLA and boroughs to tap into the large pools of institutional capital in London seeking green investment opportunities which require minimum investments of £50-100 million.

2. **Fragmentation of Infrastructure and Ownership:** the new systemic solutions required do not map neatly on existing infrastructure sectors of electricity, gas, water, waste, transport and flood defence and often have multiple owners. Delivering a zero carbon London requires innovative facilitation of integrated investment across a number of relevant stakeholders[113].

3. **Fragmentation of Value:** many green investments bring multiple benefits that are not captured in current financial systems. Energy efficient and warm homes improve health, lower poverty, create good local jobs and lower local pollution as well as reducing carbon emissions. Too often investment of public sector funds is constrained by a systemic siloed straight jacket, leaving them unable to be combined to support the optimum outcomes[114].

The conclusion of the LSDC's research is that incremental reforms, though useful in the short term, are not adequate to overcome these barriers. **We therefore propose that the Mayor develops a major new institution to deliver the future investment London needs: with a working title of the "London Future Finance Facility"**.

Crucially, the London Future Finance Facility would not only **demonstrate how these barriers could be overcome but would prove the case for why London needs to be given greater autonomy with responsibility for city-wide operations and performance alongside the devolution of its finances so that it is able to invest at sufficient scale to leverage City investment at the level needed to decarbonise London.**

SHORT TO MEDIUM TERM RECOMMENDATIONS

Successfully delivering the vision of the London Future Finance Facility will depend on three key factors:

- The **support of the Mayor of London** for this bold and innovative approach.
- Partnership with a **critical mass of boroughs** who would agree to pool resources in appropriate areas with the GLA.
- Ability to further **pool human and financial resources** across the GLA and London whilst gaining access to significant new national public funding sources as they become available.

The report has identified several practical steps which the GLA could implement immediately as part of a phased approach to lay the foundations for the London Future Finance Facility and make a strong case for more money and powers being transferred from central government.

Secure potential funding – Working with boroughs to ensure that the Mayor's new 2020 London Plan zero carbon planning policies are fully implemented, and carbon offset payments are fully secured

The GLA should build on its existing work with boroughs and support them so that that they are equipped to ensure that London Plan policies for zero carbon homes (to be extended shortly to all new development in London) are applied to all relevant applications; and that any emission shortfalls are balanced with developer carbon offset payments[115]. Securing such funding will allow boroughs to fund the necessary staff to undertake a borough-wide decarbonisation plan that would identify, develop and deliver new carbon reduction projects to respond to the climate emergency and get to zero carbon by 2050 (or indeed earlier given many boroughs have declared climate emergencies). The lack of suitably trained staff to identify and develop carbon reduction projects remains a critical issue for many London boroughs – and this is especially true in relation to developing the business case for a pipeline of more significant major projects.

Institutional Support - A new unified and integrated institution to drive action on low carbon energy across London

Current GLA programmes for decarbonising London mainly focus on development of district energy and on energy efficiency in public buildings and social housing with the intention to expand into the private rental and owner occupier sectors for residential buildings. These programmes will need to be expanded into other sectors and areas over time e.g. commercial and industrial buildings along with waste, adaptation and green infrastructure. We propose the GLA considers forming a new single 'Delivery Unit' that merges the roles of DEEP, RE:FIT and RE:NEW, MEEF and potentially other GLA energy related programmes to bring together the funding, finance, skills, support and delivery mechanisms for a low carbon London under one roof with a clear and coherent brand. This new unit would work with boroughs to develop local heat and energy efficiency investment strategies (building on previous GLA 'heat mapping work), identifying opportunities, such as "clean energy zones" and collaborate to develop proposals for funding key innovation projects.

Explore pooling carbon offset funds for cross-borough strategic programmes.

Could London's boroughs consider pooling all or at least a proportion of their carbon offset funds, or collect funds where boroughs are not yet collecting them, to support the establishment of such a fund? This could then be used alongside or incorporated with MEEF to finance projects identified by Energy for Londoners or the new Delivery Unit when established. This could enable large, strategic, cross borough schemes like district heat and cooling networks to be financed. Other key funds that could also be explored at a later stage and brought together include fuel poverty funding, heat network funds, Industrial Strategy Challenge Fund, Environment Agency resilience levy, future energy efficiency and resilience funds (as in NIC Infrastructure plan £500-600m per annum additional). However, these funds pose considerable challenges of ownership and regulation that would need to be overcome before they could be brought together.

For London to meet its zero carbon target there needs to be a rapidly accelerating programme of activity, starting now, to address the challenges and barriers outlined in this report. The challenges of delivering at scale, funding and financing the development of an investment pipeline, enabling and requiring boroughs to act, the need for extra powers for London and enabling working across borough boundaries need to be met quickly to ensure London stays on the pathway to becoming zero carbon by 2050. This will require more than a few tweaks to current policies and programmes but needs be transformational – not just doing existing things better, but doing better things.

The 1.5°C Compatible Climate Action Plan acknowledges that GLA programmes only deliver a fraction of what is needed and that regulation to drive private sector investment is also pivotal. However, existing programmes can be used to maintain London's progress towards a zero carbon pathway. But decisions are needed in the early 2020s. London's decision will be informed by the decisions national government makes on the UK's own pathway to zero carbon following the CCC's advice about which pathway to pursue to 2050. Evidence needs to be generated now to inform these decisions.

These decisions can and need to be delivered now. The issue is scaling up current activity to deliver the volume of activity required. This will build the market, skills and capacity required in the first step on the pathway to 2050. **The LSDC has suggested these three packages of immediate action for stakeholders which could be announced as a first step and would result in significant scaling-up of London's low carbon financing in 2020.**

These short to medium term funding, institutional and finance elements will provide the initial core arrangements for the development of a more ambitious institution called London's Future Financing Facility (LFFF), which we propose could be developed in the second phase.

A number of other short-term recommendations were developed through the workshops and research undertaken by UK100 and the LSDC. More detail on these can be found in appendix 2. These have been used to develop the LSDCs thinking on the longer-term vision. Many of these will need to be incorporated into the route map towards developing the London Future Financing Facility or as part of its functions.

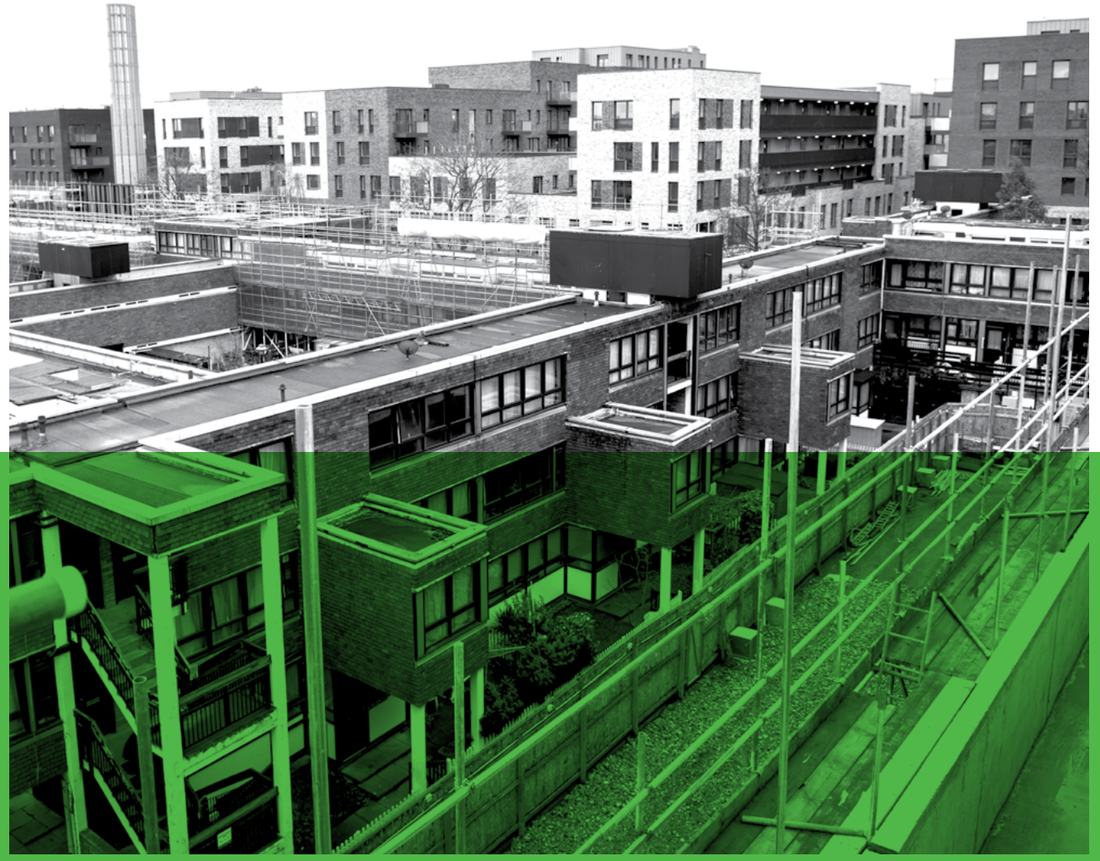
SECURE POTENTIAL FUNDING: USING CARBON OFFSET PAYMENTS TO GET US ONTO THE PATHWAY TO 2050

Carbon offset policy – application

Since October 2016 carbon offset payments have been required for all new major residential developments in London (major = more than 10 units) where the London Plan's zero carbon target for homes policy is not met. Carbon offset payments are already being used successfully by a number of boroughs across London, but a recent survey undertaken by the GLA has shown the wide disparity that exists across boroughs in implementing the zero carbon homes policy[116]. To help ensure that there is greater conformity in the application of the policy, the GLA published carbon offsetting planning guidance in October 2018.

As the new 2020 London Plan's policies will extend the zero carbon policy to all development in the capital there needs to be a mechanism to ensure that:

- All boroughs actively support the zero carbon planning policy
- That any offset payments are being fully collected for all major development applications
- There is detailed knowledge of when payments will be secured by boroughs (i.e. the 'cashflow' of payments') and also
- Best practice in how these funds are spent to fully realise carbon savings and any potential wider environmental benefits.



Box 19: TOWER HAMLETS - USING CARBON OFFSET PAYMENTS TO DRIVE LOW CARBON INVESTMENT

Tower Hamlets Council – Schools Energy Retrofit Programme

Tower Hamlets won a Local Government Chronicle award in March 2018 for its carbon offset fund. The Local Planning Authority (LPA) was especially commended for using its carbon offset payments to fund a Schools Energy Retrofit Programme. This £240,000 programme provided grants to schools in the LPA, solely from the offset fund, to reduce their energy consumption and carbon emissions, with a maximum amount of £30,000 per school. An open application process allowed schools to suggest projects for consideration by a panel. Eight applicants were selected based on expected carbon savings, additionality, and community benefits. Proposed projects included heating systems, lighting upgrades, insulation and air conditioning improvements. Five of the schools were looking to complete their projects in 2018 and expected to reduce their carbon emissions on average by 53 per cent and save an average £4,700 a year on their energy bills which can be invested in new equipment and activities instead. Further information, including on the Schools Carbon Emission Reduction Programme which was also funded using carbon offset funds, is available at: https://www.towerhamlets.gov.uk/lgnl/environment_and_waste/sustainability/Tower_Hamlets_Energy/Schools_energy_efficiency_support.aspx

Tower Hamlets Council – combining RE:NEW support and carbon offset funds

Tower Hamlets has recently undertaken a pilot scheme to replace boilers and insulate properties for owner occupiers. The aim of the pilot was to reduce carbon emissions through reducing energy consumption and thereby reduce fuel poverty. The pilot was procured using the GLA's RE:NEW framework. The RE:NEW framework is designed to help public sector organisations procure energy reduction and generation measures efficiently, effectively and economically. It reduces the time taken from procurement to installation, supports value for money, and gives assurance to buyers through pre-qualification of suppliers. The funding for the pilot was secured from Tower Hamlet's Carbon Offsetting Fund. The carbon offsetting mechanism to secure funds is included within the adopted Planning Obligations Supplementary Planning Document (SPD) (2016), which identifies that where the policy requirement for carbon emission reductions cannot be met on-site, the 'Contributions will be placed in the carbon offsetting fund and will be used by the Council to reduce carbon dioxide emissions in projects elsewhere in the borough. The council allocated £200,000 for this pilot and anticipate that more funding will be provided to deliver additional phases for a further three years.

Source: *Reproduced from Carbon Offset Funds Greater London Authority guidance for London's Local Planning Authorities on establishing carbon offset funds October 2018*[117]

Despite the GLA's recent carbon offset survey, it remains unclear however how many major residential developments in London are being required to meet the zero carbon homes policy and provide offset payments for any shortfall in emissions. Differences in the volume of carbon offset payments collected by different boroughs could arise for a number of potential reasons; policy approach to the London Plan's requirements, a lack of in-house skills and resources or local political priorities. Table 2 of the GLA's carbon offset survey illustrates the significant differences in funds being collected: further annual reports should look to gather data on the number of developments that been given planning permission in the year and where the zero carbon policy has been fully applied.

Carbon offset funds – how much is collected?

Carbon offset funds provide a source of funding for carbon reduction projects across London and have a role in funding emission reductions from existing buildings where achieving carbon savings can be more challenging compared to new build. Based on the typical performance of new build development to date, London's carbon offset funds could amount to £30-40 million annually, based on forecasts from the GLA's planning data and using a carbon offset price of £60/tonne CO_2. In March 2019, London's 35 LPAs (the 32 boroughs, City of London Corporation, London Legacy Development Corporation and Olympic Park Development Corporation) were asked to submit a response to the GLA's survey on: the value of their funds, expenditure since October 2016,

the types of projects being selected for funding and the governance arrangements that are in place to manage the fund. The table below presents the total value of offset payments collected, and payments secured by legal agreement but not yet collected, since 1 October 2016 when the zero carbon homes policy came into effect.

Total amount collected since 1 October 2016	Total amount secured by legal agreement but not collected since 1 October 2016	TOTAL
£11,219,000	£38,970,000	£50,190,000

In terms of determining future financial flows that might arise from offset payments:

- For any approved development, the offset payments may be agreed at different trigger points. These could range from full (or part) payments at the commencement of construction, staged payments during construction, staged payments during phasing of a large development, or even at and after occupancy. Understanding the level of payments being collected year on year, as well as future payments committed to by developers will allow boroughs to understand what level of resource could be available to allocate to low carbon projects.
- It is important to note that the 2020 London Plan[118] proposes that the zero carbon policy will be extended to also include non-residential major development[119]. This is likely to come into force in 2020.
- The 2020 London Plan also proposes to increase the carbon offset price payment from £60/tonne to £95/tonne[120].
- No estimate has been made as yet of the total potential of carbon offset payments likely to be collected across residential and non-residential buildings across the capital per year. The GLA annual survey will provide year-on-year analysis, however, the GLA together with London boroughs should conduct or commission analysis of the estimated levels of payments likely to be forthcoming through offset payments over the period to 2025.
- This analysis will also need to take into account that some boroughs have set their own carbon offset prices (which is allowed through the London Plan policies), as determined by their own viability assessments.

The GLA's priority is to ensure that 'true' zero carbon developments are being delivered in the capital and have indicated that the carbon offset price will be under review[121] to ensure that developers do not simply 'buy' their way out of installing onsite carbon reduction solutions.

Predicted cost reductions linked to technologies, such as solar and storage, alongside a fall in grid emission carbon factors (definitely electricity, and possibly also in natural gas – though this will likely not have any significant impact until the 2030s at the earliest) and further policy requirements for emissions savings to be achieved onsite will all contribute to the development of 'true' zero carbon buildings, and hence will also reduce the level of offset payments being directed to local authorities. Offset payments therefore are not meant to be the sole solution for funding the LFFF – in any case they will not be sufficient to meet London's zero carbon infrastructure needs. They do however provide a potential new source of funding that could form part of the investment the LFFF could tap into to help support new projects.

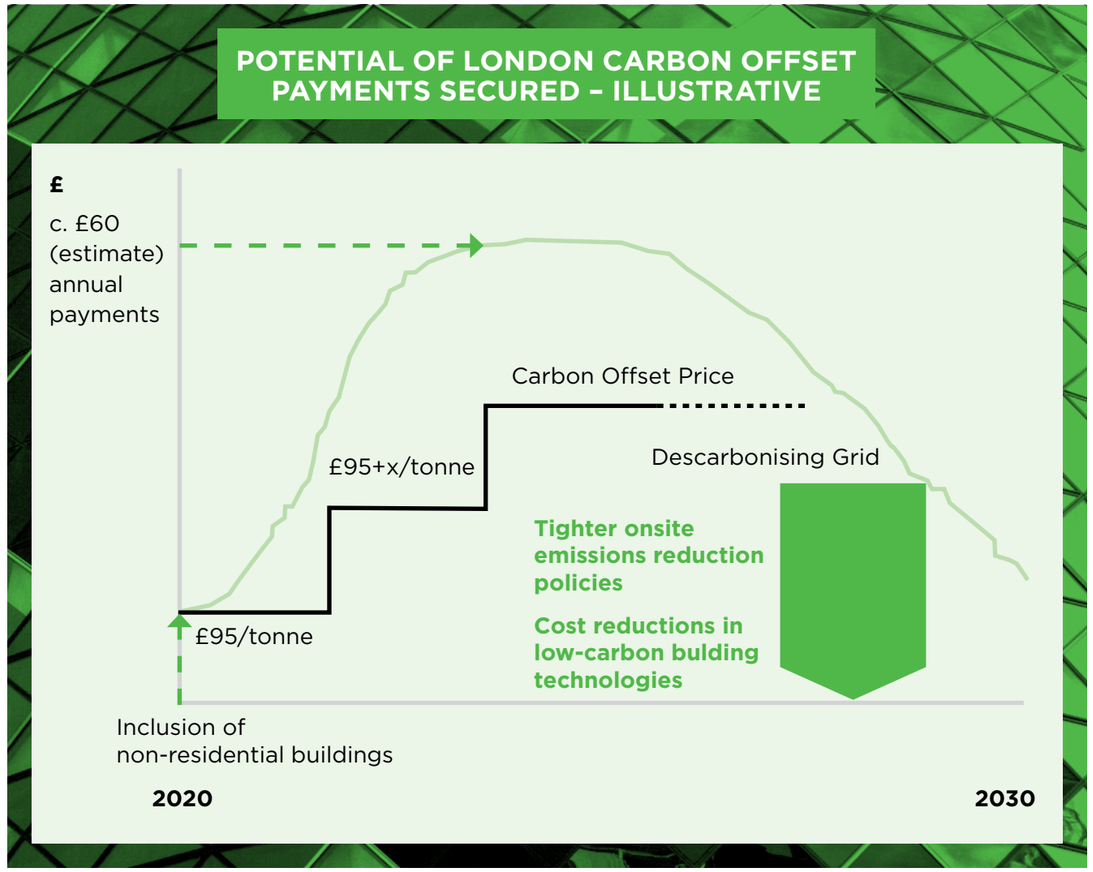


Figure 10: *Indicative Level of carbon offset payments 2020-30*

Supporting borough energy capacity to deliver

The GLA carbon offset guidance states that *'If an LPA [Local Planning Authority] determines that additional funds are needed to pay for staff to develop and manage identified offsetting projects, we recommend a maximum of 10 per cent of the fund is allocated to this, either annually or per project and this should be set out clearly in the agreement however boroughs should utilise existing resources/mechanisms first'.*

There is a need for many more trained officers within boroughs to be able to support the zero carbon planning policy and, importantly, to identify, develop and deliver new carbon reduction projects. Accessing a portion of the offset payments to recruit energy and environment staff, as set out in the GLA guidance, would allow many boroughs to build up their in-house energy expertise – not only ensuring that planning climate policies are delivered to their maximum – but also identifying key carbon reduction opportunities that could be developed through offset payments secured. An increase in staff would allow for greater opportunities for boroughs to specialise in energy skills, work sub-regionally in teams, and allow for closer collaboration with GLA support programmes to develop more ambitious projects.

INSTITUTIONAL SUPPORT: ENERGY FOR LONDONERS DELIVERY UNIT

A key issue that became apparent to Commissioners during the LSDC discussions and workshops are that there a range of GLA programmes in place to support borough action on development of district energy and on energy efficiency in public buildings and social housing with the intention to expand into the private rental and owner occupier sectors for residential buildings.

The LSDC identified that the current programmes and institutional arrangements for decarbonising London could be improved by closer collaboration between the existing GLA programmes in place and local authority energy teams. This would allow for a more comprehensive approach to be undertaken when developing carbon reduction projects.

We propose the GLA considers forming a new single 'Delivery Unit' that merges the roles of DEEP, RE:FIT and RE:NEW, MEEF and potentially other GLA energy related programmes to bring together the funding, finance, skills, support and delivery mechanisms for a low carbon London under one roof with a clear and coherent brand.

These will need to be expanded into other sectors and areas over time e.g. commercial and industrial buildings along with waste, adaptation and green infrastructure.

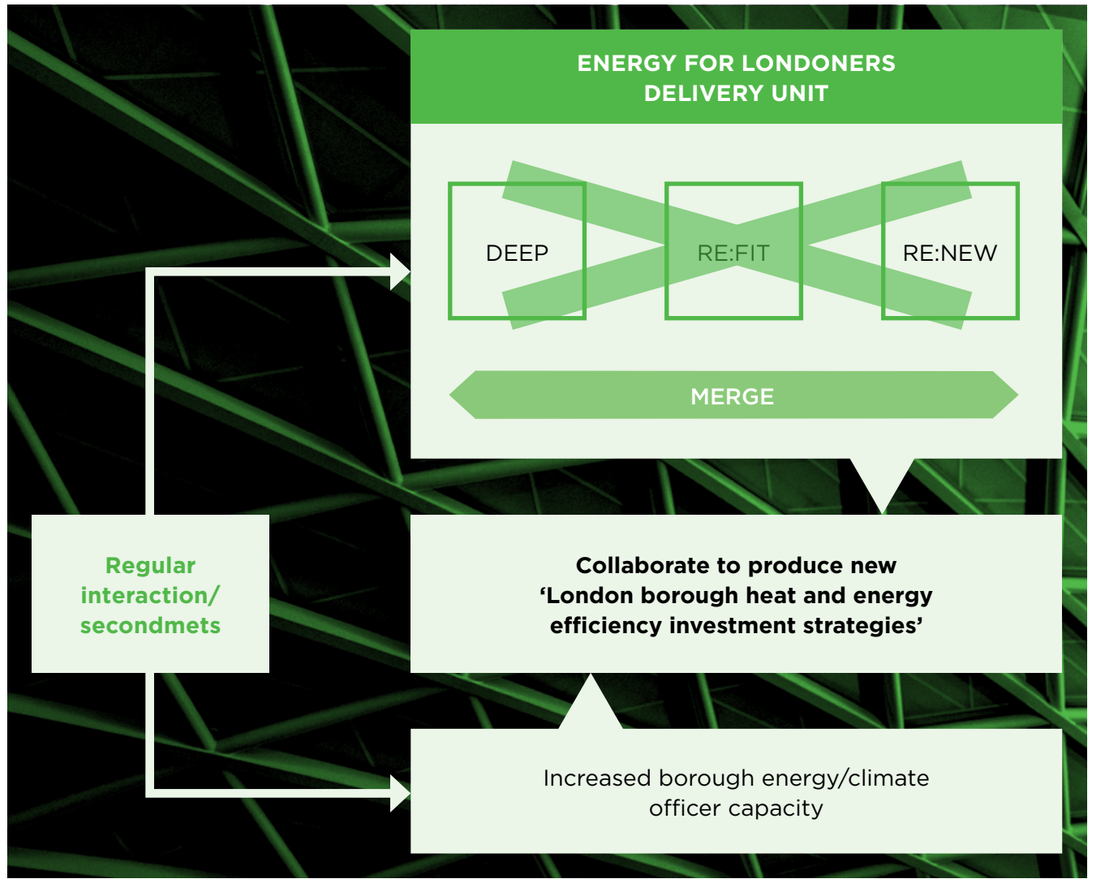


Figure 11: *New Londoners Energy Delivery Unit*

Note: The GLA has recently renamed its support programmes to: Retrofit Accelerator Homes & Retrofit Accelerator Workplaces

POOLING CARBON OFFSET FUNDS: LONDON CLIMATE INFRASTRUCTURE FUND

There is a potential to maximise the use of carbon offset payments collected by boroughs by leveraging additional finance. Some boroughs are already doing this, by matching programmes funded through carbon offset payment with additional Energy Company Obligation (ECO) funding for energy efficiency retrofit projects. There could however be an opportunity for the GLA to work with boroughs to establish a new 'London Climate Infrastructure Fund' (LCIF) (possibly as a transition from the Mayor's Energy Efficiency Fund (MEEF) or in parallel to MEEF, or if it were to continue beyond its current lifetime of 2023[122]) to bring in private sector finance to fund larger, more ambitious projects for London, some of which may be cross-borough or sub-regional, and which might require levels of investment beyond the resources of any one single borough.

This fund could be established by boroughs directing a proportion of offset funds into a larger strategic fund for London, managed and supported through the GLA Delivery Unit alongside a fund manager (similar to MEEF at the present time). The 26 London councils who signed climate emergency declarations, committed, in a joint statement in December 2019 to a recognition that to develop projects to achieve future climate goals "will require London's local government to develop innovative financial strategies that can draw in the funds to deliver these projects, including from central government"[123].

Knowing the 'flow' of future offset payments committed would allow a fund to engage with the private sector as well as ensure funding was always available for participating boroughs in the LCIF to support specific project opportunities as they come forward. There may be a need to amend S106 agreements language to ensure developers do not contest this, e.g. as revenues were to be spent in the borough.

Box 20: S106 AND CIL

The LSDC recognizes that further work is needed to test the viability of this proposal in relation to the pooling of S106 carbon offset payments. There are restrictions on the use of S106 payments which are limited to building scale solutions whilst the Community Infrastructure Levy (CIL) is designed to support larger infrastructure projects (e.g. District heating). The design of S106 and CIL regulations at present is actively geared towards preventing charges from developers; being repeatedly pooled, being collected via different routes (e.g. S106 and CIL) being directed towards the same project. Once the planning regulations relating to S106 pooling are relaxed or removed (from consultations we know that this is the intended direction of travel) then the combination of CIL and S106 could become less problematic. It is not clear at present what the nuanced interpretation of these changes will allow in relation to the creation of a 'London Climate Infrastructure Fund' from developer contributions.

The LCIF would be flexible in that it could simply hold the offset payments for a borough, with the borough drawing down funds as needed. It could also manage and direct payments to projects most in need at any particular time i.e. lending to a specific borough which may have a particular time-sensitive project, but not the money available to progress, and securing any loan against future guaranteed offset payments that a borough has agreed. The LCIF could perhaps ensure that any boroughs payment into the fund would always be protected and be able to be 'withdrawn' at any time requested. Or the LCIF could be compartmentalised for each borough so it acts as a holding fund for them and a way for the LFFF to leverage additional funds.

The key benefit however would be that the LCIF would have the appropriate skills to leverage in additional funds against payments held and future guaranteed payments projected to come through.

LCIF could also provide project finance to more ambitious cross-borough boundary projects. This would ensure effective and timely use of funds by allocating to projects coming forward across London so boroughs are not limited by the 'cash-flow' of offset payments expected. The fund could also use funds to deliver innovative projects – such as low interest loans to Londoners for home retrofit projects (less transaction costs in a single entity performing this task). As carbon offset funds increase, it is possible that boroughs would prefer to have funds off their balance sheet.

Other key funds that could also be brought together but would need to be tested further in terms of the challenges pooling would pose are fuel poverty funding, heat network funds, Industrial Strategy Challenge Fund, Environment Agency resilience levy, and future energy efficiency and resilience funds (as in NIC Infrastructure plan £500-600m per annum additional).

DEFINING THE ROLE OF THE LONDON FUTURE FINANCE FACILITY

The London Future Finance Facility (LFFF) is ambitious and world-leading. Any such proposal will face resistance in terms of deliverability. There will be many detailed decisions about the design, governance and establishment of the LFFF that are beyond the scope of this paper. **The LSDC has focused on developing the case for the need for the LFFF and outlining the basic feasibility of delivering such an institution.**

The LSDC considers a new institution of the scale and ambition of the London Future Finance Facility necessary to meet London's triple challenges of growth, inclusion and environmental sustainability. The alternative would be to attempt to integrate climate and environmental issues in a "bottom-up" way throughout existing planning, infrastructure and funding programmes. **The LSDC asked its consultants (UK100) to consider the option of further incremental integration of programmes as an alternative to establishing a new institution. Based on this research and evidence from stakeholders the LSDC did not consider incremental reforms a reliable and effective basis for financing London's future.**

The LFFF should have a mission **to deliver the investment London needs to thrive in a net zero and climate-changed world.** It should combine cutting-edge practice from around the world in driving clean and resilient investment with a distinct London approach to supporting disadvantaged communities and creating jobs for all. This mission would be expressed through four priority objectives:

1. Securing of a flow of investment by the mid-2020s which is of sufficient scale and quality to meet the needs of London's revised 1.5°C target/Climate Emergency/ Climate Action Plan and addresses resilience and wider environmental challenges.
2. Ensuring all parts and communities of London enjoy the benefits of a green transition and 'inclusive growth' – building on the London Plan and Industrial Strategy – including through access to new jobs, local community ownership and control, and protection from local climate change impacts.
3. Maintain and grow London's role as a global centre for the "green economy". Maximise the opportunities for existing and new London-based businesses to benefit from these fast-growing global sectors and to support London's climate and environmental transition.
4. Demonstrate the efficiency, effectiveness and value of integrated climate and environment financing at the London-level in support for the Mayor's campaign for more powers and control of public financing.

The LFFF would be rooted in well-developed "green banking" practice – not least the legacy of the UK Green Investment Bank and best practice examples from around the world. The LFFF would have four distinct functional pillars:

- **London Future Finance:** a bespoke green/sustainability banking facility for London which can, for example: offer bespoke financial instruments for supporting London's priority clean and resilient investment needs e.g. de-risking instruments; aggregate smaller projects into financial bundles for efficient refinancing; issue green/sustainability/ resilience bonds to tap into the deep pools of institutional finance in London; and be able to pool and leverage different pots of public funding (e.g. efficiency retrofit, heat networks, smart systems, flood defence and innovation/ industrial strategy). This facility could eventually issue "citizens green bonds" – a retail product considered by the UK GIB – to enable Londoners to invest directly in their city's transformation.
- **London Future Infrastructure:** a specialised project and programme development capacity which can support boroughs and other London institutions in developing at scale pipeline financeable projects and infrastructure systems. This would include supporting the demonstration of new integrated infrastructure solutions through innovative "clean energy zones"; as supported by the BEIS Industrial Strategy Challenge Fund. The functions could expand over time as the climate transition deepens to: work with existing regulated infrastructure providers, regulators and TfL to trial new approaches and combine financing streams e.g. on smart systems, efficiency and storage; and, develop sustainable management and support structures for London's critical "green" and "blue" infrastructure systems e.g. natural flood defences and SuDS.
- **London Future Jobs and Communities:** capacity to ensure all Londoners benefit from the clean energy and climate transition by directing financing to traditionally excluded groups and communities, and maximising job opportunities in London that come from replacing external energy purchases with clean investment in the capital. Key activities in this pillar would include: using local skills and training budgets to ensure adequate local capacity to deliver large-scale energy efficiency retrofit and clean energy programmes; supporting disadvantaged communities and groups to access the benefits of clean energy technologies and resilience programmes e.g. on local cooling solutions; and, developing a comprehensive "just transition" plan to support workers displaced by the clean energy transition e.g. in fossil vehicle and gas boiler maintenance.

- **London Future Markets:** a facility to accelerate the development of sustainable markets for clean technologies in London, providing market pull and underpinning support to help grow the industries of the future. This would provide a single point for accessing growing public financing for priority UK clean industries such as sustainable construction, artificial intelligence and data analysis and services. Activities in this area would include: supporting the formation of large-scale London based corporate purchasing groups around renewable energy, electric mobility and sustainable food; working with GLA, TfL, boroughs and London-based infrastructure providers to generate at scale procurement clubs for low carbon construction and goods – building off the successful example of the 2012 Olympic Park; and, supporting SMEs and new businesses based in London to meet the growing demand for sustainable goods and services, including through the full development of London's CleanTech hub planned for White City.

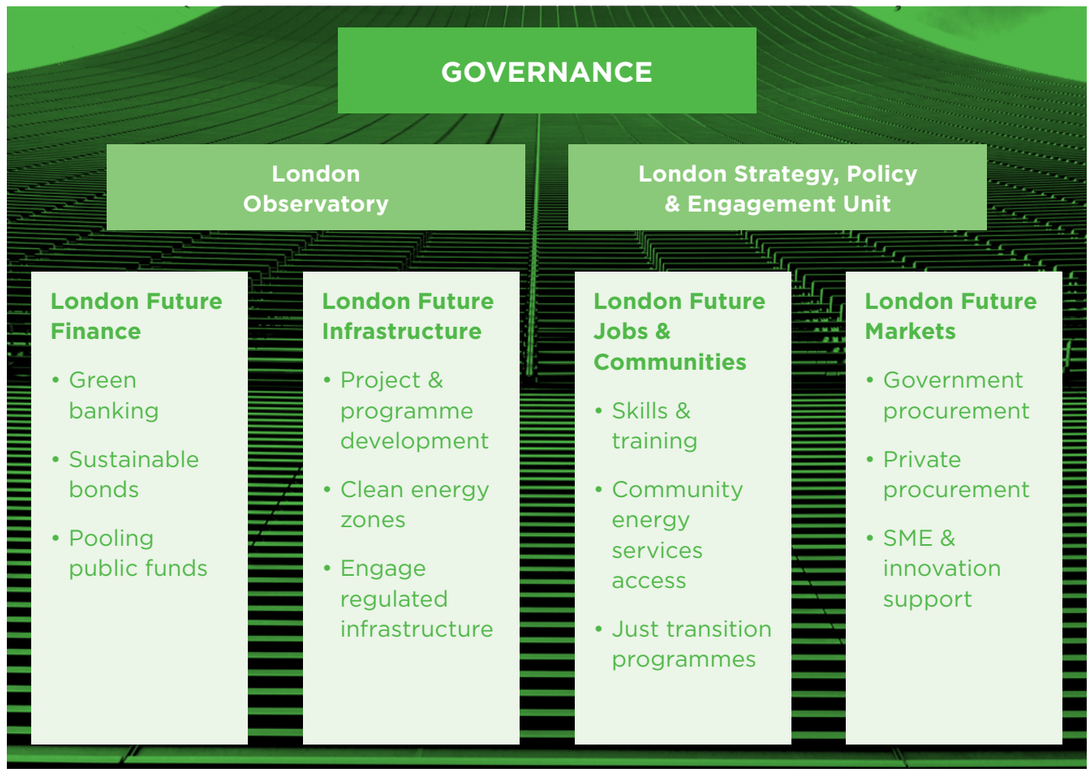


Figure 12: *The four pillars of the proposed London Future Finance Facility*

These four pillars of the London Future Facility would be complemented by two horizontal functions to ensure a joined-up approach and integration with wider national and London policy and programmes:

- **London Future Observatory:** generating a real-time comprehensive overview of London's future integrated infrastructure system needs and capabilities (financing, companies, supply chains etc.) consistent with 1.5°C future.
- **London Future Strategy and Policy:** a small unit focused on ensuring consistent strategy across the pillars and to engaging with central government and regulators to make the case for specific devolved powers, national regulatory reforms and financing reallocation to support London's future needs.

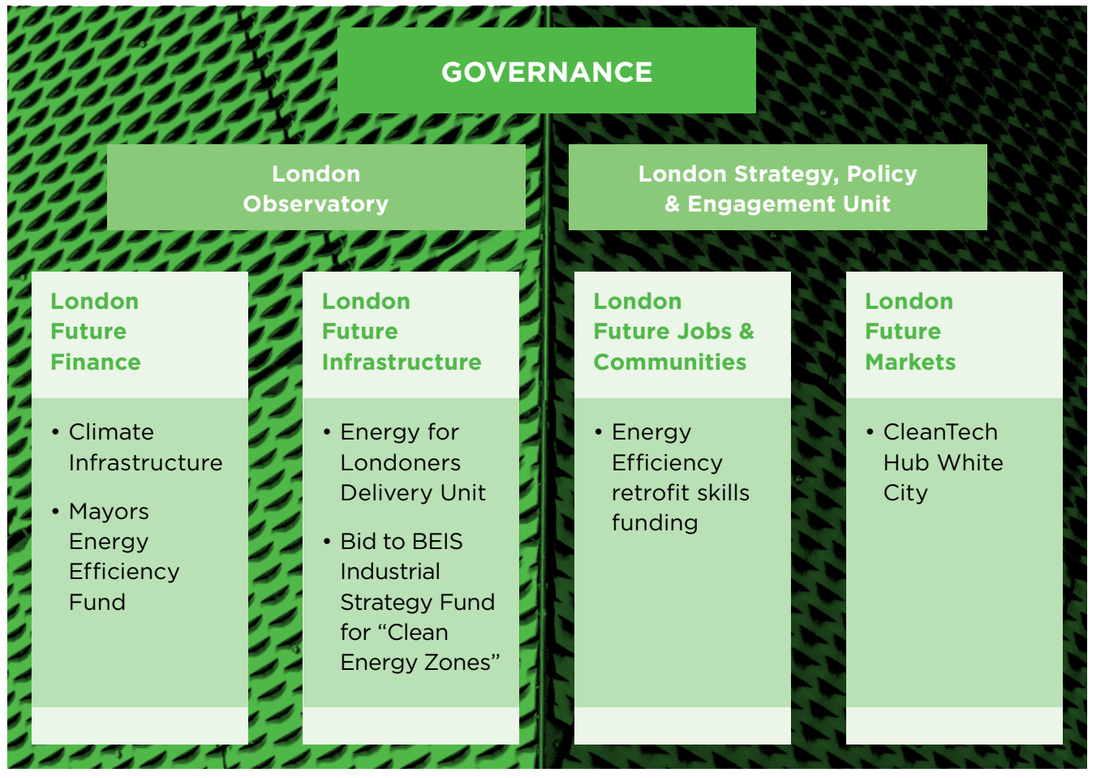


Figure 13: *The four pillars proposed for the LFFF and the short terms recommendations*

Examples exist of all the functional elements described above; however, their combination into one integrated Facility would be a global first. Many of the resources needed to support this new institution already exist in London or are likely to become available as the UK deepens its decarbonisation plans and releases more public finances into this space, such as the Mayor's arms-length institution "Funding London". The problem in delivering this vision is not so much in finding "big money", significant resources exist in the public and private sectors notionally allocated to low carbon and resilient solutions which are currently underspent (for example, London captures a relatively low proportion of Energy Company Obligation (ECO) funding, a lot less than its fair share).

The challenge is to creatively use much smaller amounts of facilitation resources and capacity more effectively to unlock major financial flows towards London's needs. This report has identified several areas of existing funding which could be rationalised to form the foundation of London Future Finance Facility (e.g. MEEF) and flows of future funding from low carbon offset payments which could support scaling-up.

When considering deliverability, it is useful to compare the London Future Finance Facility to similar scale institutions elsewhere. The UK Green Investment Bank went from concept to fully funded bank with £3.8bn in capital in 24 months[124] and was releasing funding as a "shadow bank" before that. Project development facilities have been established by several development banks and the EIB recently established an infrastructure advisory hub[125]. Scotland, with an economy far smaller than London, has decided to establish the Scottish National Investment Bank (SNIB) with a specific focus on driving the low carbon economy, innovation and SMEs. The Nordic countries with a significantly lower population than the UK's 26 million have a dedicated Nordic Investment Bank with a mandate to support environmental and resource efficient investment. In the US, States as small as Connecticut and even Montgomery County in Maryland have established viable and successful green investment banks. **Based on discussions with those involved in developing comparable institutions around the world the LSDC sees no practical barriers to developing an institution of the scale and scope of the London Future Finance Facility given the depth of wealth, capacity and opportunity in London.**

London has the resources, capabilities and capacities to build a successful and transformational London Future Finance Facility. The question is whether there is the political will to prioritise this new institution and developing a practical roadmap for its delivery. **The LSDC does not believe that the London Future Finance Facility needs to be delivered tomorrow, but it does need to be operational in the early 2020s. In the next section, the LSDC lays out what we believe is a practical but ambitious approach to delivering immediate change based on existing institutions while laying the foundations for a step change in quantity and quality of investment in the early 2020s.**

Box 21: GOVERNANCE ARRANGEMENTS

The LSDC has not suggested a governance structure at this stage as there is a recognition that additional detailed technical, political and financial feasibility studies are needed to develop these ideas further. Key stakeholders both within the GLA and externally including boroughs, the finance and infrastructure communities will need to be brought together to develop the right governance structure to develop the LFFF.

For this to be a viable long term politically neutral organisation and structure, key stakeholder buy in would need to be achieved so anything that is set up is not immediately dismantled by a future Mayor.

A ROADMAP TO DELIVERING THE LONDON FUTURE FINANCE FACILITY

The London Future Finance Facility would represent a major increase in London's capacity to deliver on its sustainability goals. Activity is underway in London on nearly all of the areas highlighted as core functions but it is fragmented and below the scale needed to deliver the necessary change. As already highlighted the LSDC believes that successfully delivering the vision of the London Future Finance Facility will depend on three key factors:

- The support of the Mayor of London for this bold and innovative approach
- Active partnership with a critical mass of boroughs who agree to pool resources with the GLA
- Ability to pool resources across the GLA family and access significant new national public funding sources as they become available

The report has identified several practical steps which the GLA could implement immediately which would improve sustainable financing of innovative projects - especially on energy efficiency and clean energy – in London, demonstrate benefits of more concerted action and so lay the foundations of the London Future Finance Facility and London's ability to make a strong case for more money and powers being transferred from central government.

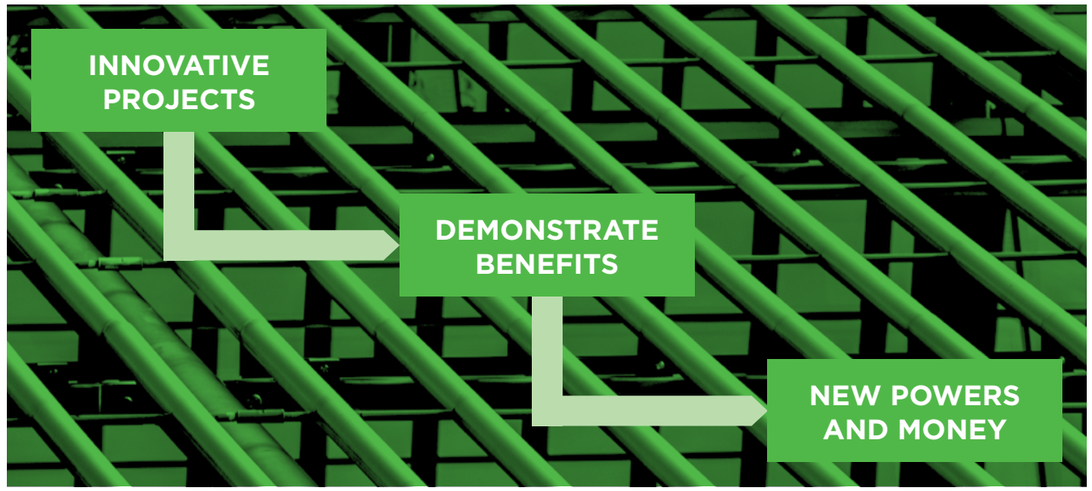


Figure 14: *Route map overview*

We propose **a roadmap to the development of a full London Future Finance Facility** as follows:

- **March 2020:** As a core element of his response to the climate emergency the Mayor announces in principle support for considering the LSDC proposal for a London Future Finance Facility and commitment to establish a **taskforce** of financiers, boroughs and experts to consider the LSDC's recommendations and deliver a detailed design and plan for the LFFF by December 2020. This will include linking to national work such as the Government's Green Finance Strategy and HMT Zero Carbon Review[126].
- **Mid 2020:** Green Finance Taskforce is established by the Mayor and starts work.
- **Q2-Q3 2020:** Taskforce will work with boroughs, utilities and private financial institutions, as well as engaging with central government, to explore potential joint resources and other funds that could support development and delivery of projects, including relevance of devolution of powers and finance. This could include investing in or alongside MEEF as a starting point.

- **Q4 2020:** In time for Glasgow COP26, a recommendation report to be published by the taskforce covering key barriers – and how to overcome them - to delivering large-scale carbon reduction programmes and raising finance for them, the structure of a new institution and how that new institution could address these issues.
- **2021:** Decision taken by the Mayor on detailed design and establishment of London Future Finance Facility based on taskforce report. Engagement with central government on core funding as part of future spending reviews for establishment in the early 2020s and establish a mechanism for accessing "London's share" of national climate change related funding streams, for activities around heat, energy efficiency, electric vehicles, clean energy, etc.
- **2022:** The facility begins operating by incorporating existing funds from a combination of public and private sector sources. It begins to implement a 3-year business plan to scale up investment and activity across both public and private sectors to meet London's carbon budget for 2028-32.

7

Next Steps

THE OPPORTUNITY

The LSDC is actively seeking support for the recommendations contained within this report to transform London's pathway to zero carbon in a just and sustainable manner, harnessing the power of both our public institutions and private capital flows in a unique proposition.

This report has outlined clearly the evidence for action and suggested a path forward. Engaging with the development of the London Future Finance Facility through the LSDC is an opportunity to:

- Shape and develop the GLA's vision for the London Future Finance Facility from the beginning
- Help create an environment for low carbon circular economy projects and investment to flourish

If you are interested in finding out more and meeting with the LSDC and its partners, please contact:

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List of acronyms and definitions

The report contains several acronyms which are named in full where they first appear in the document. The list below reflects the primary acronyms for ease of reference. Where necessary, a short description has been added to the acronym to describe its meaning as used in the context of the report.

BEIS
Department of Business, Energy, Innovation & Science

CCC
Committee on Climate Change

CCS
Carbon capture & storage

CIL
Community Infrastructure Levy

COP
Carbon Offset Payment

DEEP
Decentralised Energy Enabling Project

DEPDU
Decentralised Energy Project Development Unit

DH
District heating

DHNB
District Heating Network Body

ECO
Energy Company Obligation

EIB
European Investment Bank

EIZ
Energy Innovation Zone

ELENA
European Local Energy Assistance

EfL
Energy for Londoners

ERDF
European Regional Development Fund

EU
European Union

EV
Electric vehicle

FiTs
Feed-in Tariffs

GDP
Gross Domestic Product

GFI
Green Finance Institute

GFT
Green Finance Taskforce

GIB
Green Investment Bank

GLA
Greater London Authority

HA
Housing Association

HNDU
Heat Network Development Unit

HNIP
Heat Network Investment Programme

LA
Local authority

LB
London Borough

LEEF
London Energy Efficiency Fund

MEEF
Mayor's Energy Efficiency Fund

LSDC
London Sustainable Development Commission

R&D
Research & Development

PRA
Prudential Regulation Authority

PWLB
Public Works Loan Board

S106
Section 106 agreements

UNEP
United Nations Environment Programme

Appendices

APPENDIX 1: ISSUES AT DIFFERENT STAGES OF PROJECT DEVELOPMENT AND DELIVERY

Concept: This requires the gathering of data and the development of practical approaches to deliver desired outcomes. The private sector may be willing to devote some research and development (R&D) funding at this stage, but only if it sees that a clear potential commercial opportunity might emerge from this work. If government at all levels wants investment to occur it needs to support this through gathering data, funding R&D and supporting pilot projects to demonstrate commercial viability.

Development/Commercialisation: private sector developers will only be willing to fund development once they see a clear commercial opportunity which enables them to assess its risks and rewards. There will typically be a large number of risks associated with a project proceeding (and a consequent high failure rate), so they will ration their financial exposure at this stage and expect a high return for this funding to be generated by the projects that do succeed.

Development costs for large scale district heating projects are typically in the range of 10-15% of overall capital costs and 2-5% for more straightforward energy efficiency projects.

Government funding support is needed at this stage to develop commercial opportunities which can deliver the desired outcomes, whilst presenting sufficiently attractive risk weighted returns for private capital to invest in once the commercial models have been created.

Standardisation of contracts and procurement approaches can significantly reduce project development costs and, by reducing market barriers to entry, help to increase competition thereby reducing overall project costs.

Creation of an investable project may enable the developer to recover its development costs by selling a part or all of its interest in the project at this stage, allowing a next stage developer to build out the project.

Construction: once a clear commercial framework has been created developers, and the private capital they need to support their development, can assess the risks they will be taking, the ways in which they can mitigate these risks, and the return they require for taking the residual risks they are left with. The key risks will revolve around:

- certainty of cost to complete the project
- timing to complete (including planning)
- technology risk and will it work?
- operating costs and their variability
- predictability of revenues
- interest rates
- policy and legislation (including planning)

Operation: completion of construction and proven generation of revenue usually reduce a project's risk profile. This enables private capital to accept a lower return on its investment, and often provides an opportunity for the initial construction investors to realise a capital gain on their initial investment by bringing in new investors who will accept lower returns for this reduced risk profile.

Infrastructure projects with stable long term cash flows are attractive to pension funds who seek long term income streams to match their pension liabilities.

Bond markets can provide competitive long term debt finance but the underlying credit quality needs to be high and for £ denominated bonds the issue size generally needs to be at least £250m to provide access to the cheapest rates.

For markets which involve smaller project sizes than this it may be possible to aggregate projects, so they provide a relatively homogeneous pool of assets which can be financed under a single bond issue but they will have to demonstrate very similar credit characteristics.

For equity, the growing market of infrastructure equity investors provides an increasing pool of potential investors for opportunities that can demonstrate the right risk/reward characteristics.

APPENDIX 2: SHORT TERM RECOMMENDATIONS FROM WORKSHOPS AND RESEARCH UNDERTAKEN BY UK100

- Recommendation 1: Create Energy Transformation Districts
- Recommendation 2: Create London Clean Energy Team
- Recommendation 3: Make the business case for replacing project development revenue sources that currently come from the EU
- Recommendation 4: Consider how the GLA can best work with boroughs to ensure best use of the current potentially available revenue streams, such as ECO, CIL and COP, to support the development of a much larger pipeline of low carbon projects
- Recommendation 5: Consider other forms of revenue raising powers and work with other UK municipalities to lobby Government for desired changes to municipal powers
- Recommendation 6: Consider how best to deploy public funding in support of project development in order to attract private development capital as early on in the process
- Recommendation 7: Explore potential to develop LA backed green bonds which can be sold to individuals

- Recommendation 8: Convene a meeting of London local government pension fund managers (including London CIV) and finance directors to explore the basis on which London's local government pension funds can help to finance London's required clean energy investment
- Recommendation 9: Create an equity investment management capacity to ensure that the GLA receives an appropriate equity investment for any financial support that it provides for heat networks, and the capacity to realise equity gains and to influence a consolidation of London's heat network system as it matures over time
- Recommendation 10: The GLA should hold an early meeting with the Green Finance Institute (GFI), following publication of its inaugural report in March/April 2019, to explore the scope for offering London as a test bed to develop solutions to accelerate clean energy investment in the city, which may have broader UK application once developed.
- Recommendation 11: Create a large-scale programme for deep energy efficiency retrofit, to take existing homes to a 2050 zero carbon standard
- Recommendation 12: Model the costs of achieving 2050 targets, if EPC A+ or better was mandatory for homes by 2050 or earlier
- Recommendation 13: Consider how the Mayor or Central Government (supported by appropriate business cases) could help to accelerate the rate of energy investment in the private housing market
- Recommendation 14: Develop the business case for tighter regulation and fiscal incentives to increase demand for nondomestic energy efficiency retrofit investment
- Recommendation 15: Establish a District Heating Network body (DHNB) to develop £250-350m of heat network projects over the next five years, which includes sufficient resource to carry out this work, with appropriate governance to drive a focus on project development
- Recommendation 16: Ensure that DHNB has the capability to capture £50-£60m share of the Government's £320m Heat Network Investment Project (HNIP) fund and working with MEEF maximise the private sector investment
- Recommendation 17: Create an equity investment management capacity to ensure that the GLA receives an appropriate equity investment for any financial support that it provides for heat networks, and the capacity to realise equity gains and to influence a consolidation of London's heat network system as it matures over time
- Recommendation 18: Continue to push for devolution of ECO to GLA, include 'uplift' for London properties. Government has recently devolved control over ECO funding in Scotland to the Scottish government. A similar action should be undertaken for London.

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