View of the City of London.
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Climate Adaptation Governance and Finance in London

GETEC Master
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SciencesPo
URBAN SCHOOL

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Figure 1. Q & A at London City Hall. © 2024 Valentin Salperwyck.

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Introduction

Hannah Vanderstappen

The environmental, economic, and social threats of climate change are no longer merely a certainty but a reality. According to recent UN predictions, current policies are taking us on a warming pathway of between 2.5 and 2.9°C, well beyond the 1.5°C warming warranted by the Paris Agreement. While in the past Europe was thought to be shielded from the worst effects of climate change, today, the World Meteorological Organisation has confirmed that Europe is warming faster than anywhere else. Climate change impacts in Europe and across the globe have been increasing each year in frequency, severity, and duration, often culminating in hazardous conditions. So far, city policies following a global trend have focused on mitigation strategies that aim to reduce the impacts of climate change by containing emissions. While it remains crucial to bolster efforts to reduce greenhouse gas emissions, the impacts of climate change are no longer avoidable, and governments at all scales have an imperative to adapt to climate change impacts now. Adapting cities to climate change consists of minimising the exposure and vulnerability of cities, their infrastructure, and inhabitants to climate-related risks.

Cities host the majority of the world's population and contribute to a significant share of emissions. However, by virtue of their innovative and experimental potential, they play a crucial role in climate change mitigation and adaptation strategies. In the face of reluctant national governments, many cities have committed to their own net-zero targets. Yet adaptation actions have fallen short so far. The particularities of cities make it essential that they invest in adaptation because climate change has an outsized impact on cities. There has been a recent turn, although slow, towards increasing adaptation efforts. Networks, such as C40 Cities and CPI, play a key role in promoting and facilitating adaptation actions in cities and encouraging the sharing of best practices.

However, implementing adaptation policies in cities is extremely challenging due to the institutional and financial constraints cities must tackle. Cities are bounded financially and politically by their national governments. The current financial landscape exacerbates adaptation barriers. While many cities are constrained in their power to act due to a lack of capital, the private sector lacks incentives to engage in adaptation financing. This has resulted in an adaptation financing gap in cities, with most investments today geared towards mitigation strategies. The financing of adaptation policies in cities raises many questions regarding social justice, adding another layer of intricacies to the issue. The political, economic, and social settings within which cities are embedded have the potential to fuel as much as constrain adaptation.

To delve into the intricate challenges of financing adaptation in cities, our class—students in the master's program Governing Ecological Transitions in European Cities (GETEC) 2023-2025—undertook a study trip to the global financial hub, London. By meeting with both public and private sector representatives there, we began exploring the diversity of financial tools available to cities and the challenges and opportunities faced by these actors.

London's status as a global financial centre and attractive city has recently been challenged not only by geopolitical factors such as the cost-of-living crisis and Brexit, but also by a series of extreme weather events. These events have imposed significant monetary and social costs on the city. The July 2021 flash floods resulted in an aggregated cost of over £100 million and displaced many people—notably

the most marginalised. Consecutively, the summer of 2022 brought about a severe heatwave with temperatures reaching above 40°C a few months after the Climate Change Committee had assured a low chance of temperatures reaching 40°C in London before 2050. These extreme weather patterns will increase in frequency. Their unexpected intensity is proof of the importance for the city to act now to minimise social and economic costs. The UK Climate Change Risk Assessment of 2022 hypothesised that climate change in a 2.5°C warming scenario would cause damages exceeding £1 billion per year in 2050.

In complete antagonism to the UK's predicted climate risks, climate adaptation policy in the country has been marginalised. The current climate in the UK, characterised by regular austerity measures, including increasing marketisation and the privatisation of public services, combined with an aversion of the current conservative government to act on climate change, has constrained the London City Government's institutional and financial capacities to implement adaptation policies. Climate adaptation policy in the UK has so far laid dormant primarily under the sovereignty of the national government (Kythreotis *et al.,* 2020).

However, the Mayor of London, Sadiq Khan, has begun dedicating more importance to climate change adaptation in the city. Recognition of the imperative to act on adaptation is emerging. The London City Government has recently consolidated their commitment to climate change adaptation through the London Climate Resilience Review. The publication assesses London's vulnerabilities and gives recommendations to ensure the city's resilience to current and future climate change impacts. In promotion of this review, Khan stated that "the increasing frequency and intensity of these [extreme weather] events and a lack of action by the government has left our city—and nation—vulnerable to extreme weather." The interim report was published in February 2024, a few weeks before we embarked on our study trip, and framed our preliminary perceptions. The review adds to several pre-existing Mayoral programmes, including the Environment Strategy and the London Plan. It is, however, the first programme with marked attention to adaptation.

Nevertheless, finance for adaptation continues to be lacking in the city. The Mayor's Green Finance Fund remains solely dedicated to mitigation efforts and net-zero projects. A new Green Finance Fund Facility was launched which establishes the City Government's decided turn to the private sector to finance its future projects. The focus of the new version of the fund dedicates particular attention to the necessity to unlock private finance.

The students in the Urban School Master's program Governing Ecological Transitions in European Cities (GETEC)—Class of 2025—travelled to London from February 13 to 16, 2024 to explore the governance and financing of climate adaptation policy in London. Several overarching research questions initially framed our trip: *What climate risks does London need to adapt to? What financing tools are being pursued to implement these policies? What is the role of the public and private sector?* Throughout our meetings with actors, many other questions arose as we familiarised ourselves with London's landscape and uncovered the current political and financial constraints. These included: *Why is the public sector so constrained in financing adaptation? Is the private sector the miracle solution it is often painted to be? How can we upscale public finance and empower the public sector? Do we need to go beyond traditional public-private finance debates?*

These combined questions framed our reflections and research, through which we hope to establish the key challenges we

identified in our trip and challenge traditionally entrenched assumptions. With this report we hope to introduce critical thought into the adaptation financing discourse, opening the door for imagining alternative solutions and futures.

Chapter 01 aims to provide a broad overview of adaptation and finance in London and the discourses that have framed this landscape to set the overall scene within which we attended our field trips. Section 1 focuses on climate adaptation and section 2 establishes the key issues with finance in London today. By identifying and understanding the key topics, we want to shed light on the intricacies of the current climate and begin exploring some key questions.

Chapter 02 introduces the various actors we met during our trip and the main questions that emerged progressively that framed our critical positions. To emphasise their diversity, we divided the chapter in 3 parts. Part 1 introduces our encounters with London's public actors: representatives of the London City Government (section 2.1.a.) and of Walthamstow Wetlands and the Thames Estuary 2100 (section 2.1.b.). In part 2 we introduce the two private sector actors we met: Thames Tideway Tunnel (section 2.2.a.) and Bankers Without Boundaries (section 2.2.b.). Finally in part 3 we introduce a consultancy network and an international organisation: CPI (section 2.3.a.) and C40 Cities (section 2.3.b.). The chapter does not act as a mere summary of our field trips but aims to construct the foundations of our report's research questions and positions.

Chapter 03 expands the scope of our trip by advancing broader discourses on climate adaptation financing. Each section delves into a main critique and/or observation regarding climate change adaptation financing. In section 3.1 the promise of private finance as a new income stream is scrutinised by exploring the key challenges in achieving this promise. Section 3.2 analyses the challenge of capturing financial flows for cities particularly regarding tax evasion, a key issue in London. Considering this, section 3.3 argues for the financial re-empowerment of the public sector through for example democratisation and transparency mechanisms. In a final section, 3.4, multi-stakeholder urban governance is pushed forward as an alternative to climate adaptation finance to achieve social justice.

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The Guildhall, historic headquarters of the City of London Corporation.

Right: The Armorial Bearings of the Company of Merchants of London trading in the East Indies, 1600-1709. Source: The East India Company

PROLOGUE

The Evolution of London as a Global Financial Hub

Mateo Gomez

To avoid working in a vacuum, it is essential to understand how we got to where we are. Thus, a prologue through the City of London's history, from its dark origins as a financial centre to today's deregulatory machinations, is necessary.

London has always been important. Since its foundation by the Romans in 47 A.D. to today, it has been an economic centre of varying importance, but a centre, nonetheless. Throughout the Middle Ages, it fulfilled one of its purposes as a city: to be a marketplace for merchants. Despite England's tumultuous mediaeval history, it remained a centre of trade and commerce and a political centre, which lent more and more economic importance to the city.

The real birth of London as a financial hub was during the mid-XVI century. The timing is not innocuous: the city was born at the same time as—and also thanks to—English colonialism (Lemaire, 2023, May). If we must choose a year, 1551 is arguably the best choice. That year, the Company of Merchant Adventurers to New Lands was chartered in London and rechartered in 1555 as the Muscovy Company. It was the first major joint-stock company in the world and, by extension, the first proto-corporation (Goldsmid, 1886, pp. 101-112). The idea of a joint-stock company was to pool investor resources to finance the costly expeditions far away from the Isles. More followed soon after the infamous East India Company was chartered in 1600, the Royal African Company in 1660 (notorious for dealing in slaves), the South Sea Company in 1711, and so on. These commercial enterprises were spurred because exploration and colonisation were a perfect fold for finance: incredibly expensive and incredibly risky, but if successful, yielders of colossal returns. Thus, the basis for London finance was born. From there, London finance would never stop growing. The importance of finance in the city increased with the establishment of stable and self-sustaining colonies. Corporations could now turn to even more lucrative enterprises by satisfying the insatiable demand worldwide for goods such as sugar, tobacco, cotton, and enslaved Africans.

Moreover, back in the Square Mile, the deals were too good for investors to pass up: they would gladly purchase stocks of companies that had monopolies granted by the state and had the backing of the British Navy (Lemaire, 2023, December). Returns were soaring. Furthermore, to protect themselves against the persistent risks of shipwrecks, slave revolts, and other annoyances, an insurance market emerged parallel to colonial companies, chief among them, of course, Lloyd's, initially an expert in maritime insurance (Marcus, 1975, p. 192).

During the XIX century, City finance grew in accordance with imperial growth and expansion. Nothing stopped the train from rolling. Despite the bankruptcies (EIC, SSC) and the economic and financial crises (1873, 1929), London remained too important, too large of a source of money for any obstacle to make it fail. Attempting to capitalise on the spillover effect, more and more companies offering financial services huddled together in London, close to each other but also close to Westminster, and along with it, a specific legal framework and specific non-financial institutions took form and grew in importance. In a way, London as a centre of finance had become, over the course of centuries, too big to fail.

Taking Off: The Post-War City

Britain's colonial Empire started to crumble after the Second World War. The decline threatened the City, which was, after all, the financial beating heart of the Empire. However, the threat of imperial downfall was not entirely existential: throughout the XIX century, London had diversified. It was no longer just about investors trading stocks of joint-stock companies that traded in colonial goods; there

was now a solidly implanted banking industry (the Bank of England had, since its inception in 1694, the monopoly over joint-stock company financing), a large insurance industry, trades in bonds and significant investments in the nascent European industrial revolution (Kindleberger, 1974). What did represent a significant, perhaps even existential threat to the City, though, was the Bretton-Woods system of 1944, since it entrenched the US dollar as the dominant currency, displacing the until then all-mighty sterling pound, the foundation of London's banking system. To counter this decline, two phenomena were purposely put into place: first, perhaps surprisingly, the British financial system remained deregulated, despite 1929, the war, the labour government, Keynesianism, and the opposite worldwide trend (Hansen, 2014, pp. 617-620). Secondly, to adapt to the new world order, the City came up with a brilliant innovation in 1955: Eurodollars (Schenk, 1998, p. 1).

Eurodollars are deposits in US dollars that are not in the United States. The legal underpinning of the system in London was (and still is) as follows: banking activities on behalf of non-residents carried out in foreign currencies were not of the jurisdiction of British regulating authorities. Dollars then flooded the Square Mile and started being traded there, in clear violation of the Bretton-Woods fixed rates, outside of US control, and for that matter, British control, right under everyone's noses. This breach started a long tradition of dirty money in the financial centre. The first dollar bills of the green downpour that hit London were Soviet money, which found a perfect, safe home for its assets in the city (Garson, 2001, p. 29). Even for the US, this was a small price to pay for the enormous benefits of borrowing and selling dollars at a completely unregulated price. Thus, Eurodollars prospered.

Along with this new market, financial subsidiaries were created in the remnants of the British Empire, in places like the Cayman Islands, technically outside of British jurisdiction and guaranteeing absolute secrecy and no controls (and no taxes), yet providing a fast track to the massive money laundromat that London was becoming (Lemaire, 2023, December). Thus, the City of London we know today emerged and took shape (Palan, 2010, p. 165). The race to the regulatory bottom that allowed for this staggering concentration of wealth was just beginning.

The Big Bang to Today

Then came the 1980s. Neoliberalism, trickle-down economics, and unbridled competition were the name of the game. In the eyes of the new Thatcher government, the City was still too regulated to compete, particularly against a less and less regulated Wall Street. Thus, the Financial Services Act was passed in October 1986, which came into effect on October 27. This massive push for further deregulation carries another name: the Big Bang. There are arguably three rule changes that transformed the City the most: the end of fixed commissions for brokers, which massively increased the take-home pay of everyone involved; the end of the separation between commercial banks and investment banks, which led to a spectacular wave of mergers and acquisitions (M&As), and the opening of the London Stock Exchange to foreign companies which brought hundreds of hungry financial services companies, particularly American ones, to London (Centre for Policy Studies, 2006).

It was akin to a steroid injection, transforming the British capital into a global city, an alpha city, arguably the most important financial centre in the world, at least until the 2008 crisis (Financial Times, 2006). Even today, London is the world's biggest exporter of financial services. Nothing stops the train from rolling.

Post-Brexit, Westminster has frenzied itself up with talks of a Big Bang 2.0, more to do away with the EU's prescriptive regulations than to inject a second dose of steroids into the so-called country's Crown Jewel. The City is the goose that lays golden eggs, and the race to the regulatory bottom is not yet over. With this added context, hopefully, we may see why the Square Mile works the way it does and better understand some of its underlying dynamics—and some of the criticisms levied against it.

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01

London's Adaptation Finance Landscape

View from London City Hall to the Royal Victoria Dock Footbridge. © 2024 Valentin Salperwyck.

1.1 Climate Change Adaptation

Ginevra Figini
Eva Martineau
Fanny Pajot

In the UK, the effects of climate change are starting to become visible, especially since the 2022 heat wave and the 40°C registered in London. Other major threats for the capital city are droughts and floods, threatening food and water supplies. Climate change adaptation becomes crucial, to reduce the vulnerability to current or expected effects of climate change. Adaptation strategies should be mainstreamed —applied at all sectors and all scales—and not only coordinated at the national level. Hence, cities have a crucial role to play.

Local actors are nevertheless facing important challenges and especially in terms of means. Firstly, climate change comes with a lot of uncertainties, and information is often missing to establish the right adaptation strategy. For instance, in the case of London, how to determine what could be the flood risks in 50 years given the uncertainties associated with sea level rise and increased precipitation. Then, there are several challenges related to governance framework and coordination of the stakeholders to make informed planning and investments. Finally, for public authorities, it is particularly hard to leverage capital and overcome the finance gap—which will be addressed in a second part. In London, a first climate action plan was published in 2011, and revised in 2024; it aims to adapt the city to the main challenges of climate change. After reviewing the current state of climate adaptation at the international, regional, and local scale, we will question the framing of the current climate strategy and the potential associated issues.

Climate Adaptation: From the Global Scale to London's Perspective

According to the Sixth Assessment Report on Impacts, Adaptation and Vulnerability by the IPCC (Pörtner *et al.,* 2022), global efforts in implementing climate adaptation policies have increased over the past decades, reaching 170 countries which have now integrated adaptation in their climate strategies. However, the IPCC reports that countries are facing an adaptation gap on several fronts. First, current adaptation actions are insufficient and inappropriate to face the risks that the climate crisis will pose globally in the upcoming century. Indeed, most policies and measures are described as "fragmented, small in scale, incremental, sector-specific, designed to respond to current impacts or near-term risks, and focused more on planning rather than implementation" (Pörtner *et al*., 2022). Second, different economic and financing conditions are affecting the implementation of climate adaptation policies around the world, at the expense of lower income communities. Third, finance for mitigation policies is currently overshadowing adaptation finance, which is counting predominantly, if not almost totally, on public finance. The lack of private finance for adaptation measures is particularly detrimental for developing nations, where climate disasters are and will increasingly cause economic damage and further reduce public capacities to finance climate resilience (Pörtner *et al*., 2022).

Given the increasingly disruptive and catastrophic impacts of the climate crisis on communities around the world, the topic of climate adaptation has increasingly attracted the attention of global leaders and policymakers. The increased relevance that climate adaptation has acquired at a world-scale is easily observable through the Conferences of the Parties' (COP) narrative around this topic. Since 2010, when world leaders signed the Cancun Adaptation Framework, adaptation discussions have turned more and more into the topic of loss and damage, namely how particularly the most vulnerable countries are being affected by the most detrimental consequences of the climate crisis. During COP26 and 27 in Glasgow and Sharm el-Sheikh, new financial resources and funds for the most vulnerable nations were unlocked for these purposes, and the Glasgow-

Sharm el-Sheikh work programme on adaptation was launched (United Nations, n.d.).

European countries and the European Union (EU) have increasingly supported politically and financially the establishment of a Loss and Damage Fund for developing countries (Harvey *et al.*, 2022), and they have been particularly supportive of early climate adaptation policies. Indeed, in 2012, the European Commission and the European Environmental Agency co-launched the European climate adaptation platform (Climate-ADAPT), to help authorities and citizens understand how the European climate is evolving, what related risks are associated to these changes, and what they can do to act upon it through best practices and several tools (Climate-ADAPT, n.d.). The launch of this platform was followed one year after by the first European Adaptation Strategy, which made the EU's effort official to encourage EU Member States and local authorities to implement local adaptation policies, "climate-proof" vulnerable infrastructures and economic sectors, and enhance the dissemination of information on climate adaptation, especially through the Climate-ADAPT (European Commission, n.d.).

Following the withdrawal of the United Kingdom (UK) from the EU in 2020, the British national government did not take part in the renewed version of the EU Adaptation Strategy of 2021 (European Commission, n.d.b), and ended its alignment with EU adaptation policies and initiatives such as Climate-ADAPT. Despite this, since 2008, when the Climate Change Act was approved in the UK, England, Scotland, Wales and Northern Ireland have been redacting binding adaptation strategies every 5 years (Climate Change Committee, 2024). In England, adaptation strategies are called NAP (National Adaptation Plan), and they are mainly under the supervision of the Department for Environment, Food and Rural Affairs, contrary to mitigation issues which are instead dealt with mainly by the Department for Business, Energy, and Industrial Strategy (Timperley, 2018). According to the Climate Change Act, NAPs must be redacted based on risk assessments carried out by the national government with the help of the Committee on Climate Change (CCC), an "independent, statutory body" which gives scientific advice on climate policies to the government (Climate Change Committee, n.d.). So far, the English government has published three NAPs, in 2013, 2018, and 2023, all under the guidance of a Tory majority (conservative) in the Parliament. Over the years, the Tories have passed from neglecting climate issues from their political priorities to welcoming them to respond to the increased electorate's attention dedicated to the climate crisis (The Economist, 2024). Moreover, the Tories' enhanced attention to climate issues may have been also caused by a spike in climate politics momentum caused by COP26, which was hosted in Glasgow under Boris Johnson's government. During this latter, as above-mentioned, climate adaptation and the issue of loss and damage acquired a renewed importance, which may have inspired the English government to raise its ambition in the crafting of NAP3 (Defra, 2023). The latest plan indeed covers different aspects of adaptation policies, from specific sectorial and technical measures to community and authorities' engagement, and reporting strategies.

According to the Independent Assessment of the Third National Adaptation Programme (NAP3) by the CCC (2024), the NAP3 represents an improvement compared to previous plans as it addresses all climate risks and many proposals advanced by the CCC and pledges to create a cross-government Climate Resilience Board to tackle adaptation on all governmental levels. Such risks with the highest magnitude for England point to 11 issues, such as flooding, coastal erosion, water scarcity, and extreme temperatures

(Sustainability West Midlands, 2021). However, the CCC (2024) argues that the plan also presents important flaws, mainly that it does not address adaptation gaps sufficiently in terms of measures to realistically achieve the proposed goals. The CCC (2024) reports to what extent the UK government addressed each climate risk in the NAP3.

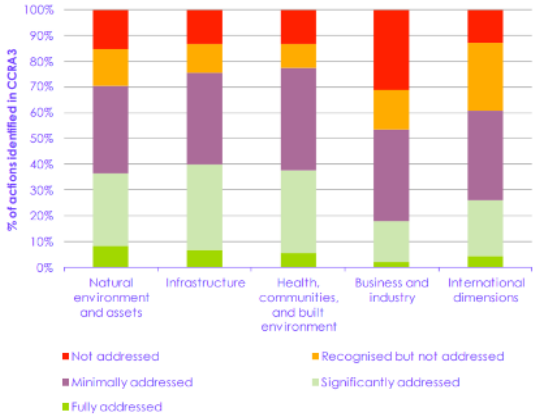

Figure 2. Evaluation by the Climate Change Committee of the Third National Adaptation Programme (NAP3) Source: Climate Change Committee, 2024, p. 9.

At a more local level, the municipality of London has also been implementing a climate adaptation strategy. The Greater London Authority published the "London Environment Strategy" in 2018 (Mayor of London, 2018), in which the overall environmental plan for Metropolitan London is presented. This strategy includes a section on climate adaptation, in which specific goals have been produced based on the main climate risks for the UK identified by the CCC in 2017. The main adaptation gaps addressed in the report are flood risks and drainage capacities, droughts and heat risks. Compared to NAP3, the authorities of Greater London have a less extended adaptation programme given the reduced territorial scope but focused on similar priorities as the national plan and tailored to more socially-just, realistic and short-term policies compared to the national ones.

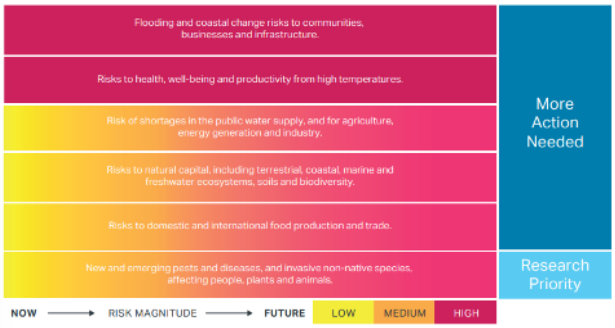

Figure 3. Top six areas of inter-related climate change risks for the United Kingdom identified by the Climate Change Committee. Source: Greater London Authority, 2018, p. 333.

Framing Adaptation Strategies at the Political Level

The question of framing is central at the political level. On the one hand, it seems that the line between adaptation and mitigation is blurry. During the meeting with the London Greater Authority, we witnessed how adaptation was often put in mitigation's shadow. Mitigation and adaptation are used together, restraining the importance of adaptation alone, implemented by public authorities. In the past environmental strategy from 2018, the Greater London Authority very much put the emphasis on cutting emission and reaching net zero and only dedicated one chapter to adaptation. Nevertheless, for the past few years the municipality has taken lessons from the extreme events affecting the 8.8 million people living within Greater London boundaries and improved the adaptation strategy. On the other hand, mitigation is conceived as a public good, benefiting all, and seems to be privileged by London's authorities over adaptation, understood as belonging to private action. The case of the Thames Estuary Plan 2100 perfectly illustrates the problematic privatisation of water management. It is now the responsibility of the municipality to engage with stakeholders and find a flexible adaptation pathway to sufficiently reduce vulnerability for the 1.4 million people exposed to floods,

representing 16% of the population, and around 100 000 residential properties in flood areas.

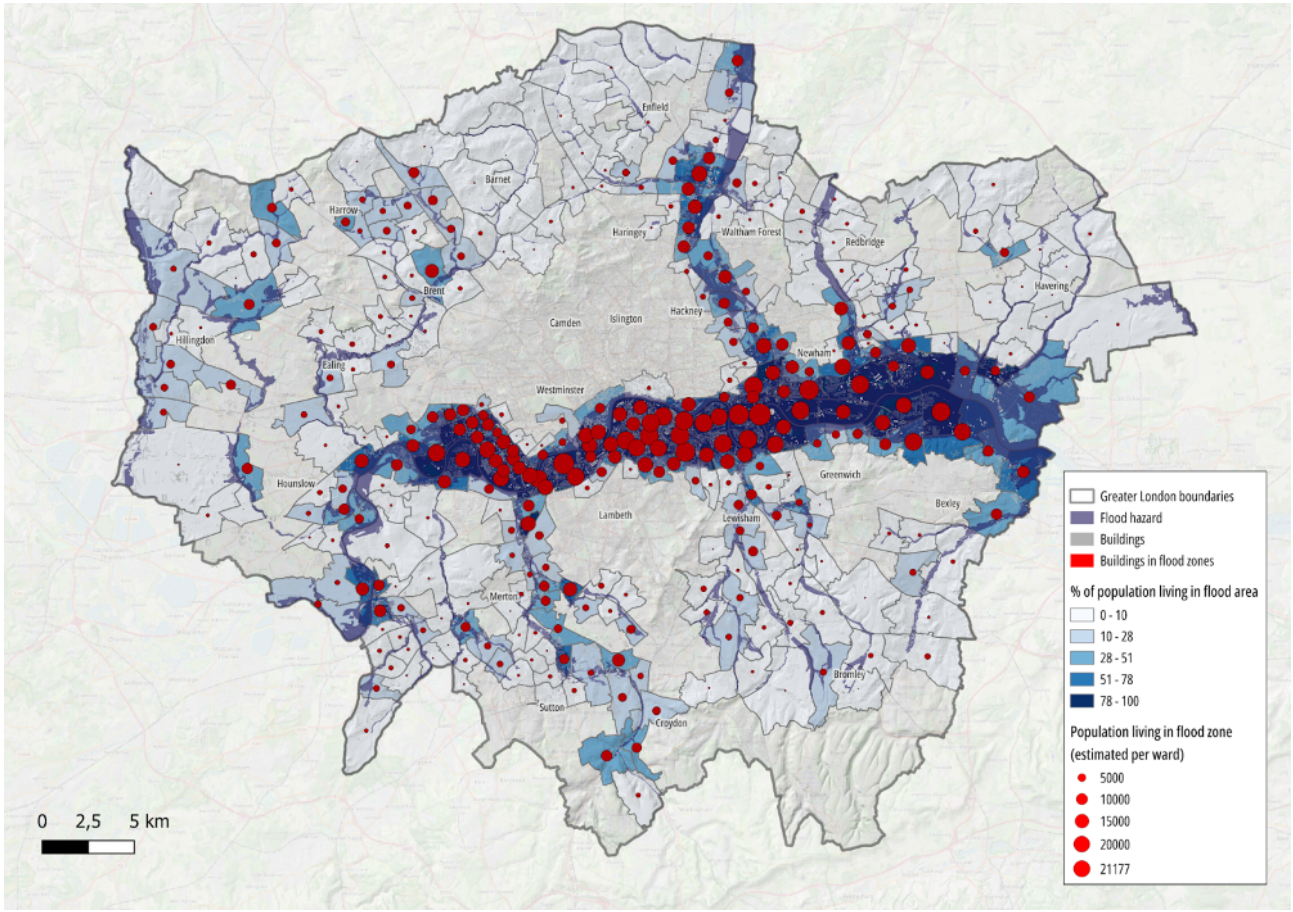

Figure 4. High scale flood risk assessment for very low probabilities of flooding in Greater London in 2023. Self-made, QGIS. Source: data.gov.uk.

Communication about climate change is part of effective adaptation and contributes to raising public awareness and can push some topics on the political stage. Generally, when a striking event occurs, public awareness increases and sometimes, if there is a problematic situation, it reaches the political agenda to be addressed. When looking closer at the British media coverage on climate change adaptation, there are two striking points.

First, there is a quantitative issue with the number of articles dedicated to climate change. The media tended to focus on striking events such as floods, heat waves, and forest fires. This is illustrated by the graph below, as the peaks of information about climate change correspond to specific events: Glasgow COP in 2016, the COVID pandemic and major forest fires in Australia in 2020, and the heatwave of 2022. By doing so, they encourage "reactive" strategies (i.e. post-crisis adaptation). Additionally, some media are embracing the topic more than others. While the Guardian created a specific rubric dedicated to climate change, others did not grasp yet the importance of informing people about it.

Second, there is a qualitative issue, with articles poorly making links with adaptation pathways. Here, it seems that there is a misunderstanding on the scale of the problem: the media make their readers believe it is their role to adapt their lifestyle to climate change—which in a sense is true—and thus frame adaptation as a private good. The emphasis is put on the benefits of individual actions. For instance, during the 2022 heatwave, the media recommended taking advantage of the

shadow, keeping the curtains closed and eventually mentioned the painting of the outside walls as a solution, but did not include much information on how public actors planned to adapt the city to the urban heat effect. Moreover, some media tend to neglect the effect of climate change: in that sense, a quick overview of the July 2022 covers highlights how the media failed to warn about the consequences of extreme climate events. Sometimes they conveyed dissonant messages, with covers depicting "fun in the sun" activities (i.e. people lying at the beach or enjoying the sun), and articles advising to be careful due to high temperatures. Even though climate change is not questioned anymore in the UK since 2018, these two points highlight a new form of climate denialism in the media. Either the media are filling up the public action gap by advising on individual adaptation pathways, or they are contributing to the ideal of private adaptation.

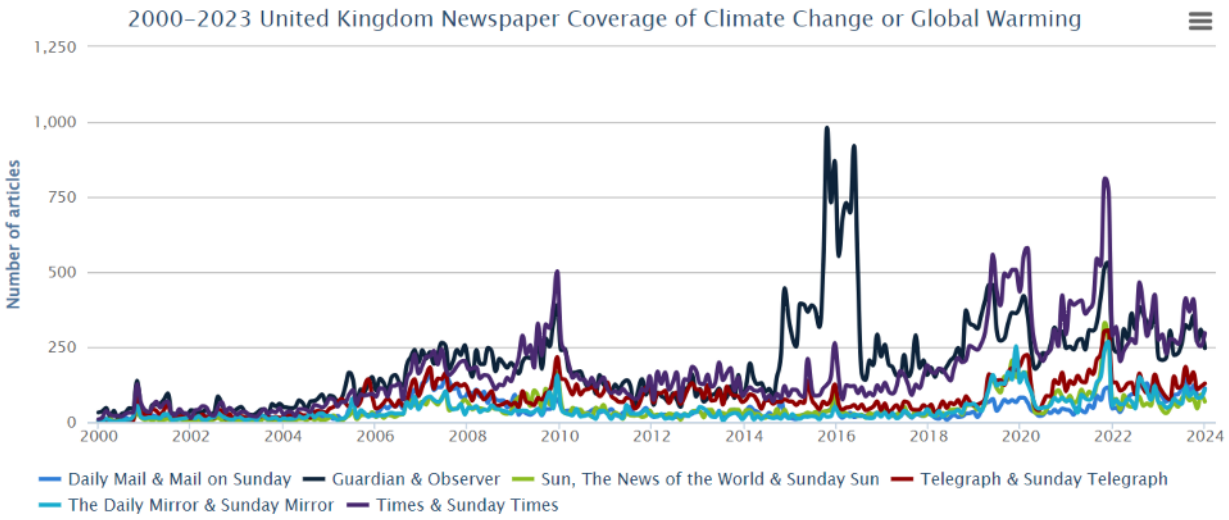

Figure 5. 2000-2023 UK Newspaper Coverage of Climate Change or Global Warming. Source: http://mecco.colorado.edu

Issues with Current Adaptation Strategies

Firstly, current adaptation strategies favour some topics more than others, leading to a lack of consideration of some issues in reports or in adaptation plans. This generates unequal means and level of adaptation between sectors and communities, which is undesirable when looking at the general pictures of adaptation, co-benefits, or conflicts in adaptation strategies. This imbalance is often in favour of pursuing buildings' adaptation, or transport issues at the expense of more "niche" or less visible topics such as food resilience or water availability. This is also the case in London, where food resiliency was not integrated in adaptation plans until the 2024 Report, as it only focused on floods, heat waves, or droughts in earlier reports.

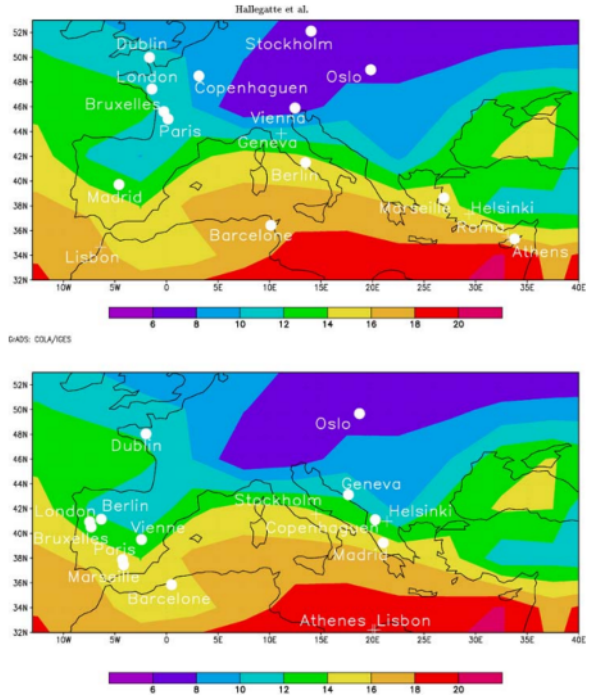

Figure 6. Two climate models trajectories. Source: Hallegatte et al., 2007.

The second major issue of current adaptation strategies is the uncertainty of climate models. Adaptation being about adjusting to future effects of climate change, the strategies taken are based on future climate models. However, these models are highly uncertain as they depend on many variables, simplifying assumptions, and human activity trajectory hypothesis. Thus, hundreds of possible scenarios exist depending on which models authorities based themselves on, London could have the climate of present-day Nantes, France, or Villa Real, Portugal, as seen in the two different climate models (Hallegatte *et al.*, 2007).

Moreover, because cities and neighbourhoods are fine-grained scales, uncertainties are even more present. Indeed, scaling down from the global climate models to regional ones, then national ones, to finally have local ones, implies that models must account for additional uncertainties at each step. Therefore, local authorities have a wide range of climate models possible and must account for that in their adaptation strategies, making it difficult to implement policies and projects that fit the real future local context. In 2022, London experienced 40°C, but up until the beginning of the same year, the Climate Change Committee assured it was very unlikely the city would reach this temperature before 2050 (GLA, 2024).

The last issue with current adaptation strategies regards the topic of maladaptation. Maladaptation is defined by adaptation that was not successful at adjusting to the effects of climate change while increasing the vulnerability of some communities or sectors (Smit, 1993; Burton, 1997). Multiple types of maladaptation exist, acting on different aspects that should be tackled by adaptation strategies (Barnett & O'Neill, 2010).

Figure 7. Maladaptation types. Self-made. Source: Barnett & O'Neill, 2010.

These maladaptations act on vulnerabilities in different ways, by enhancing already existing vulnerabilities, redistributing them, or creating new ones (Carbon Brief, 2021). However, sorting adaptation strategies in maladaptation or successful ones is not a black and white task. Indeed, there exist many grey areas, where a strategy is considered as a successful adaptation for a community but not another one, or where a strategy is successful in almost all aspects but is lacking behind for one. Thus, defining maladaptation and consequently, successful adaptation, can be quite tricky.

Avoiding maladaptation can be difficult as its definition is fuzzy. However, general guidelines help going towards successful adaptation (Hallegatte, 2009). Examples of that are "soft strategies" or "no-regret strategies." The first one is about prioritising institutional or financial tools rather than infrastructures as they are more flexible, like London's flood alerts implementation in its Strategic Flood Response Framework (Gegg, 2022). The second is about implementing strategies that have benefits even without climate change, like green roofs that have many co-benefits or cool centres, cooled public buildings with extended opening hours during heatwaves (Martin, 2023).

Whereas grey infrastructure tends to fall more easily in the trap of maladaptation because of their high opportunity cost and for being less adaptive, green ones do not have these loopholes and gather important co-benefits. However, to be efficient, high maintenance costs are needed throughout the years (Barnett and O'Neill., 2010).

In the case of London, The Thames Tideway Tunnel is a great example of a grey infrastructure. It has high opportunity costs, is less adaptable, and thus could be defined as a maladaptation. However, the strategy behind the project is reversible and flexible. The different possible adaptation paths according to different levels of water rise (the light blue line shows a possible pathway) is illustrated below.

The case of the Thames Tideway Tunnel is thus a perfect example of the thin line between adaptation and maladaptation, and how a successful adaptation in some ways can also be seen as an unsuccessful one. These grey areas in adaptation infrastructures and policies can complexify the implementation and definition of adaptation strategies.

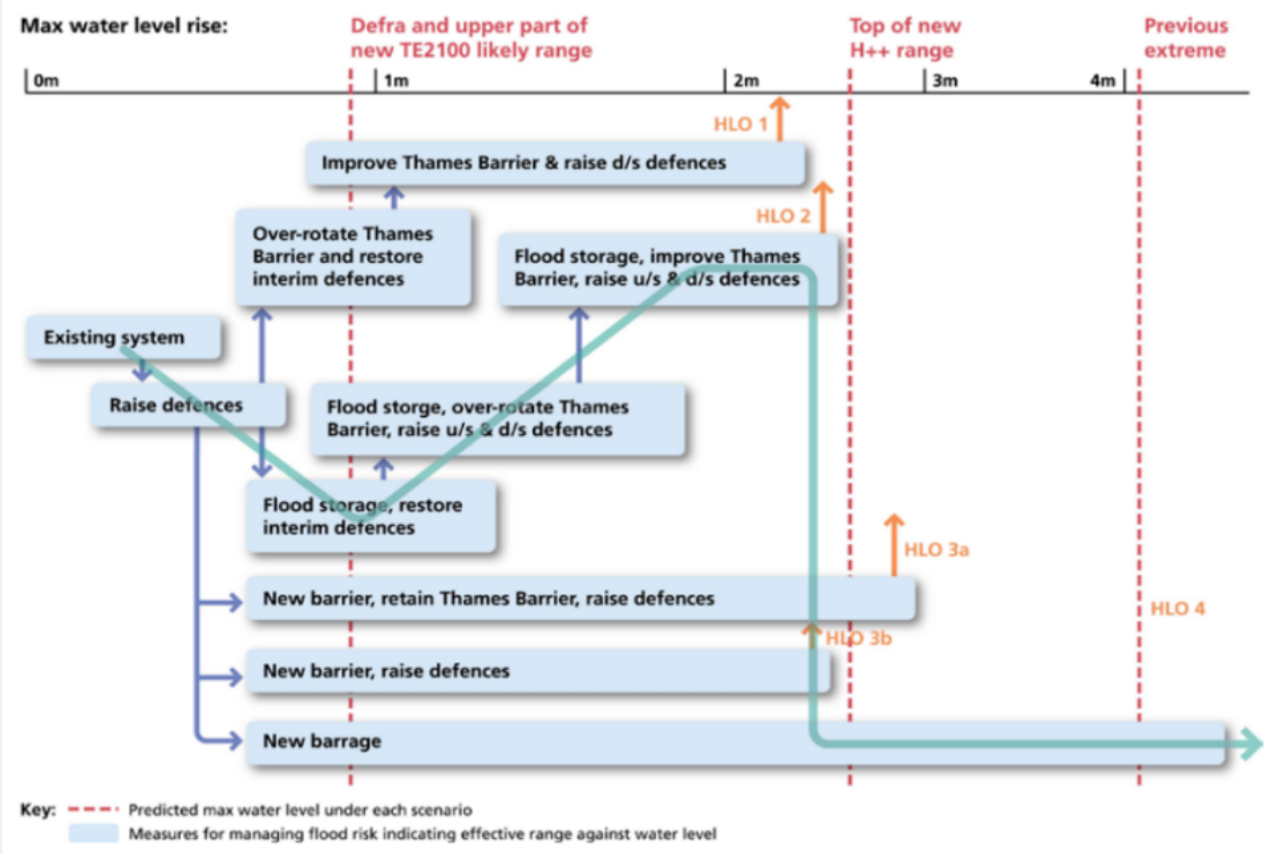

Figure 8. Possible adaptation paths for managing flood risk in London. Source: Reeder & Ranger, 2011.

Conclusion

In short, adaptation is only beginning to take its place in the climate change debate. Not fully understood yet, politics and citizens often mistake it for mitigation. However, international, national, and local authorities have started to act on adaptation: from the COP, to the European Climate-ADAPT, the UK Climate Change Act, or the London Environment Strategy, different governmental levels are initiating changes. However, authorities still have multiple challenges to face: from unstable media coverage to unequal distribution of topics in strategies, uncertainty of climate models, or the issue of maladaptation, the adaptation's landscape is a complex one that needs to be dealt with to offer the best living conditions to all the population.

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1.2 Financing Adaptation

Maria Eduarda Rezende
Max Jaeger

After analysing the challenges and complexities of climate adaptation, the discussion now turns to the issue of financing adaptation. Adapting to the challenges of climate change requires significant financial resources. While the focus has often been on mitigating the causes of climate change, adaptation finance plays a fundamental role in addressing the impacts already being felt, as well as building resilience for future consequences. Although the terms 'funding' and 'finance' may often be used interchangeably, they are not to be mistaken for one another. While funding refers to a sum of money provided for a specific purpose (often by a government entity or donation), finance refers to an amount of capital given to an entity (such as an organisation, firm, country, etc.) with the expectation and liability of return, often with the element of interest.

This section of the report will examine the complexity of financing adaptation projects, by highlighting the main challenges, as well as the existing and innovative tools to finance adaptation projects. It will be followed by an analysis of the state of adaptation financing in London today.

The Complexity of Financing Adaptation

> *"Climate finance refers to local, national or transnational financing—drawn from public, private and alternative sources of financing—that seeks to support mitigation and adaptation actions that will address climate change" (United Nations Climate Change, 2024).*

In this context, adaptation finance refers to financial support, acquired from various sources, aimed at facilitating actions to address the impacts of climate change. Unlike mitigation financing, which focuses on reducing greenhouse gas emissions, adaptation finance deals with building resilience and adapting to changing climatic conditions.

Challenges to Financing Adaptation

One of the main challenges to financing adaptation lies with pricing climate risk. Understanding how climate risk affects business' profitability is crucial for attracting private finance into adaptation. It involves assessing the impacts of climate events on revenue, interruptions, and operations. For example, coastal developers might underestimate future damages without understanding rising sea levels and increased storms. Yet, localised impacts and data gaps complicate risk evaluations (OECD, 2023). It is also challenging to quantify the cost of "doing nothing" and assess adaptation effectiveness before a crisis. Beyond the difficulty of measuring risk, it is also difficult to measure the societal and external benefits of climate adaptation, as they often do not translate into financial return. Frequently, these benefits are unquantified, leading to an incomplete picture of investment value when focusing solely on financial gains.

In addition to the difficulty of translating societal value into financial value and the complexity of predicting risk, a lack of policies and regulations make it harder to internalise and value adaptation benefits. According to the OECD (2023), a supportive policy framework, including regulations and incentives specific to adaptation, can encourage investors to integrate climate risks into their decisions. However, the situation is far more complex in under-developed and developing countries, which may lack the political frameworks for such measures and incentives, which, in turn, decreases sector-specific investment in adaptation particularly where it is needed the most (OECD, 2023). The financing gap in developing countries is estimated to be 5 to 10 times greater than the current international adaptation finance flows (UNEP, 2022).

There are also technical and knowledge-based challenges to adaptation finance. The OECD (2023) identified three main gaps in technical

knowledge: (1) the gap in monitoring and information technology, which is exemplified by the limited information on crucial data, such as poverty rates, ecosystem services, and the capacity for adaptation and identification of targeted communities; (2) The difficulty to demonstrate the "adaptation" focus of projects —adaptation funding may require the delimitation of the costs related to adaptation, which can be difficult to narrow down in a larger infrastructure project; and (3) The lack of expertise to develop the adequate proposals and pipelines for funding applications.

Lastly, mitigation and adaptation objectives can often be addressed in the same project, as they are able to build resilience and reduce emissions simultaneously. However, there is a significant gap in financing mechanisms that simultaneously tackle both. Climate finance predominantly focuses on addressing mitigation and adaptation separately. Only a small fraction, accounting for 2.4 percent of the total known climate-related finance in 2019 —2020 (UNEP, 2022), was allocated to projects that cut across both mitigation and adaptation. Similarly, OECD (2022a—retrieved from UNEP, 2022) reports that only 9 percent of mobilised climate finance during the 2016—2020 period was cross-cutting.

Tools for Adaptation Finance

The inherent value of adaptation projects does not exactly translate into financial terms. What does that mean for adaptation finance? It means that the traditional financing instruments, such as concession loans and grants, may not be sufficient to meet the adaptation financing gap. Multiple innovative and climate-specific instruments have been developed and continue to do so to attract private investors. Climate ADAPT (2023), has categorised these instruments into "mature, emerging, and pilot" instruments. Mature instruments refer to the established mechanisms that have been adapted to climate adaptation finance. For example, Catastrophe Bonds (CAT bond) (Henry, 2021), originally designed for insurance companies, provide funding only if predefined catastrophic events occur, mitigating the impacts of natural disasters while offering investors interest payments and principal repayments if the event does not occur. Other notable and long-established mature instruments include Green Bonds, Debt-For-Nature Swaps, and Public-Private Partnerships (PPPs). Emerging instruments are new financial mechanisms that may (or not) have been developed for climate adaptation. An example of such is a Sustainability-Linked Loan (SLL) (Godemer, 2023), a financial tool that encourages adaptation finance by tying loan terms to specific environmental, social, and governance (ESG) performance goals, promoting investments in climate-resilient sectors and projects while offering flexible financing options for borrowers. Lastly, a pilot instrument consists of instruments still under development. An example of a pilot instrument is the Adaptation Benefits Mechanism (African Development Bank, n.d.), which is piloted by the African Development bank, and certifies the benefits of specific adaptation activities to project developers or governments, who then transfer these certificates to donors based on off-take agreements, improving project viability by using these certificates as collateral for upfront loans or equity investments, therefore attracting private sector investment for adaptation projects in developing countries across many sectors, such as disaster risk reduction and energy infrastructure.

It is important to bear in mind that "finance is a means rather than an end" (UNEP, 2022) and that beyond allocating funds and gathering investors into climate adaptation projects, the challenges of adaptation also extend to the proper planning and implementation of targets and that financial instruments do not guarantee

the efficiency and effectiveness of adaptation measures.

How Finance Operates in London

The Power of Finance in the UK

The best way to understand adaptation finance in London is by talking about a very active, and historically significant, institution: The City of London Corporation. Created in 1066 by William the Conqueror as he entered London, the Corporation aimed at safeguarding the rights and privileges of the merchants in the mediaeval city. Ever since it kept its role, as rulers needing financial support from wealthy Londoners were keen on keeping and extending this favourable exception in exchange for capital. Today, the institution serves a tricky double role: local government for the borough and lobby for the financial market. Chris Hayward, Policy Chairman of the Corporation, explained that "we are in charge of the government of Square Mile, but also to defend the interests of the City to the governments and to represent and promote the entire UK financial sector" (Lemaire, 2023).

The specificity of the Corporation does not stop there, the way its democratic systems work is also to be discussed. The candidate status is obtained through co-optation as multiple members need to agree on new profiles and companies that are present in Square Mile have a right to vote proportional to their workforce thus making the actual 9,000 residents a minority over the 20,000 voters registered for the election last March 2022. If this is important to mention it is because the Corporation is powerful. On top of the usual public competencies, the Corporation benefits from multiple exemptions such as the right to fix its own tax rates on companies and the right to manage its own police force, independent from the metropolitan one. The City of London Corporation also manages the urban planning of Square Mile, which it gave responsibility to Peter Rees, the chief urban planner of the City from 1985 to 2014. Through his 27 years in office, Rees massively transformed the area encouraging the building of international style skyscrapers. Ken Shuttleworth, a famous British architect, does not fear comparisons when talking about his impact on Square Mile: "There are no forces that have had more impact on the London skyline than the Luftwaffe and Peter Rees" (Peter Rees: The Man Who Reshaped the Square Mile," 2014).

Having mentioned the more Regalian powers of the Corporation, it is important to state the obvious: The City of London is immensely rich. In 2021, its assets were estimated at around £3.4 billion, making it by far the wealthiest municipality in the UK. This wealth is mostly driven by its £2 billion real estate assets mostly in the Greater London area but also by the £932 million managed through investments funds (City of London, 2021).

Finally, the City of London Corporation has an important political role in the UK and abroad. The Remembrancer, an official lobbyist, has been allowed since 1685 to represent the interest of the City in the House of Commons. In fact, the Remembrancer does not work alone, he has a team of lawyers at his disposal working full time on analysing law projects and trying to get decision makers to vote in favour of finance interests. In 2021, their activity was budgeted at £13,7 million, more than the most important financial lobby in the EU: The Association for Financial Market in Europe (AFME). In the 2010's, under the supervision of labour minister of finance and mayor of London, Boris Johnson, this lobbying role of the City of London Corporation was given an official entity: TheCityUK. Described as "the UN of UK finance" by its Head of Public Relation, Jack Neill-Hall, the organisation holds representatives from every major group present in Square Mile: the Americans JP Morgan, Goldman Sachs, and BlackRock; the British HSBC, Barclays, Citigroup and Lloyd's; and the French Société Générale, BNP Paribas,

Crédit Agricole and Axa or even Deutsche Bank and the Japanese Nomura. Not counting the consultants Ernst and Young, KPMG, PwC and representatives of the City Corporation (Lemaire, 2023) (Leadership Council, TheCityUK, n.d.). If TheCityUK was particularly active at the European level pre-Brexit, the last British European commissioner even used to be part of the organisation, it has since thrived as an advocate for lesser regulation in the UK.

In the words of Neill-Hall,"The EU is like a super tanker, huge and difficult to manoeuvre while the United Kingdom is now a ship certainly smaller in size but more easily manoeuvrable." He adds that "in a world where business and winds change at a crazy pace, we have the possibility of going faster."

A call for lesser regulations that, we will see, seems to have earned quite some support in the British political spheres of the country recently.

Finance in the UK Today

At this point it would seem legitimate to question the importance of the financial sector in the UK and try to understand its benefits for adaptation.

For Neill-Hall, the answer is obvious: "The sector represents 12% of the UK's GDP, it employs 2.3 million people across the country, and it exports more than all other industries combined." Those numbers seem slightly overestimated when compared to those of the report commissioned by the House of Commons on the contribution of financial services to the UK economy, but they do express the importance of the sector for the country (House of Commons & Hutton, 2022). Based on this report: "In 2021, the financial services sector contributed £173.6 billion to the UK economy, 8.3% of total economic output. The sector was largest in London, where around half of the sector's output was generated. "These figures placed the country fourth in the OECD rating for countries with the highest share of financial services input to GDP, the sector also counting 1.08 million jobs in Q1 2022, 3.0% of all jobs. Finally, taxes on the financial services industry raised £28.8 billion in 2020/21, 4.1% of all taxes collected that year according to data from HMRC (2023).

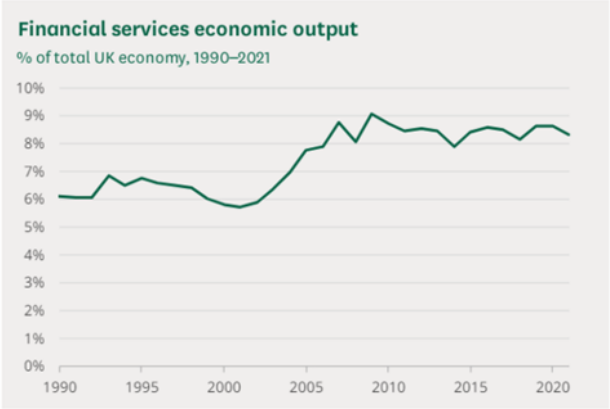


Figure 9. Financial services economic output. Source: House of Commons.

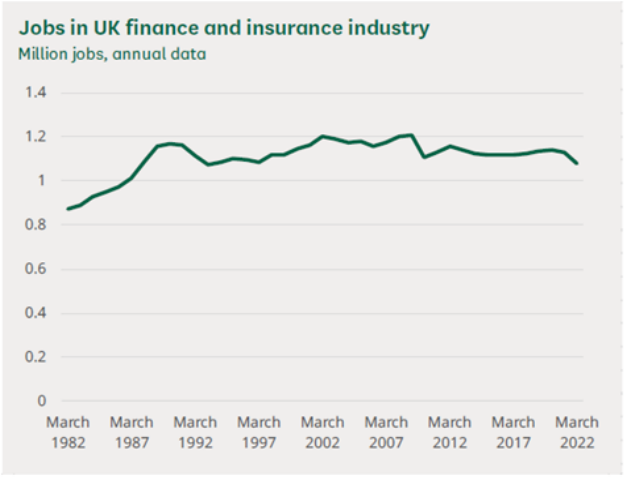


Figure 10. Jobs in UK finance and insurance industry. Source: House of Commons.

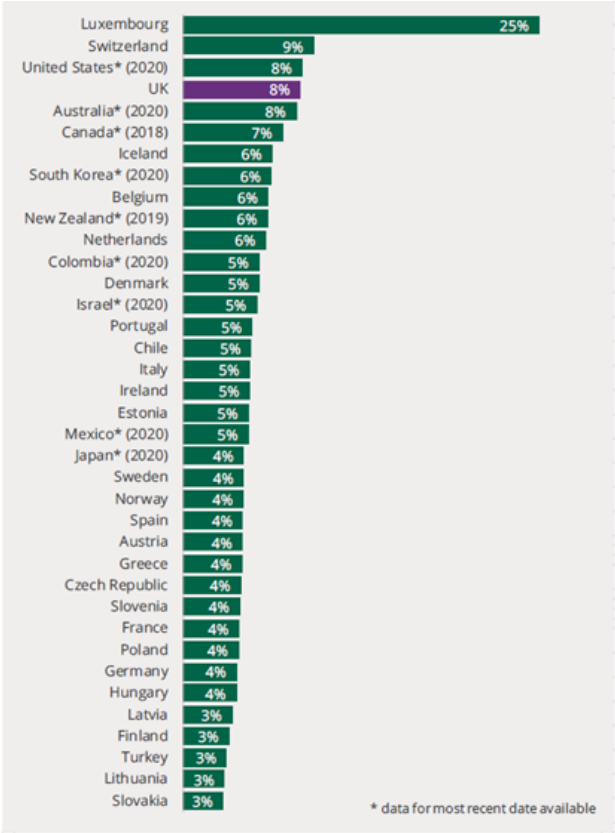


Figure 11. Financial services as a % of total economy, OECD countries, 2021. Source: House of Commons.

Figure 12. Jobs in financial services by UK country & region, Thousands, Q1 2022. Source: House of Commons.

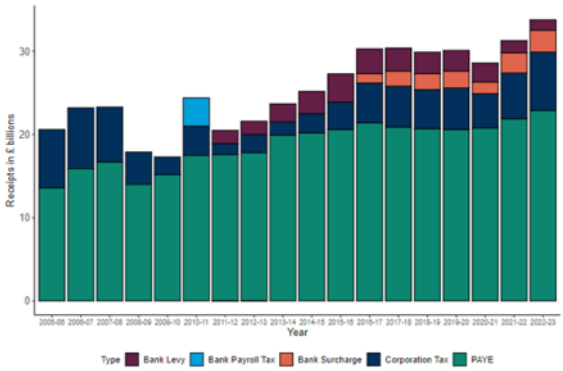


Figure 13. Tax receipts from the banking sector between 2005 and 2023 Source: gov.uk.

This data allows us, through simple calculation, to assess what Neill-Hall was insinuating. The one thing that makes the UK attractive for the financial sector is its low tax rate. Financial services represented in 2021, 8.3 % of GDP (£173.6 billion) while only accounting for 4.1 % (£28.8 billion) of taxes collected, this accounts for an average tax rate of 16.6 % (as a comparison corporate tax rate alone in France is 30%).

This leniency regarding taxation is not the only factor of attractivity for the rich in London; in fact, the whole legal framework is designed to favour secrecy upon capital. It is what sociologist Rowland Atkinson describes in his book *Alpha City*: "In Westminster, one in ten homes is held in a tax haven [...] If they wish, rich people can even buy their British citizenship" (IAS, n.d.).

As we can imagine, this situation held for the sake of competitiveness is not only attracting clean money: According to the National Organised Crime Agency, nearly £100 billion of dirty money is laundered each year in the UK (HM Government, 2023).

If things were thought to change with the repeated leaks and the most recent Ukraine war, the reality is that the interests of the rich are aligned with those of a lot of people in the British capital city: people working in financial and legal services, real estate, luxury but also some of the politicians who are likely to be tax

evaders themselves (Lemaire, 2023; Crerar, 2023). As always, there are winners and losers. In this case, it is not hard to imagine who the losers are. The cost of living in London has been skyrocketing for many years now, making the city fourth most expensive in the world during the summer of 2022 (Millson, 2022).

One of the most concerning elements in this rise in prices is housing with an unbelievable +10% on the single year 2022. In the same period, rents have increased by 20% (Millson, 2022). Victor Hugo wrote in The Man Who Laughs, "it is from the hell of the poor that the paradise of the rich is made" (1869). This reality seems to describe the situation in London today accurately, where ordinary people struggle to live decent lives in the face of the cost of living and the absence of social policies (Welsh, 2023). This reality is best described by economist John Christensen and journalist Nicholas Shaxson as "the curse of finance," inspired by "the curse of resources," the phenomenon affecting developing countries exporting precious resources, paradoxically leading to their impoverishment. For the two researchers, the UK economy is experiencing a similar situation through its dependence upon the financial sector. The capture of the political and regulating class, the low levels of investments in productive industries and research, and the concentration of wealth in London are all serious issues created by the City's activity. The overvaluation of the pound as a result of foreign investments, which increases the cost of living, is also added to this list.

Through a historical perspective and according to Christensen and Shaxson, it seems that the UK is now experiencing a similar situation in which it was putting its former colonies: being the victim of a capitalism based on rent extraction.

For Mareike Beck, City specialist at King's College London, this dependency is not only to be witnessed at the State levels. She describes a system in which individuals, facing the country's social security disinvestment over the last decades, must rely on market-based solutions for their retirement plans, health issues etc… thus becoming dependent, against their will, on the financial sector.

What is the political sphere saying about this matter? The only political figure openly critical to this reality, Jeremy Corbyn, who was the leader of the labour party from 2015 to 2020, has been sidelined since. His successor Keir Stramer is promoting a more consensual discourse. Invited to TheCityUK 2022 annual conference, Labour MP Rachel Reeves, in charge of the economy and finances in the leadership of the Party, declared that "the United Kingdom should be incredibly proud of the international success of its financial services industry, which is the first world exporter" thus embracing the position from the City's lobbyist. On the conservative government's side, the time is not for debate but for action. On July 20, 2022, a new law on financial services was presented by Rishi Sunak, former ministry of finance and current Prime Minister, aimed at achieving a "Big Bang 2.0," a reference to the Thatcher era mentioned in the introduction. Claiming they are in favour of the status quo thus seems a safe thing to say. Sunak was himself advocating for "a reduction of regulatory burden in the financial sector" (Stewart & Mason, 2022). One of the aims of the law being the requirement for regulators to promote the "international competitiveness" of financial services.

However, there seems to be a cloud on the horizon. The model of the City is rather fragile and dependent on cheap capital coming from all over the world—exactly what has been threatened by the recent crisis such as the Ukraine war and the following energy crisis. The general inflation and the monetary tightening from the FED have also pushed capitals toward the dollar economy thus highly penalising the

pound (Abdulla & Bruce, 2024). This context is prone to expose the weaknesses of the UK economy: a low diversity profile and a global overestimation of assets. While real estate values have just started to decrease after two decades on the rise, the social context described before is fostering important strikes and protests over the country (Moss, 2024). In fact, the urge of the Boris Johnson government to deregulate even more the financial sector was closely followed by the same effort from the Liz Truss government during its very short six-week mandate (from September 6, 2022 to October 25, 2022). On September 23, 2022, her ministry of finance announced a £45 billion tax cut in favour of the wealthiest. A call that did not receive the enthusiasm expected from the market. A recession of the pound followed, thus requiring an important intervention from the Bank of England to decrease the debt rate of the country (King & Thomas, 2023). This should only increase our level of scepticism regarding these policies as well as the one that will continue to come from Rishi Sunak making us question which interest they are trying to safeguard.

In fact, those policies trying to achieve growth through deregulating the financial sector, lowering taxation levels and thus public budgets not only testifies for a lack of state capacity in the UK but for its abandonment (Pabst, 2023). Looking at this issue through a climate lens, this phenomenon is problematic, as climate initiatives coming from the private sector need to make profit and thus are likely to lack social justice components. This observation is even more concerning when it comes to climate adaptation. Private financing of adaptation projects which require profitable schemes, can lead to the safeguarding of the wealthier and of their expensive assets at the expense of the most vulnerable (Mooney & Plimmer, 2024; Collier, 2023).

What Space Exists for Climate Finance?

Going back to our main topic about financing adaptation, we should discuss what falls under the umbrella of "climate finance" and what it represents in London. Considering the importance of the financial sector in the British capital city, there is a high concentration of actors working in climate finance, such as the ones we met: C40, BWB, CPI, but also the Green Finance Institute (GFI), and others. In fact, the UK was the first big economy to set a legally binding net zero target in 2019, since then a lot of efforts have been made to attract green investments in the country. Chris Starck, former head of the Climate Change Committee, the country's climate watchdog said in May 2024:

> *"Instruments like the contracts for difference (CfD) scheme make the UK an attractive place to invest in green industries, with companies having announced plans for £24 billion in low carbon investment since September alone" (Mooney & Pickard, 2024).*

In total, the government said the UK had attracted £300 billion in public and private low-carbon investment since 2010 (Mooney & Pickard, 2024). Most recently however, Prime Minister Sunak has been criticised for his rollback on net zero targets. In September 2023, he scrapped a pledge to force landlords to upgrade energy efficiency in their homes and delayed the banning of sales of new petrol and diesel cars (Horton, 2023). According to Chris Starck, it is the combination of those signals sent to the market as well as not being able to respond to the US Inflation Reduction Act, President Joe Biden's landmark legislation to boost decarbonisation, that explain the UK's recent struggle to attract green investors. As a matter of fact, the government failed to attract any bids from offshore wind developers for its most recent round of contract auctions for new projects, indicating waning appetite among investors. For these reasons, Starck said

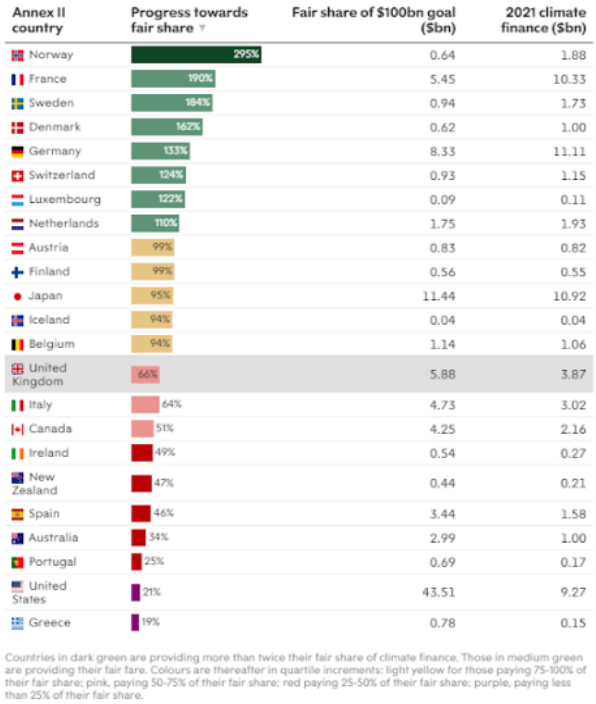
he was not confident the country would meet its 2030 target to reduce emissions by 68 per cent.

Most recently in London, the Mayor Sadiq Khan launched the London Climate Finance Facility, following the conclusion of a report commissioned to the GFI, which goal is to attract private investments necessary to achieve the city's net zero target through de-risking schemes (Mayor of London, 2023). On the side of adaptation, The Tideway Tunnel project, seems to have proven some of the limits of these Public-Private-Partnership strategies for their potential to generate excessive costs and putting them on the collective's shoulders (in this case Thames Water consumers) (Plimmer, 2024).

Finally, climate finance also implies the investment of adaptation and mitigation projects abroad, specifically in the global south from solidarity but also as part of the historical responsibility for climate change (Evans, 2021). On this matter, in 2009, a deal was made among richer nations to pledge $100 billion in annual climate funding for developing countries until 2020. Later extended to 2025, the target has been missed every year to date (Bindman, 2023).

More concerning, the sum consists mostly of loans rather than grants, leading to "major debates", given that loans can increase the indebtedness of developing countries "at a time when fiscal space is already seriously squeezed" (Bindman, 2023).

How is the UK performing regarding this issue? As Rishi Sunak declared being: "committed as ever to helping developing countries," a report from London based think tank ODI finds that Britain, alongside Australia, Spain, and Canada, stands out for its "relatively poor performance" when it comes to providing a "fair share" of climate finance (ODI *et al.*, 2023). This includes bilateral climate finance, multilateral development banks and other funds, thus testifying of a rather low participation in climate finance.



Annex II country	Progress towards fair share	Fair share of $100bn goal ($bn)	2021 climate finance ($bn)
Norway	295%	0.64	1.88
France	190%	5.45	10.33
Sweden	184%	0.94	1.73
Denmark	162%	0.62	1.00
Germany	133%	8.33	11.11
Switzerland	124%	0.93	1.15
Luxembourg	122%	0.09	0.11
Netherlands	110%	1.75	1.93
Austria	99%	0.83	0.82
Finland	99%	0.56	0.55
Japan	95%	11.44	10.92
Iceland	94%	0.04	0.04
Belgium	94%	1.14	1.06
United Kingdom	66%	5.88	3.87
Italy	64%	4.73	3.02
Canada	51%	4.25	2.16
Ireland	49%	0.54	0.27
New Zealand	47%	0.44	0.21
Spain	46%	3.44	1.58
Australia	34%	2.99	1.00
Portugal	25%	0.69	0.17
United States	21%	43.51	9.27
Greece	19%	0.78	0.15

Countries in dark green are providing more than twice their fair share of climate finance. Those in medium green are providing their fair fare. Colours are thereafter in quartile increments: light yellow for those paying 75-100% of their fair share; pink, paying 50-75% of their fair share; red paying 25-50% of their fair share; purple, paying less than 25% of their fair share.

Figure 14. The UK is not providing its fair share of climate finance. Source: Pettinotti et al., The New Statesman/ ODI (2023).

In conclusion, if we could not find any official figure on the share of climate finance capital going through London or on the number of jobs it represents in the City, it seems quite clear that it is an important place for this activity. We find two main reasons to explain this: First, the size of the financial sector and its underlying drivers discussed, second, the lack of capacity from the State, creating a constant need for private investment to achieve climate goals.

Regarding adaptation, this context makes London an interesting place to study how private capital organises to answer climate risks. Infrastructure such as the Thames Barrier and the Thames Tideway Tunnel are examples of this process. Their governance, strategies and financing schemes should be carefully and critically analysed as some signals already seem to question their ability to provide a just answer to those very concrete threats.

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02

Field Trips

London City Hall.
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2.1 PUBLIC SECTOR

2.1.a London City Government

Juliette Knighton

From heatwaves to flash flooding, London is already suffering from the impacts of climate change. Strong action is required to prevent these events from causing greater damage. The London city government acts through both mitigation and adaptation measures. The latter is estimated to be particularly costly. Meanwhile, the United Kingdom has gone down an austerity path leading to privatisation and public funding cuts. How can adaptation to climate challenges be properly addressed in such a context? To explore this, we visited London City Hall, the mayor of London's headquarters with the following questions in mind. How is climate adaptation being tackled and financed by the public sector? What solutions are put forward and what are the challenges? How is the public sector filling the adaptation investment gap? Our visit sheds light on the multiple co-benefits of green infrastructure as an adaptive solution, on the different financing possibilities, as well as on the implementation difficulties linked to governance.

We had two consecutive meetings with public officials that day. The first meeting was with Andrew Hinchley, Principal Programme and Policy Officer at the Greater London Authority (GLA). New to the GLA, Officer Hinchley used to work at the Camden borough level as Head of Green Space. He delivered an insightful presentation on green infrastructure and climate adaptation. The second meeting was with two London Assembly (LA) officials: Richard Clark, a Senior Policy Advisor who gave a general presentation, and Leonie Cooper AM, Labour Party Chair of the Environmental Committee, representing Merton and Wandsworth. The discussions conducted in both meetings allow us to claim that green infrastructure (GI) is a key adaptation investment with many co-benefits, but that private funds are required to complement insufficient public funding. To develop this, a first section expands on the importance of GI. A second part delves into the specifics of governance and funding, and a final section details the difficulties tied to GI.

Figure 15. Presentation by Andrew Hinchley at the GLA. © 2024 Valentin Salperwyck.

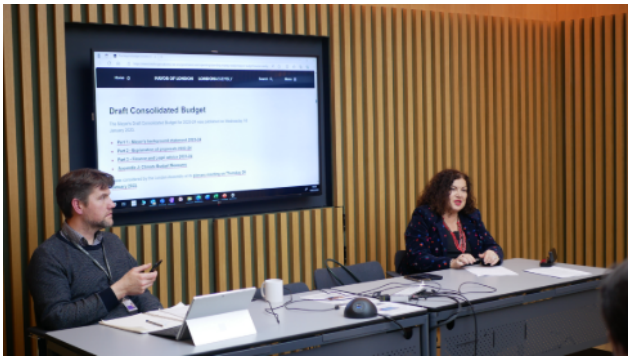

Figure 16. Presentation by Richard Clark and Leonie Cooper at the GLA. © 2024 Valentin Salperwyck.

Green Infrastructure as an Adaptation Solution

Recognising the Need to Adapt

For decades, London has been affected by regular extreme weather events including flash floods, heatwaves, and droughts. Nature has recently been placed at the core of the urgent need to adapt to the changing climate. The 2024 London Climate Resilience Review insists

that "nature-based solutions must always be considered and prioritised." Hinchley emphasised that this constitutes a major shift, since nature-based solutions (NBS) were not considered a priority a decade ago.

Multiple Benefits of Green Infrastructure

Green infrastructure (GI), which comprises NBS, is both an adaptation and mitigation measure. In the case of trees, they not only capture CO2, but also decrease the amount of rainfall that reaches the ground, which reduces flooding. Multiple benefits are associated with GI (Rogers *et al*, 2015). It is seen as a solution to several climate risks, including heatwaves. Given that trees naturally create cold and shelter, the GLA has put together a cool space map which helps individuals to identify the closest green spaces. Trees also remove air pollution. GI also reduces flooding for example, Sustainable Drainage Systems (SuDS) and rain gardens can absorb large quantities of water, thereby reducing the likelihood or severity of floods. Building such NBS on or near roads is a financially viable measure since this space represents readily available land. On the contrary, buying land to create a park would not be feasible due to its high price. This is precisely why road-based solutions are often preferred. GI represents an undeniably profitable investment (GLA, 2018b). Indeed, according to a 2017 report for the GLA, for each £1 spent by local authorities and their partners on public green space, Londoners enjoy at least £27 in value. Moreover, Londoners avoid £950 million per year in health costs thanks to public green space (National Trust and Heritage Lottery Fund, 2017). Nevertheless, this knowledge is not widely spread enough and too little is being invested in GI. It is thus key to emphasise just how profitable GI investments are to attract more investment. The private sector's Corporate Social Responsibility is a good argument to do this.

Green Infrastructure Targets

The current Labour mayor, Sadiq Khan, is working toward a net zero city by 2030 (GLA, 2018a). Although the public sector officials we met are sceptical about the feasibility of achieving this goal, GI can contribute greatly towards its achievement since plants absorb GHG emissions. Increasing GI is thus pivotal to reach the mayor's target. The London Environment Strategy contains the goal of increasing green cover to 50%, up from the current 48%, as well as a 10% increase in tree canopy cover. (Howard Boyd, 2024). The mayor also declared London a National Park City. Although devoid of any legal status, this labelling is a useful tool to communicate the importance of parks and green spaces in cities and show how they connect and create a network (GLA, 2012).

Governance and Financing

City Governance

GLA staff serve the mayor of London and the LA. The latter is the entity which scrutinises and holds the mayor to account. The mayor must consult the LA before producing the GLA budget. Parks and green spaces in London are largely owned and managed by local borough councils, which is where the core of governance power is located. This can explain our impression that the city hall building was quite small. GI is not a GLA competency. The GLA is thus not on the ground in terms of implementation. Boroughs must however respect the GLA's London Plan 2021, which stipulates that development proposals must include adequate GI linked to the city's wider green network (GLA, 2021, p. 113). Road-based GI, like SuDS, is delivered by boroughs since they have the competency over roads. While it does not manage green space directly, the GLA acts through policy, provides support, guidance, training, innovation, and project funding, including grants.

Budgetary Constraints

Leonie Cooper stated that European Union funding has not been replaced post-Brexit, and that the United Kingdom's current conservative national government is not investing in the environment (The London Sustainable Development Commission & UK100, 2020). London's local boroughs are financially deprived. While £4 million was removed from their budget in the last 10 years, they are pressured to provide greener environments. The net-zero city by 2030 target alone would require £75 billion. This does not consider the significant cost of climate adaptation. It appears clear that the public sector cannot deliver what is required alone. Attracting private finance is thus crucial.

Financing Solutions

Most GLA funding comes from the mayor's budget. Since 2016, the mayor has made more than £30 million available for green space and tree planting projects. The GLA notably offers funding to boroughs to address the vulnerability of GI to climate change. The Green and Resilient Spaces Fund is used to adapt green spaces and maximise their benefits. The London Climate Finance Facility (LCFF) was launched by the mayor in June 2023 to expand low-carbon activities. It aims to unlock billions of pounds of long-term, flexible, private finance to support the decarbonisation of London's buildings, energy, and transport systems, thereby tackling the triple dangers of toxic air pollution, climate change, and congestion. The next steps for the GLA are to explore and determine routes to expand the LCFF by drawing in greater private finance. Another innovative tool to increase local authorities' resources is habitat banking. This form of green finance provides a way for landowners—in this case, local authorities—to create or restore a habitat in advance and "bank" the resulting biodiversity units. These units can then be purchased by developers seeking to comply with the mandatory 10% biodiversity net gain. The sale of biodiversity provides a critical revenue stream for local authorities to maintain the newly restored or created habitat for a minimum of 30 years (Defra, 2023). This is referred to as an endowment.

Challenges and Shortcomings

Green Infrastructure Implementation Difficulties

The GLA is aware of the challenges linked to GI. One of these is watering pressure due to reduced water availability linked to extreme heat and drought. An additional issue is the question of where to put GI. This is related to the underlying political and economic tension tied to the use of space in London. Moreover, the 10% canopy increase target is not simple to achieve because it is not possible to simply fill up parks with trees, since that would prevent other recreational uses, namely sports. Pertaining to street trees, a further obstacle lies in the fact that many utilities are situated underground, preventing planting in many areas. Furthermore, increasing green space is not a given. Indeed, officer Hinchley revealed that during planning discussions, the view that there is already enough green space is sometimes expressed.

Gentrification

While officer Hinchley acknowledges the social injustice of climate change impacts, he didn't see green gentrification as a prevalent issue in most projects. What's more, when asked about GI-induced gentrification, Chair Cooper did not comment. This was very surprising given the fact that the London Climate Resilience Review mentions a "people-centred approach, locally led, working to reduce vulnerability and to address socio-economic and racial inequality." The London Environment Strategy similarly emphasises the goal of a city "where *all* can enjoy high-quality green spaces, clean air, clean waterways" or one with "tree filled green

space for *everyone* to enjoy." To realise these aims, addressing gentrification concerns is key.

The officials' detachment with the issue contrasts with the fact that officer Hinchley stressed the importance of community engagement. From not littering, to more proactive tree-watering or looking after community gardens, he mentioned that participation and green spaces' long-term sustainability is only possible when the population is involved in the earlier processes of a project.

QUESTIONS RAISED

- *Is the GLA considering tax reform to address the funding gap to implement its green infrastructure targets?*
- *Does London's public sector separate funding for mitigation and adaptation to climate change?*
- *What are the challenges of green gentrification in London?*

Conclusion

Our trip to London City Hall helped us dive deeper into the opportunities and challenges surrounding GI, a key measure to tackle climate mitigation and adaptation in the city. GI is a profitable investment, desirable for the multiple co-benefits it produces and greatly needed to help London meet its targets. However, the underfunded public sector cannot afford the required investments in GI. The problem of underfunding was also key in the message delivered by the actors met at Wetlands TE2100 later during our trip. Faced with austerity, we asked whether the GLA was considering tax reform but didn't get a reply. However, one thing that was clear was the need to draw in more private funds. The presentations delivered also made us curious to know whether London's public sector separates funding going to mitigation or to adaptation. Finally, we asked the officials about green gentrification, and they did not perceive it to be a major concern. We were left quite sceptical with the desire to investigate the issue further.

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2.1 PUBLIC SECTOR

2.1.b Walthamstow Wetlands and the Thames Estuary 2100 Plan

Nicola Candoni
Salomé Lenz

The presentation by Mikaela D'Souza and Nicola Penny, representatives of the Environment Agency (EA) about the Thames Estuary 2100 Plan was hosted in the Engine House at Walthamstow Wetlands, in the outskirts of London. The area is well known as one of the ten main Thames Water reservoirs which supply 3.5 million people. It is also a Nature Reserve open to the public which connects back to our discussions at the Greater London Authority (GLA) about access to nature in the city, health, and adaptation (London Wildlife Trust). Our visit was thus a dual discussion on Thames River protection and access to nature. Launched in 2012 by the Environmental Agency (EA) and the GLA, the Thames Estuary 2100 Plan (TE2100) is a governmental plan trying to adapt the Greater London area to present and future flood risk (D'Souza & Penny, 2024).

The Environment Agency

This public body was created in 1996 to protect the environment and to tackle environmental hazards in England. Sponsored by the UK government's Department for Environment, Food and Rural Affairs (Defra), the EA is an operating, regulatory, and licensing authority. Land regulation, conservation, waste management and water pollution are among its competences, but the Environment Agency's main mission is to address floods. This includes flood risk management installations, flood forecasting, awareness raising, political lobbying and technical advocacy. Headquartered in Bristol, the agency is led by a chairman (currently Alan Lovell) under the supervision of the Secretary of State for Environment, Food and Rural Affairs. As for its budget, worth £1.9 billion (2023), it mostly consists of Defra financing and revenues issued from licences such as fishing licences, navigation rights and abstraction licences (Environment Agency, 2023).

Figure 17. Mikaela D'Souza presenting at Walthamstow Wetlands. © 2024 Valentin Salperwyck.

The reason for our visit was to discuss adaptation planning tools regarding rising sea levels and pluvial flooding. The discussion concerned how adaptation can be achieved regarding the numerous cities, the many settlements along the Thames estuary between London and the sea, the public and private assets built up on the banks of the Thames and regarding local specificities due to several municipalities embodied in the project. The attended meeting was also to be understood as an indirect dialogue with the GLA which is working on London's climate adaptation and with the Thames Tideway Tunnel, a privately financed infrastructure project also aimed at preserving the capital from floods.

What Is the Thames Estuary 2100 Plan?

D'Souza and Penny first explained that the Environment Agency is mainly responsible for rivers and reservoir safety and, at a local level, for surface and groundwater risk of flooding. 1.42 million people, around £321 billion private assets and numerous public infrastructures are concentrated within the Thames estuary. As current infrastructures are ageing, flood risk is high (McGlone, 2023).

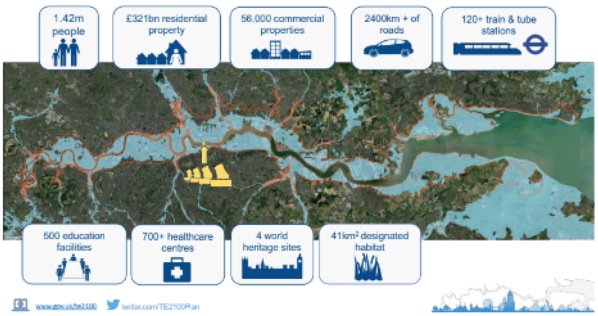

Figure 18. Assets along the Thames Estuary. Source: Environment Agency.

After a short introduction to London's flood management history, they specified that artificial embankments were built early (end of the 19th century) and raised several times after striking due to floods' magnitudes.. However, as flood patterns in the area are a combination of heavy rains and tidal effect (an increasing vulnerability due to sea-level rise) artificial embankments, no matter the height, offer insufficient protection today. The Thames Barrier was built in 1974 to address the tidal effect. Originally planned to last until 2030, it has been used more than expected which has affected its projected lifespan (Hanlon, 2014).

Hence there is a need for renewed solutions against accelerating tidal and rain hazards especially since climate change consequences are growing and remain highly uncertain. The acceleration of sea level rise has more than doubled since the 1990s. Sea levels are expected to rise 1-2 metres by 2100, which demands for long-term adaptation planning.

The idea behind the TE2100 is to adopt a "flexible approach to flood adaptation" (D'Souza & Penny, 2024). Indeed, revising every five years the protection the flood barrier provides is a flexible approach to decide whether to improve the defence. The project has not only revised the protection for tidal flooding, but it has also taken heavy rains into consideration for barrier improvement decisions. D'Souza and Penny introduced the current retro planning as follows:

- By 2035, a decision must be made for what will be put in place by 2070.By 2050, further planning decisions will be made for the end of the century.
- Infrastructure building should start by the middle of the century.

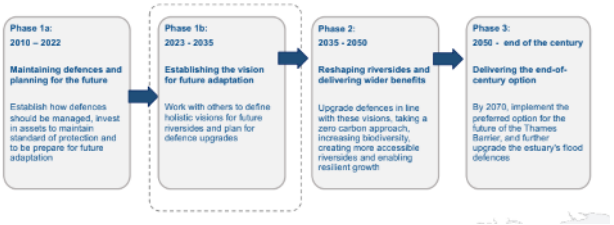

Figure 19. Phases of the TE2100. Source: Environment Agency.

However, for the moment, D'Souza and Penny remind us that no decision has been made about what infrastructure will be adopted and four options are still in discussion:

- Upgrade the already existing Thames barrier.
- Build a new barrier (down the estuary).
- Develop a new barrier with locks.
- Excavated flood storage area (i.e. reservoirs to address pluvial flooding specifically).

These different scenarios not only express the high level of uncertainty regarding the future but also the need for a holistic approach. Building a new barrier is probably the most efficient, but it may be more expensive than upgrading the existing one. On the other hand, technical concerns may require a new barrier with locks. How do we integrate this within the landscape? These questions were part of D'Souza & Penny's speech about the impacts of this project on the estuary and its surroundings.

The choice to hold this meeting at Walthamstow Wetlands was meaningful. The site, which is owned by Thames Water, is one of the largest nature reserves in Europe and is a safe oasis for the biodiversity that once thrived

throughout metropolitan London (Kempton Nature Reserve, n. d.). The site's design clearly illustrates the desire to integrate the preservation of biodiversity to climate adaptation. Desires reminiscent of the urban revegetation plan discussed with GLA and the use of rubble excavated by Thames Tideway Tunnel during the digging of the drainage system to develop natural reserves along the Thames.

The Adaptive Pathways Approach

Given the value and importance of the assets at stake, including the City of London, the EA has no choice but to take climate change very seriously. Their plan is necessarily geared towards the long-term for two main reasons. First, because protecting such a big area from natural hazards requires heavy infrastructures whose implementation takes decades. Second, because nobody knows precisely what the future will look like. Climate change may be more acute than expected, or less, depending on the accuracy of our current models and especially on the future trends of anthropogenic greenhouse gas emissions.

The project is called Thames Estuary 2100 in reference to the deadline of the solution delivery. This raises the question: to what extent can such a distant deadline be relevant if it is based on unstable requirements? The adaptive pathways approach is a way to deal with the uncertainty associated with future climate change. The flexible planning approach, meaning moving from one solution to another as flood risks escalate over time, is effective when the options are simple to implement and to discard. However, this strategy is unsuitable for large infrastructures like reservoirs and the Thames Barrier. This means that whatever the option the EA ultimately selects, they have to be sure it is feasible and fits present and future climatic conditions. The EA has a close partnership with the Weather Agency, nonetheless, experts work under high uncertainty regarding climate change and are unable to estimate the estuary shape in 2100.

Despite this inextricable uncertainty, is it possible to ensure the political, financial, and technical continuity of the TE2100 over decades? Political turnover and emerging climate risks may relegate Thames estuary protection to secondary priority. Monetary challenges can arise unexpectedly, either from unforeseen expenses or the bankruptcy of a key partner. In fact, money is already lacking, as we will continually discuss in this report. Finally, infrastructure developed today can become obsolete in 2070 in the face of new technologies and new climate models.

These are not only questions for us as students but also for our presenters as professionals. It means that TE2100 is moving in the mist, which is interesting given the assets and the means at stake.

A Myriad of Actors to Coordinate

One of the main challenges the EA faces regarding the Thames River protection infrastructure is privatisation and ownership. The privatisation of the barrier leads to a myriad of actors to coordinate for goals unclearly established. The EA only owns 12% of the Thames' protection infrastructures, the other 88% belong to local governments or the private sector (D'Souza & Penny, 2024). The challenge is to negotiate with 25 different city councils along the estuary and a privately managed sewage system about the upgrading or creation of new protective infrastructures, knowing that most local authorities cannot afford such major infrastructure. Dividing the project into three spatial sub-areas is a way to make it financially less heavy but also adds a layer of complexity. Coordination also includes the Weather Agency whose predictions will necessarily be mobilised for arguments during negotiations.

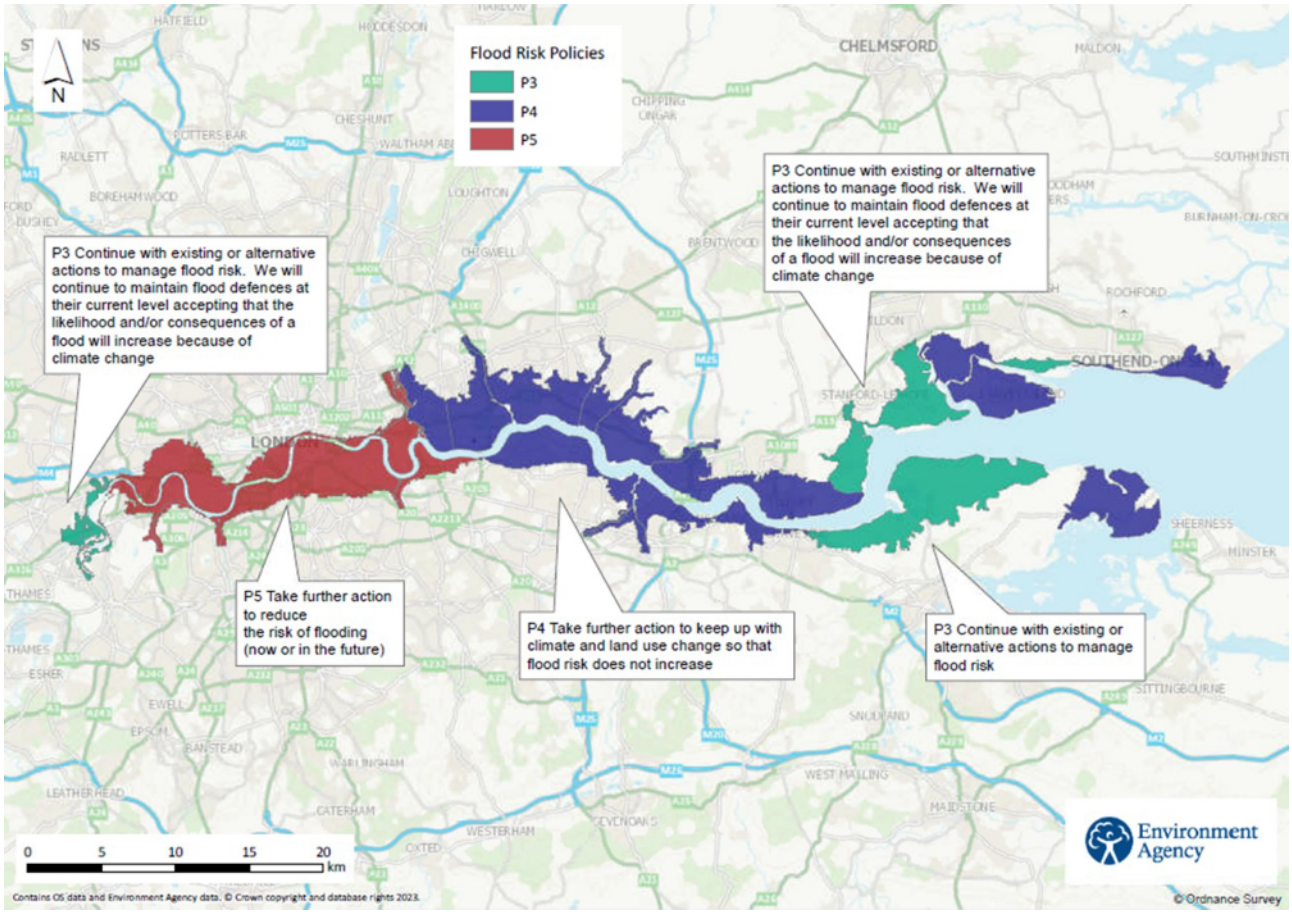

Figure 20. The three sub-areas of TE2100.
Source: Environment Agency.

Another question regards governance and leadership. The scale of decision making is not clearly defined and leads to less efficient decisions making. Should such decisions be local self-tailored measures or global systemic approach? Currently, both global actors (the Environmental Agency and the Greater London Authority) and the local city councils struggle to take the lead. On the one hand, the team that designed Thames Estuary 2100 on the EA side left: "losing the project leader also meant a loss of vision and leadership" (Restemeyer *et al.,* 2018). On the other hand, city councils can hardly feel legitimate to embody the project as they have not really been involved in the development process. In the end, the sense of ownership is quite low on both sides (Restemeyer *et al.*, 2018).

Flood protection measures in the adaptation plan TE2100 also face other problems as risk perception shifts. Because the efficient barrier system has minimised the occurrence of flooding in most people's minds, perception of the risk associated with such events has become normalised. Given that nowadays flooding very rarely causes fatalities or only rarely in the Thames River estuary, lots of actors don't see the necessity to invest in infrastructure anymore. Flood management is therefore seen as a far-off concern and does not compete easily with immediate pressures on councils' budgets (Restemeyer *et al.*, 2018). To tackle this problem the EA also put effort in awareness-raising and information campaigns among citizens.

Finance Gap

TE2011 will have to deal with a significant financial gap. Currently, in 2024, the estimated cost of the infrastructure is £16.2 billion, which already corresponds to an increase of 50% since the first draft of the TE2100 in 2012.

“Inflation, flood defences deteriorating faster than expected [and] a better understanding of the current defence system” (DEFRA & EA, 2023) explains this increase. However, the project is still at its beginning stage and cost revaluation rarely goes without high expenses.

Even if £16.2 billion is the final total cost, there is an outstanding issue: apart from the £5.2 billion granted by the national government (as part of the Flood Defence Grant in Aid), not a single penny has been secured so far. For the moment, £11 billion are unaccounted for (McGlone, 2023). However, different opportunities are being explored by the EA including user fees, city council efforts, and grants private developers' investments (DEFRA & EA, 2023).

According to the Flood and Water Management Act (2010), riparians should pay for the maintenance of the flood protection network as their homes will be automatically upgraded due to the provided protection. User fees are fair in the sense that those who will benefit from the estuary protection will pay. Yet users did not participate in the TE2100 decision-making process and could perceive that option as more or less imposed on them. Would the ‘users’ concerned by the fee have had the choice, they might have gone for a cheaper option, or for a solution that they are more inclined to pay for. The same concern arose from our meeting about the Thames Tideway Tunnel which partly relied on user fees to fund its massive drainage system. In both cases, we asked ourselves: is this process fair and democratic? And could it be cheaper?

The idea of using insurance as a novel funding mechanism for adaptive infrastructure was also discussed. Insurers have strong incentives to invest in adaptive pathways in urban areas. As the risk of natural hazards decreases, their potential payout obligations in the event of a catastrophe also diminish, making the financing of adaptive infrastructures potentially very interesting for financial savings. Additionally, public authorities could leverage this by shifting the responsibility for construction to the private financial sector. Such a partnership could create a win-win situation.

Figure 21. The Thames Barrier. © Ken Brown.

Meanwhile, city and borough councils cannot provide suitable funding either. As the EA representatives told us at Walthamstow Wetlands, the organisation is already struggling to respect their budget assignments and may not want to add more long-term costs into the project, whatever benefits they can expect from it.

Mobilising charities and developers rely on what Penny and D’Souza called a “benefits realisation approach,” also known as a co-benefits approach. Making the estuary banks more pleasant (green spaces, leisure facilities, and nature-rich parks), fostering biodiversity and improving landscapes may increase the value of real estate (not to mention flood risk diminution) and therefore become an incentive for private investment. Preserving or even improving river banks is not only a matter of finance but also, more broadly, of marketability. Indeed, with heavy infrastructure such as the Thames Barrier or high embankments as protection, there is a risk of spoiling the landscape, which is unlikely to be accepted by riparians and local authorities. Embellishing the estuary is consequently a primary necessity for GLA and EA.

The EA will have to keep in mind these questions when exploring long-term funding options. In conclusion, the main question this visit raised is that the financial gap presents a significant challenge—if not the main one. However, we wondered if it is prudent to begin the project design even without knowing the funding source? On the other hand, if the EA delays action until funds are secured, it is likely that London could be underwater by the time financing is arranged.

Figure 22. Prof. Parrinello and students at the TE2011 presentation. © 2024 Valentin Salperwyck.

Food for Thought

The Thames Estuary 2100 plan is a rife with paradoxes. The plan seems a complex world with little anticipation space regarding the uncertainty of future climate projection. Adding to that, the complex coordination of actors sometimes reluctant to invest, incomplete financing, and lack of leadership of the project. The TE2100 presentation can be put into parallel with the visit paid to the Greater London Authority, where a significant discussion about access to nature and the importance of integrating nature into urban areas arose. On the other hand, the heavy infrastructure envisioned is similar to the massive drainage system, the Thames Tideway Tunnel, which raised questions about the financial procurement and the social implications.

QUESTIONS RAISED

- *Is the TE2100 project feasible given the numerous actors involved, some of which have neither the means nor the desire to participate or provide leadership?*
- *How can the Environment Agency engage with a centenary project that puts millions of lives and billions of pounds at stake without knowing how to finance it?*
- *How do we ensure political, financial, and technical continuity of the project over the following decades?*

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Visualisation showing cross section through the Thames Tideway Tunnel, Central Victoria CSO site. Source: Tideway

2.2 PRIVATE SECTOR

2.2.a Thames Tideway Tunnel

Maëlle Roux
Timothé Sire

On our journey into climate adaptation finance, the central milestone was the brand-new Thames Tideway Tunnel project by *Tideway London,* the infrastructure provider company.

Figure 23. Sciences Po Students arrive at Tideway London's office. © 2024 Valentin Salperwick.

Matthew Parr, the Director of Strategy and Regulation at Tideway London, kindly presented his extensive knowledge about the infrastructure project. Thames Tideway Tunnel is a 'super sewer,' roughly 25 km long and over 7m large, which will be running beneath the River Thames from Acton to Abbey Mills. Construction of the tunnel started in 2016 and has been delivered in phases with a handover expected in 2025 (Parr, 2024). This combined system carrying both sewage and rainwater run-off will be 30 to 60m and transport water treatment facilities.

The project was originally designed to prevent sewage pollution in the river Thames since it has been a persistent problem for many years. Indeed, London is facing a huge sewage crisis where all firms are failing pollution and sewage tests. An EU infraction procedure was released which pushed for an infrastructure improvement. The existing sewage system has been upgraded but discharges in the River Thames still occur 60 times a year on average of around 18 million cubic metres. The Thames Tideway Tunnel reduces this frequency to 4 times a year and up to 2.4 million cubic metres. More recently, the Tunnel is also tackling flooding risks by relieving pressure on the normal sewage system in case of heavy rain. It will store excess water and thus act as a flood prevention infrastructure. This project is central to London's climate adaptation plan.

Figure 24. Matthew Parr presenting to Sciences Po Students. © 2024 Valentin Salperwyck.

The framing of this project and its acceptability to investors relies on a broader vision than this already ambitious sewage system. First, the national significance of the project is highlighted since the goal is to meet regulatory requirements applying to the entire country. Environmental and health impacts will be improved both in the biggest demographic basin of the United Kingdom and downstream of the Thames. Moreover, river reconnection initiatives are implemented along the Thames as part of the project with the creation of green spaces and communication tools. Popularity and social concerns around the projects seem to have been part of the plan from the beginning.

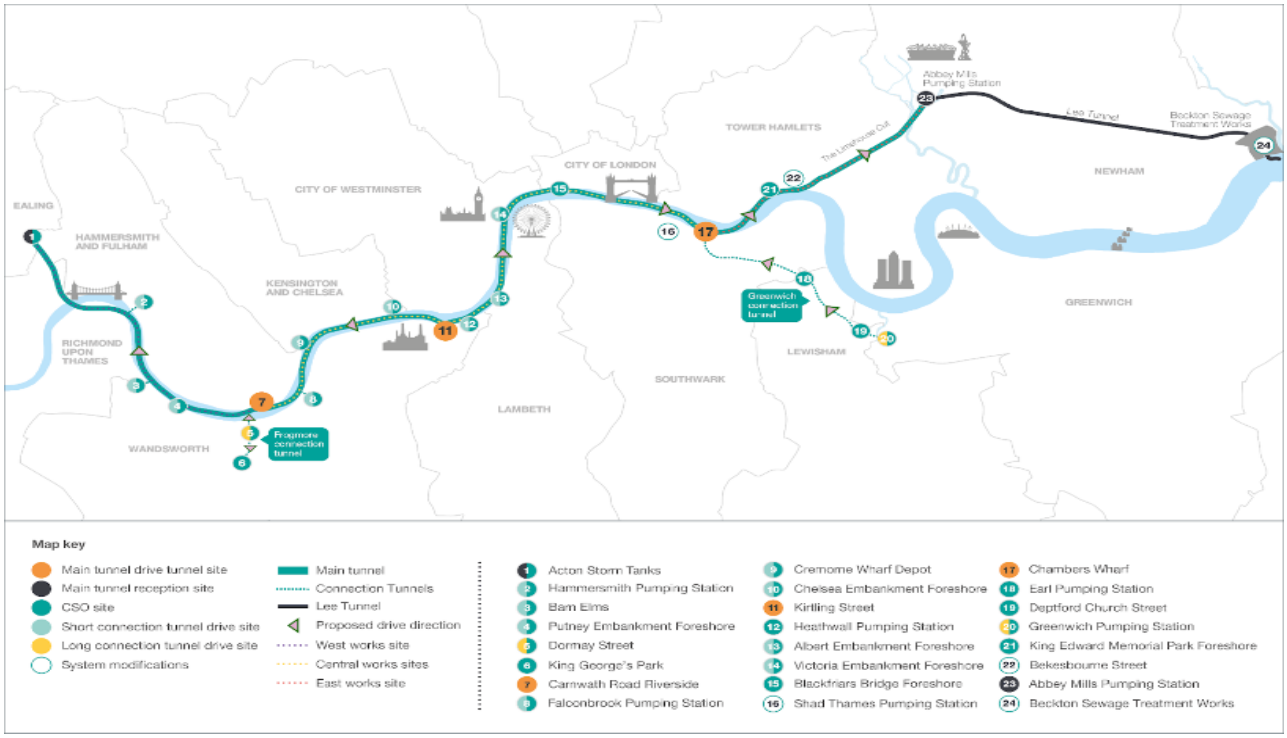

Figure 25. Map of Thames Tideway Tunnel.
Source: cjassociates.co.uk

Some particularities of this project attracted our attention because they resonated with the financing problematic driving us on this study trip. Indeed, this type of adaptation of water infrastructure is a first of its kind in terms of public-private partnership. The Thames Tideway Tunnel is a £4.2 billion infrastructure, difficult to finance both by the private and public and still, London managed to do it all. How does this work? We will cover more in depth the issues of financing and funding this type of large-scale project.

The Financing Process

With the Water Industry Act and the privatisation of the environmental and water sector in 1989, the Thatcher Administration escaped European regulations temporarily (Findeisen, 2024). However, it only made it more complicated to finance the infrastructure needed when it became clear that sewage regulations were not only an administrative formality but also a major public health issue.

In 2008, the Department for Environment, Food and Rural Affairs (Defra) asked the Thames Water Company to carry out the Tideway project. Kemble Water, the equity consortium owning Thames Water at the time and the monopoly provider of environmental services in England's Southeast refused, arguing that it would be too risky and costly for them. A project of this size would easily distort the risk assessment of the whole company. As the government lacks leverage to negotiate and enforce anything but remain accountable for the situation by their citizens, they had to find a more innovative solution.

The Secretary of State to Defra offered to use a new policy instrument called an Infrastructure Provider: a "specific purpose" company, publicly and privately financed to build the Thames Tideway Tunnel. Its structure is hybrid with both public actors such as the EIB and private actors previously selected by Defra which can unlock equities in capital markets (Findensen, 2024).

This financial structure evolved through a complex process involving multiple stakeholders and innovative financial mechanisms. Initially, Thames Water's strategy to increase borrowing and pay substantial dividends to shareholders strained its ability to fund infrastructure projects (Byatt, 2013). This led to the creation of the Bazalgette Tunnel LTD, a special purpose vehicle (SPV) composed of investors like Allianz, Dalmore Capital Limited, INPP, Swiss Life, and DIF.

If this institutional structure has been tailored directly for this investment scheme, it was also clearly framed as a precedent for future public-private partnerships. The Tideway Financing model is currently being used for the development of the new $20 billion nuclear plant at Sizewell (Suffolk, England).

The Funding Process

We have seen that nothing could be triggered without a thorough financing strategy implemented beforehand. Once the project attained its operational phase and no major trouble was reported, the funding part comes into play since the infrastructure now must be 'reimbursed' and the investors need to get back their initial bet in addition to their return. The different lenders, considering the amount of money invested, will progressively be repaid over several decades through staggered operations. But where does the money required come from?

For a project like the Thames Tideway Tunnel, there are several options available which do not put the burden of the reimbursement on the same actors. While those choices will be analysed later in the report, we will discuss here specifically the 'user pays all' choice. Indeed, if the funding method adopted by Tideway induces that no money comes from the public sector, the entirety of the funding will be paid through different service/user fees and tariffs. While investors paid for the infrastructure, consumers will progressively pay them back over a period of 120 years. More precisely, Thames Water consumers will see their water bill increase by a range "well within the initial range of £20-25", according to Tideway's February 2024 estimations (Parr, 2024). Thames Water will then be able to gradually pay for construction, the debt service as well as the return for equity investors.

Importantly, apart from being able to pull off the infrastructure in time and preventing sewage pollution and its consequences, this method seems to assure a certain intergenerational justice. Indeed, contrary to a public debt issued through option 1 which passes the costs of projects to future generations, even though they didn't benefit directly, financing through users' money spreads the cost more equitably among those who will directly benefit from the infrastructure. The financial responsibility remains with the current and future users of the system. This approach aims at aligning the costs with the benefits, ensuring that those who use and benefit from the infrastructure are the ones primarily responsible for paying for it. Additionally, spreading the repayment over such a long period helps mitigate the immediate financial impact on consumers, making it more manageable for current ratepayers while still providing essential infrastructure improvements for the community.

Questions about Financing and Funding Models

In considering the financing structure of infrastructure projects like the Thames Tideway Tunnel, a pertinent question arises: could it be achieved more cost-effectively? While the decision to solely rely on users' money through Thames Water consumers' bills for funding over 120 years may seem equitable in terms of intergenerational justice, it raises concerns about the overall affordability and efficiency of the project. Reports from the Financial Times already indicate that consumers find the

projected increase in their water bills unsustainable (only 16% think the next five years increase is “manageable”), casting doubt on the feasibility of the overall mode (Plimmer, 2024). Not to be misleading, it is important to note that the concerns of Londoners concern the overall increase in their water bills, of which the portion related to the Tideway Tunnel constitutes only a fraction.

From a purely financial standpoint, private loans tend to be more expensive than public ones, as public entities are typically perceived as more trustworthy borrowers. Therefore, the decision to opt for private financing may entail higher costs due to interest payments and other financial charges. Considering this, and the reflections which are drawn from our field trip, we wonder whether it is worth undergoing the bureaucratic complexities and transaction costs associated with Public-Private Partnerships (PPPs). Nonetheless, the project takes place in a particular austerity context, which partly explains why there were no viable public financing alternatives available.

The austerity path undertaken by the UK government, which has emphasised the involvement of private capital in infrastructure projects, has faced scrutiny regarding its efficiency and cost-effectiveness. The privatised Water company Thames Water, providing 15 million people with the most essential resource is in a precarious financial situation. The UK chancellor Jeremy Hunt, in charge of the nation's finances notably argued that it would be “completely wrong if customers [...] had to pick up the tab for bad decisions made by its managers or owners." He adds that there is already serious concern about a potential renationalisation considering a “messy debt restructuring” the company sponsoring the TTT faces (Fleming, Plimmer, 2024). It becomes imperative to assess whether the potential benefits of private financing outweigh the drawbacks, particularly when considering the long-term financial implications for consumers and the public purse.

State Disempowerment?

Public-private partnerships (PPPs), raise significant concerns about the empowerment of finance and the exposure of states to uncontrollable risks. As noted by Findeisen (2024), "most analyses conclude that financial statecraft undermines state capacities." This underscores the potential risks associated with ceding control to private entities, which may prioritise profit maximisation over public interest and welfare.

The decision to rely solely on private financing for projects like the Thames Tideway Tunnel necessitates a careful evaluation of the implications for public accountability and transparency. While PPPs offer a mechanism for leveraging private investment and expertise, they also involve giving up some control the State has over important infrastructure assets. This raises interrogations about the balance between private sector efficiency and public sector oversight, particularly in ensuring the long-term sustainability and affordability of essential services.

However, some of these questionings can be tempered considering the context, and the way operations were conducted. Throughout the project, the state technically remained a key stakeholder, by supervising the entire operation process. This was conditional to the eventual triggering of the government support package which in the end didn’t happen. The Ministry of the Environment successfully navigated the privatised and financialised environmental sector, demonstrating the importance of developing risk-sharing mechanisms and coherent financial strategies to address the climate crisis. This is why in a context of state disempowerment, Findeisen argues that state capacity was in the end paradoxically reinforced (Findesen, 2024).

As for the question of the different funding mechanisms a PPP can go through, we'll discuss these topics in more detail later in the report.

QUESTIONS RAISED

- *How is it possible to finance large infrastructure projects without financially overburdening consumers?*
- *Can PPPs bridge the gap between a disempowered and financially restrained state and the imperative to adapt quickly?*
- *Are PPPs a solution to ensure inter-generational and social justice when working with the private sector?*

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City of London skyline and Millennium Bridge.
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2.2 PRIVATE SECTOR

2.2.b Bankers without Boundaries

Mathilde Perreira
Alice Tort

Bankers without Boundaries (BwB) is a non-profit working with private and public institutions to facilitate the financing of "high impact projects that benefit the environmental and social good." Their clients are governments, institutions, cities, and foundations, and they "provide advisory and research services to mobilise capital" (BwB, n.d.).

Figure 26. Harry Wain presents to Sciences Po Students. © 2024 Antoine Tisserant.

The presentation given to us was technical, outlining BwB's work and focusing on adaptation towards the end. The role of BwB in "unlocking" access to capital for climate-related projects was emphasised, particularly for decarbonisation of the urban environment. BwB do two main things: they provide information to better facilitate efficient use of money towards environmental goals, and they bring actors able to face those challenges together, bridging language gaps between them. They do this at every step of a project timeline. As former bankers, part of the knowledge which BwB bring to the table is the knowledge of the different financial instruments and sources ("investor types") which can be leveraged for projects.

Private Sector	Financial Institutions	Banks	Equity Investment; Debt Financing (e.g. Term A Loans, Bond Issuance); Concessional & Non-Concessional Debt; Grants; Guarantees.
		Alternative Inv/Asset Owners	Equity; Tax Equity Investments; Green & Sustainability-Linked Bonds; Investment Funds.
		Insurers	Sustainability-Linked Products; Green Bond Investments.
	Corporate	Project Owner (Borrower)	Equity Investment; SPVs; PPPs.
		Project Customer	Equity Investment; Offtake Agreements; Green Premiums.
		Investor	Marketing; sponsorship; corporate impact budgets; employee benefit packages
	Public Sector	Governments / Policy Makers	Grants; Green Bond Investments; PPPs; Tax Incremental Financing; Social Impact Bond; Seed Capital.
		MDB / State Financiers	Traditional Debt Financing; Grants & Donations; Credit Guarantees.
		Export Credit Agencies	Debt Financing.
		Citizens	Crowd-funding; Micro loans

Figure 27. List of "investor types for decarbonisation" provided by BwB, illustrating the kind of knowledge they leverage to unlock capital for decarbonisation projects. Source: BwB, 2024.

The presentation finished with a focus on adaptation financing. It first outlined the necessity for adaptation, then which strategies BwB were able to identify to make adaptation "bankable"—that is, a selling point for capital investment. Below is a list of such strategies provided during the presentation. An interesting example, explained at length during the presentation, was the ability of insurers to pay for necessary ecosystem services, in a logic of safeguarding their underlying assets. Insurers have a vested interest in making sure that their assets are protected against the effects of climate change from a certain threshold, after which they will not be able to operate a profitable business model. They can thus be interesting investors for adaptation projects.

Revenue Stream	Scale	Timeframe	Level	Payer	Value	Generation
Credits	Large	Long Production requires long time	International and local	Companies	High demand for credits	Direct generation through creation of offsets
Insurance	Large	Long - Depending on willingness of contracting actors	Local or state level	Insurance companies	Ability to safeguard underwritten assets through risk mitigation	Indirect. The insurance company benefits from the reduced risks to insured areas and the project receives funding for development.
Cost reduction modelling	Intermed.	Short-to medium term	Limited to the project and directly affected community	No direct payer. Who finances the development covers the cost reduction indirectly	Projects which can biodiversity to enable them to reduce their costs	Indirect investment in biodiversity to "green" an infrastructure project allows risk and resource waste reduction
Product & Commodity Selling	Intermed.	Short-to-medium term	Depending on the project	End consumer	Depending on the sold product	Direct selling. Product and commodities are generally a secondary benefit of including a nature angle – especially with pure natural infrastructure
Ecosystem Services Tax	Potentially large*	Depending on the regulator	Local and state level	Polluting companies	Companies or projects tend to be unwilling to do that but if regulated they respect it	Revenue generated by taxation and redirected towards ecosystem for pollution reduction and similar activities

Figure 28. List of strategies to create value in biodiversity and infrastructure adaptation projects.
Source: BwB, 2024.

BwB have an interesting position as middlemen across different languages between private and public actors. Their background is more private, and some of the declarations made during the presentations were frank: cities, or public entities, don't know how much money is needed and how to leverage it for projects. Yet they need this know-how to conduct their projects. Paradoxically however, this was perhaps the least accessible presentation we attended during the trip, because of the language barrier, many investment terms were unfamiliar to the audience. Once this was made clear, valuable explanations were provided by the speaker. In this sense, this presentation was a very valuable experience, in facing us with a different perspective from the public sectors. Moreover, this presentation was valuable in outlining exciting and innovative elements in finance adaptation. It gave many of us the impression that things are moving fast in this sector.

QUESTIONS RAISED

- *Should bankability be the main reason to conduct adaptation projects?*
- *To what extent is the lack of expertise an obstacle for financing climate adaptation?*

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Greenwich Park with a view on London city center. Source: theculturemap.com

2.3 CONSULTANTS AND INTERNATIONAL ORGANISATIONS

2.3.a Climate Policy Initiative

Louise Renaudie
Jenna Schulmann

While there is a temptation to understand climate finance strategies as a subject solely under the public sector's domain, evidence shows that the global private sector plays an equally important role. The private sector's consultancy and non-profit arms seek to reinforce the efforts of the public sector and are instrumental in helping national, regional, and municipal bodies reach their long-term and interim climate goals. The private sector can move at a faster pace than the public sector and secure funding quicker and, often in more cutting-edge ways, to quickly support adaptation projects. The private sector can produce research and recommendations, finance the projects, and develop improved infrastructure systems to support water, agriculture, and other environmental sectors. It should be noted that these organisations cannot act alone, and they require the support and collaboration of the public sector. Private sector involvement does not equate to the disappearance of the public sector or the weakening of its involvement. The public sector should consider the private sector as a safety net and the private sector should consider the public sector as their safety net—both eliminating the burden of risk for the other when need be. If integrated well, the private sector should strengthen the public sector's capacity to build a sustainable environment and its public perception. Transparency in monetary allocation within terms of agreement between the public and private sectors is a key step to ensuring the two sectors work as a harmonious climate finance mixture.

As part of our research, we met with such mediating actors: one consultation firm, the Climate Policy Initiative, and one international organisation, C40.

What is CPI?

Climate Policy Initiative (CPI) is an independent and non-profit organisation of analysts and advisors specialised in policy and finance, working to improve energy and land use policies worldwide, with a particular focus on finance. Founded at Stanford University, CPI operates from six locations worldwide, including Rio (Brazil), New Delhi (India), Jakarta (Indonesia), London (United Kingdom) and San Francisco (United States), the latter being their main office.

CPI focuses on finding finance solutions to drive investment and support policy makers coming from governments, businesses and financial institutions to design and implement sustainable finance and development solutions with the goal to drive economic growth while addressing climate change. However, CPI has no city members because they have no intention to act as a city network or to be in competition with C40, rather, they work with organisations. Their guiding principles are the following:

- Accelerating finance solutions to drive billions in investment in developing countries.
- Bringing clarity to progress on climate finance goals.
- Driving energy access in the most underserved regions
- Support for policymakers and investors in energy finance.
- Reducing the cost of government support for renewable energy
- Helping governments assess the impacts of innovative aid approaches.
- Leveraging data science to deliver robust climate finance and policy insights
- Developing robust methodologies to ensure consistency and comparability in our data.

CPI mainly focuses on developing countries. Their work revolves around four pillars: assessment, improvement, scaling, and

bridging. CPI also publishes annual reports on public and private financial flows. They track finance sources and destinations thanks to data collection and aggregation.

Figure 29. Presentation of CPI by Priscilla Negreiros, at their office in London. © 2024 Valentin Salperwyck.

While in CPI's London office, we also had the opportunity to meet the team of Cities Climate Finance Leadership Alliance (CCFLA), of which CPI is the Secretariat. CCFLA, launched in 2014 at the UN Secretary-General's Climate Summit, specifically focuses on city-level climate action, aiming at closing the climate finance gap for urban subnational climate projects and infrastructure by 2030. They advocate during COPs and in reports for an improved cities' access to climate finance. CCFLA works on a project-based funding model, with major donors including two German ministries, Bloomberg Philanthropies, and the International Climate Initiative (IKI).

Why Did We Visit CPI?

Our visit to CPI was justified by the organisation's expertise in the financing landscape when it comes to climate. Indeed, their work in tracking financial flows was valuable in helping us understand the current state of climate finance globally. Additionally, the visit aimed to learn more about their role as consultants and their relationships with both public and private actors in climate finance.

Key Themes From our Discussion with CPI

During our conversation with CCFLA, our team was curious to understand (1) the ethics of consultancy involvement in climate finance development, (2) the project development procedures that the CCFLA creates to be used by cities, (3) the optimal timing to invest in climate strategies from their point of view, and (4) the mechanisms that they use to track the success and progress of their projects.

First, the CCFLA discussed the ongoing tensions within each project they do to ensure that the local community that will be impacted by their plans has their voices integrated into the development of the strategies. They acknowledged that as a consultant you most often are an outsider coming into another community to aid in plans for them and thus means that you must treat the community as an expert to ensure the long-term sustainability of the proposal.

Second, CCFLA was transparent about its project development process for any given climate finance case, acknowledging that a key challenge is being flexible since a climate finance kit developed for one city or governing body will have to change for any other given city. CCFLA additionally noted that the creation of climate finance kits for municipalities is difficult in part due to a tendency to make too broad of strategy propositions, thus, they alter their kits through trial and error in an attempt to standardise best practices. As part of their standardised assessment framework, they develop different conclusions to be evaluated by local policymakers, researchers, and investors.

Third, CCFLA detailed the optimal timing for investment in climate finance plans and the necessary conditions to create a sustainable duration and environment framework that enables green growth alongside green infrastructure. Some of the enabling conditions that were discussed include national

governments' diversifying sources of income. Diversification of sources of income for a national government can take many forms, but one form involves transitioning from complete dependence on fossil fuel industries towards more environmentally sustainable industries such as wind and solar. The right to invest in climate finance is when a government is actively seeking out this type of diversification. Government offering of subsidies, tax breaks, and grants can incentivise investment, particularly by the private sector, in the climate finance solutions.

Discussion: Lessons and Problems

Our discussion with CPI shed light on the responsibility of developed countries in financing adaptation projects in vulnerable countries, first because of their lack of financial resources, and secondly because of the significant imbalance in terms of responsibilities between developed and developing countries, as developed nations are historically the largest contributors to GHG emissions. Developing countries are also considerably vulnerable to the effects of climate change. Developed cities are also critical in this process as they possess more financial and technical capabilities, they can thus contribute to financing adaptation projects in developing countries. This is indeed one of the focuses of CPI, which aims to "accelerate finance solutions to drive billions in investment in developing countries."

CPI's "Global Innovation Lab for Climate Finance", focusing on regional and thematic focus, underlines the importance of prioritising local knowledge in the design and implementation of projects. This indeed puts into question the extent to which tools can ensure this priority is met. Local communities indeed have invaluable insights into their environmental conditions, socio-economic dynamics, and cultural contexts, which are essential for developing effective and sustainable adaptation strategies, and to prevent maladaptation. Local knowledge is crucial to develop effective climate finance solutions that meet the needs of the communities who are most affected by climate change impacts.

We recognise the limitations of private sector involvement within climate finance strategies and do not consider them to be a silver bullet solution. First, some argue that the private sector's involvement in procuring public goods is undemocratic as these groups are not bound to deliver the vision of the public. Second, the scale of private sector investment is a concern. As financial interest lies in large-scale expensive projects, small-scale but critical projects for public well-being will lose funding. However, if integrated well into the public sector's climate finance vision, the private sector and public sector will be working on behalf of the electorate and representing the interests of the majority. Both the private and public sectors must collaborate closely to leverage each other's strengths effectively. Another limitation that arose in our discussion capacity of the private sector and consultants to assist public authorities. Consultants underlined that as they are not there when financial tools are implemented, governments might prioritise certain areas over others, thus undermining adaptation. These issues will be further explored later in the report.

QUESTIONS RAISED

- *Can the public and private sector cooperate to achieve the common goal of financing climate adaptation?*
- *Can the private sector get involved in procuring public goods, respecting principles such as environmental justice and equality?*

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SkyCycle network proposal.
Credit: Foster + Partners.

2.3 CONSULTANTS AND INTERNATIONAL ORGANISATIONS

2.3.b C40 Cities

Lucie Carpentier
Philippine Ciupek

C40 and the Importance of City Networks

In our interconnected world, we cannot think of cities as isolated. It is important to broaden our perspective on urban financing by remembering that the political economy of a city interacts with global actors, and that cities are themselves global actors. As a matter of fact, they are increasingly networked, working together, sharing resources and experiences. Transnational Municipal Networks related to climate change are defined by Heikkinen *et al.* as "organisations that aim to support cooperation between cities to improve their climate change mitigation and adaptation work" (2019). There are currently more than 300 city networks, with a third of them adopting a climate lens.

C40 Cities Climate Leadership Group (C40) is a network focused on urban environmental actions. It is made up of 96 large, wealthy, and influential cities from all over the globe, which represent 20% of global GDP. Our meeting with Sachin Bhoite (Director of Climate Resilience at C40) and Emma Goddard (Manager for Urban Planning and Adaptation Integration) highlighted the role taken by transnational organisations in enabling adaptation finance in cities. Studies have shown that cities, members of networks are more likely to have started the adaptation process than other cities, and that being a member of multiple networks is associated with higher levels of adaptation planning (ibid). However, the activities of cities' networks like C40 come with some limitations that we will also point out.

Figure 30. Emma Goddard presenting at C40's office. © 2024 Fanny Bézie.

The purpose of cities' networks is to facilitate the climate transition through collective action. The urban focus that these networks promote seems relevant and a missing dimension in current international economic and political governance. In fact, cities face specific vulnerabilities but also bear responsibilities and have levers to act against climate change that must be acknowledged. Cities' networks identify the similarities of cities across different national contexts and put them in relations in order to spread knowledge, resources and replicate good practices across the network and even beyond. The strength of networking according to C40, is to make cities realise that they share problems and solutions.

Figure 31. Map of city members of C40 Cities. Source: C40.

Fostering Political Action

The first objective of cities' networks is to foster political action at the local level, with the hope that it will inspire national governments. Cities' networks are particularly important when national contexts don't foster cities' capacities to act. Those barriers can range from political corruption, lack of local taxing power, or more generally an erosion of the public sector. These factors, widely witnessed nowadays, make cities reliant on external help provided by actors like C40, both in terms of financial and technical support (Keenan *et al.*, 2019).

C40 influence goes beyond peer-peer matchmaking activities. As the network has grown in members and funding, C40 also provides technical assistance and guidance to members.

C40 tries to feed cities' ambitions regarding climate change. To be a member of the C40 network, cities must design a Climate Action Plan, demonstrating strong commitments to both mitigating climate change and increasing its resilience. Cities must be willing to outline targets and strategies and to provide data on their greenhouse gas emissions, climate vulnerabilities, and climate actions to the C40 network. This data is used to track progress, assess impacts, and share best practices among member cities. However, it was raised in our discussion that C40 doesn't have any power of sanction, and cities involvement and compliance with their plan is purely up to the city's good will, which can vary depending on political momentums. C40 lacks the tools to ensure the continuous commitment of cities. Nevertheless, C40 can earmark cities as "Inactive" if they fail to meet the requirements for 12 consecutive months. Our two presenters were nevertheless quite positive and stated that cities usually care about their membership in their network.

Cities' Challenges to Adaptation Policies

If mitigation remains their first mission, the network also highlights the importance of tackling the adaptation issue among its members.

In 2021, C40 published a special report entitled "Focus on Adaptation," reporting 15 actions to increase the adaptive capacity of cities in face

of climate change. They inventoried "high-potential actions" ranging from infrastructure to behavioural actions to approach climate resilience. The first step toward resilience is for each member to build an adaptation plan. Indeed, the best way to improve urban resilience is to anticipate adaptation rather than act retroactively. Anticipative policies are more efficient but also more difficult to put in place, because it requires a lot of trust from civil society, institutions, and financial investors to implement them.

The Two Categories of Challenges Identified by C40 in Most Cities

C40 highlights the difficulty for cities to create a structural socio-political urban environment that enables adaptation policies. Actors from inhabitants to policymakers, lack awareness on adaptation because of insufficient risk and impact assessments regarding the effect of climate change in cities. There are not enough tools to illustrate the need for adaptation. Adaptation measures (like most climate change related actions) are difficult to implement because they require good intergovernmental coordination. The segmentation of urban governance into branches, as well as the competences allocation from national to local governments are challenges to an integrative action plan. Additionally, cities must also deal with a split in competences between the private and public sectors. They do not always have direct authority over the provision of services such as water, electric utilities, or transportation companies. There is hence an additional challenge to coordinate with multiple partners beyond government to build a realistic adaptation plan.

C40 also underlines the challenge cities face to access financial resources to implement their adaptation strategies. First, cities struggle with a lack of data making it difficult to build a project and integrate it in a strong scenario. More broadly, they lack the expertise and resources to develop adaptation projects making it even more difficult to make the projects bankable. Indeed, adaptation infrastructure have a will to be based on user fees payment but are controversially addressed to vulnerable communities who cannot pay. Thus, even if the projects obtain financing, they won't necessarily generate enough revenue, creating a trade-off and an increased pressure on limited public resources to cover the funding gap. For the representatives of C40, involving the private sector becomes necessary but as the projects are not bankable, the private sector is often reluctant to commit. This highlights the fact that financial actors need to engage more in terms of liability, and decisions should not strictly be based on market rates.

Cities also face challenges with their creditworthiness. Because of the current financial system and rating mechanisms, only already powerful cities with resources can access credit. This increases existing discrepancies between cities. The difficulty of cities to access financing solutions can also come from their limited fiscal autonomy due in part to the national context limiting the capabilities of cities to act on their own, which highlights the lack of coordination and perhaps trust between national government priorities and urban development plans.

Solutions by C40

C40 helps to overcome the lack of "engineering" capacities of cities. Indeed, designing and implementing an adaptation agenda requires a variety of capabilities, and this strategy is hard to put in place by resource and capacity constrained cities. Cities must have the technical expertise to assess the hazards, prioritise the risks, and quantify the costs and the potential for risk reduction. Their actions must be integrated into the global strategy of the city (meaning charters, agendas, decision-making processes…) and updated regularly. It is also crucial to provide

staff and institutional support to ensure the accountability of the plan. C40 helps along this process and provides a general guideline on how to design an adaptation plan step by step. Cities are most likely to make a powerful contribution to cutting global emissions and improving resilience if they have a robust climate plan with identified priorities, robust monitoring capacity and good coordination with the national government.

C40 also emphasised the importance of partnerships and collaboration with experts to share knowledge with citizens, firms, and public officers at every stage of the process (from strategy formulation to execution and evaluation) to build individual awareness and collective resilience. Capacity building is key especially at the local level. When we met with them, C40 emphasised the key role played by knowledge and teaching assistant (TA) support in many actions, more than capital investment. This is especially true since cities predominantly prioritise training and knowledge, considering it a free and long-term resource.

The last key element is the importance of private resources and expertise through collaborations with different institutions and long term and continuous funding.

Complementary inputs were added during our meeting with them: the need for coherent policies and behaviour changes, the importance and strength of community driven initiatives, the growing trend of innovative business models and their need for support and the importance of early disaster risk planning. For many cities, especially in the Global South, they shed light on the need to build foundations before moving on to the major complex projects. Those remarks highlight the complexity of adapting a city to climate change: many actors are involved and must work together in the same direction, while having different priorities and time horizons in mind.

To implement their advice, they presented two tools: mainstreaming and climate budgeting.

Mainstreaming consists of the integration of climate risks assessments into every urban and spatial plan, infrastructure planning, and urban policies. It promotes a synergy between environmental policies and other policies to take climate adaptation and mitigation action in every policy field. The objective is the full integration of climate change adaptation as a mainstream development practice. It includes for example climate criteria when assessing capital investment proposals, the incorporation of adaptive measures into investments projects and the assessement of climate impact of proposed investments (C40 Cities Climate Leadership Group & C40 Knowledge Hub, 2022). Indeed, it is important to realise that all kinds of public policies or financial investments have a direct or indirect impact on climate. Mainstreaming is crucial because it would prevent inconsistencies between policies hindering adaptation and would reveal the co-benefits adaptation policies can bring about across sectors.

> *"The objective is the full integration of climate change adaptation as a mainstream development practice."*
> ***Sachin Bhoite*** *and* ***Emma Goddard****, C40, February 15, 2024.*

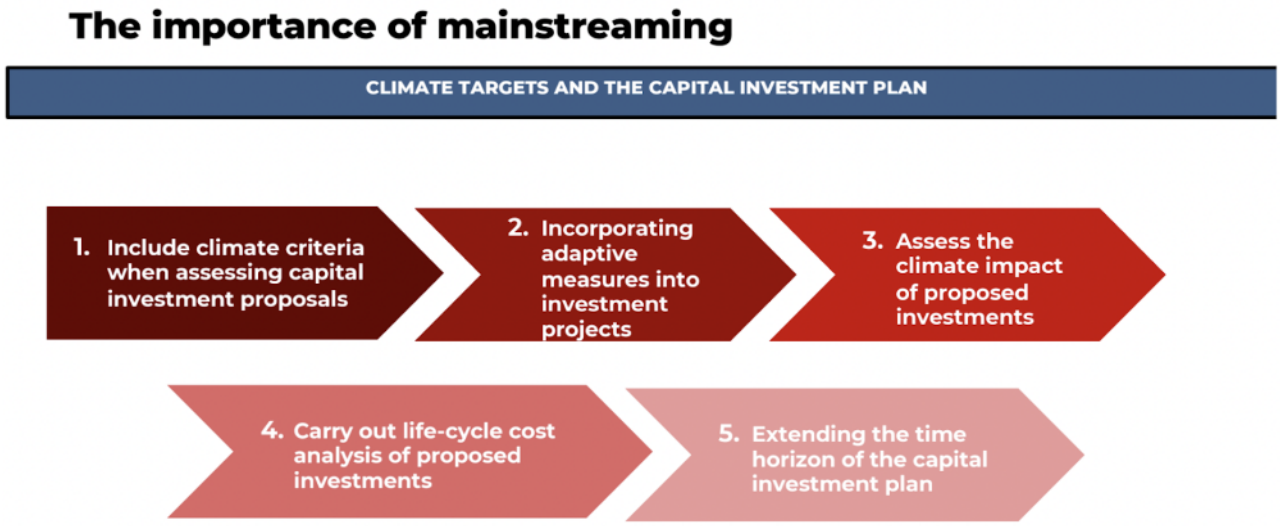

Figure 32. C40's roadmap for mainstreaming. Source: C40.

The second tool presented by C40 is climate budgeting, and it serves mainstreaming. The goal of a climate budget is to make all departments of a city focus on climate change. Inspired by Oslo, a pioneer in climate budgeting, C40 built a step-by-step guide that describes the responsibilities of stakeholder through each step of the process as well as their roles as political, administrative, and technical entities (C40 Cities Climate Leadership Group, 2024).

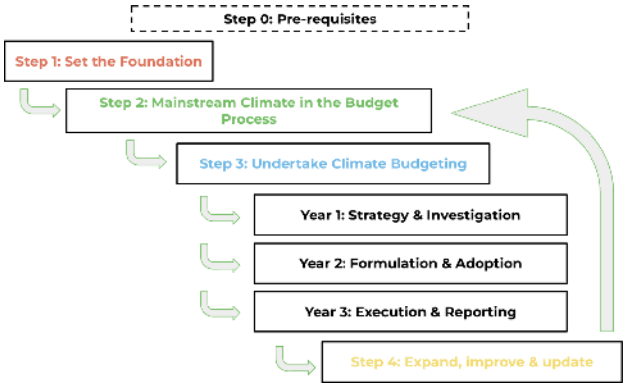

Figure 33. A step-by-step guide to climate budgeting. Source: C40 Cities Climate Leadership Group, 2024.

On top of this 'formal' support, C40 offers indirect help to cities by improving local capacity to attract private investments. The network provides an unofficial backup that 'reassures' investors. C40 explained that when seeking financing sources for a project, being aware that this project already worked somewhere else gives credit to the city and securitises investments. By grouping cities together, they contribute to amplify the voices and give more credit to cities as trustworthy political and economic entities in institutions like the European Union. This way, cities are put in the spotlight. The weight and strength of the transnational municipal network grows as their number of members increases. In the case of C40, the network represents more than 700 million people. The structure of C40 itself reflects this ambition of advocacy and diplomacy: their branch "C40 for Mayors" clearly embodies this political ambition.

Conclusions and Challenges

Finally, let's conclude with some limits to the action of C40 to transform climate adaptation financing that were raised during our meeting.

Firstly, as it was mentioned in the introduction, C40 focuses on already well-equipped cities among the wealthiest in the world like London, Paris, San Francisco, Los Angeles.... One question raised was then about the role of C40 in increasing the financing gap between large cities and the others, and more broadly fostering a competition between cities for resources and financing. This trend is something already witnessed in the last decades with the promotion of a new "climate urbanism" as a marketing strategy used by some cities to attract finance. "Climate urbanism" is analysed by Robin and Broto as an iteration of a neoliberal urban development, geared towards the mobilisation of private capital to finance climate related projects (Robin & Broto, 2021). This criticism reaches further than C40. Networks, as finance, are biased towards wealthy countries: from a study conducted on more than 300 members of city networks, the cities in wealthier countries were the ones showing stronger progress in adaptation planning (Heikkinen *et al.*, 2020). As it was put by Kern and Berkeley, "transnational municipal networks are networks of pioneers for pioneers" (Kern & Berkeley, 2009).

Hence, C40 must not be taken as a representative sample of what cities can do for adaptation. But, as London is part of this elite network, it was relevant to meet them during our study trip.

A second limit of C40 actions was focused on their top-down approach. Indeed, one objective of C40 is to share and replicate good practices across cities all over the world. Their report on adaptation describes high potential approaches that could work in most cities. A concern we had was that the global network's actions ignore local specificities. This echoed research on transnational municipal networks by Keenan *et al.*, which raised "emerging concerns about whether external funds match local needs, how new sources of finance can be accounted for in local decision-making, which actions are prioritised while others are sidelined" (Keenan *et al.*, 2019). However, C40 is aware of this issue, and tries to acknowledge and value local knowledge, and base their work on a "people-focused approach." To overcome this issue, they include local communities and city administrations into the process of designing and choosing the sites of the interventions. Another way to make sure that actions are appropriate to the local context is through starting with a pilot design entirely funded by C40, and then support the city for scaling it up as necessary.

Finally, we were curious to hear more about C40 funding mechanisms. Indeed, the own funding streams of the network can tell a lot about their capacity to have an impact and their independence. Their main funders are major international business and philanthropic donors, among which Bloomberg Philanthropies, Children's Investment Fund Foundation and Realdania. More recently, C40 has attracted a wider diversity of donors (from local and national governments to private companies like L'Oréal), to counterbalance the downsides of "philantro-capitalism" (Acuto & Ghojeh, 2019). Indeed, relying on a few major philanthropists can be a threat to the stability and continuity of the network if the founders come to stop (Acuto & Ghojeh, 2019). Plus, we wondered if C40 accepted funding from everyone. Because they are growing in importance and that such transactions also benefit companies, C40 received offers from oil companies. However, they refuse to receive money from them because of ethical reasons, and because it would damage their public image. The question of funding mechanisms sustaining the network helps us to better understand the extent of the independence of

C40 within the broader political and economic global governance of cities. Despite this diversification of fundings, C40 acknowledges that their budget is constrained, even if relatively well backed compared to the majority of city networks. Two third of the actions implemented among members are funded by municipal budgets only (Acuto, 2016), which seems quite unsustainable given the already overstretched cities budgets. C40 emphasised the importance of offering cheap solutions to cities instead of big infrastructure projects, both because of economic constraints but also because those lighter solutions are more flexible and less risky while still providing climate benefits. However, we can imagine that this lack of available funds reinforces C40's focus only on cities who can economically afford to be climate leaders.

Transnational municipal networks, if they can help to some extent, are far from being the panacea for every city. They are one piece in a puzzle of actors, a "global urban governance" that contributes to the financing of cities' adaptation.

QUESTIONS RAISED

- *How can city networks ensure equity between different-size cities, without fostering the financial gap between these cities?*
- *How to share "common good practices" throughout cities around the world with each their own local specificities?*

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03

Addressing the Open Issues Raised

Drought in Greenwich Park, London, 2022.
Source: london.gov.uk

3.1 Private Finance as a New Income Stream

Amélie Clark
Finn Schlichenmaier
Alice Tort

Our field trip explored a variety of policy instruments being discussed or already in use in London to attract private capital for adaptation. This section will focus on analysing three key instruments for private adaptation finance: the valuation of adaptation, de-risking, and the establishment of a UK green taxonomy.

Valuing Adaptation and its Pitfalls

Quantifying adaptation's monetary value is a crucial measure to attract private finance. Advocates argue that a price tag on adaptation incentivises investments by making it legible for economists and capital markets. It enables investors to prioritise projects, giving an orientation in the adaptation landscape (Verkooiljen, 2024). A common argument is also that monetary values strengthen the ability to get the message of the need and benefits of adaptation across to a broader public (Kill, 2015, p. 10). In broader terms, monetary valuation is a step in integrating adaptation in capital circulation. While standardised measurements lay the foundation for the tradability of ecosystem services, proper markets only emerged where a regulatory framework was in place, and compensation became possible and attractive (Mazza *et al.*, 2012, p. 2).

Cities can contribute to the valuation of adaptation. Assessing the damage that could be avoided usually requires the construction of a baseline scenario without climate change (UNFCCC, 2011: 12). Precise knowledge of past extreme weather events and associated damages lay the base of this, to which cities may have privileged access through their encompassment in national and international governance systems. Cities can create reliability by standardising procedures and measurements and thus accelerate the process.

Their basic premise is that humans benefit from adaptation projects even though they are costly. Putting a price tag on a park or a levee is a way to extend and standardise that rationale. While some results encourage such endeavours, such as a recent study by Swiss Re indicating that adaptation benefits outweigh their costs by a factor of 10 (Gray et al., 2023), the nature of adaptation poses many obstacles to valuation. It raises the question of its strategic soundness. The following section will examine these pitfalls in three dimensions: lack of consistency, the nature of the good, and social justice.

Lack of Consistency

A common approach to adaptation valuation is cost-benefit analysis. There are two broad categories: (1) financial assessments, which consider only financial costs and benefits, and (2) economic assessments, which extend the analysis to "the national economy as a whole" (UNFCCC, 2011: 12). As adaptation projects usually produce benefits for many—e.g., less heat in the city centre, less exposure to flood risk—adequate analysis is achieved with economic assessments. This usually also includes costs and benefits that are hard to measure, typically those that are not traded on markets, such as human health, ecosystem services, or biodiversity (ibid.).

For ecosystem services, their difficulty in being measured arises because of their systemic character, of which only a part has benefits for humans. Whether the whole system or only the socioeconomically relevant part of it should be evaluated is a first source of uncertainty, as Boerama and colleagues explain (Boerema *et al.*, 2017). The authors review 405 peer-reviewed ecosystem service papers engaging with quantification in their study. They show that "each of the 21 [ecosystem services] had on average 24 different measures." Another problem they found is that models, maps, and remote-sensing analysis are frequently not validated with actual data, and uncertainties are often not included. Lack of consistency is not only limited to ecosystem services. Grey

adaptation that lowers climate risk can only be evaluated with a counterfactual business-as-usual scenario. This choice and specification will strongly influence the result (Leiter & Pringle, 2018). In addition, what counts as adaptation is often unclear (ibid., p. 32).

Overall, the variety of possibilities for measuring the value of adaptation leads to high inconsistency. Using it nonetheless means exposing the projects to potentially high variability in their value simply due to the choice of methods. For one, this generates a risk of misleading investors' (and planners') decisions. But it also means taking the risk of jeopardising existing adaptation infrastructure, as its value might drop unexpectedly. This risk becomes more pronounced if the adaptation goods are integrated into a market and exposed to fluctuations.

Incompatibility of the Good

Problems arise as well because of the nature of the good that adaptation produces. Unlike the metric of CO2 equivalents, which are universally applicable and have a uniform effect based on the physics of our atmosphere, adaptation is *locally bound*. Its benefits and design depend on the environment (Leiter & Pringle, 2018) and the local trajectory of climate change. However, in the local area affected by adaptation, the benefits typically have a non-exclusive character. Environmental goods have been described as common-pool goods (Lele *et al.*, 2013). If economic valuation is a step towards the tradability of adaptation, serious concerns arise from these properties that render adaptation goods non-tradable and inappropriate for cost-benefit analysis.

Ecosystem services have properties that oppose market logic. They have tipping points, meaning thresholds of pressure, after which the state of the system will be permanently altered. The extinction of species is an extreme case that affects ecosystem services (Ehrlich & Mooney, 1983). In this case, the ecosystem will never enter the previous state again. Less dramatic but possibly more important is the long recovery time of destroyed ecosystems such as forests. In carbon markets, this property renders off-setting emissions by carbon sequestration elsewhere a problematic practice (Mazza *et al.*, 2012), and similar mechanisms could come into play in adaptation. From an ethical perspective, putting a monetary value on human life is highly problematic (Christiansen *et al.*, 2018, p. 148). Finally, adaptation is a long-term good that will become more important as climate change progresses. Usually, discount rates are used to assess the benefit of infrastructure, which is particularly doubt worthy in this case (Lele et al., 2013). In sum, integrating adaptation infrastructure into markets is likely to engender serious issues of how these goods should be treated or at least ask for regulation and protection.

Social Justice

As the UNFCCC writes, it is "important for adaptation planners to not only consider the net benefits but to also consider the distribution of costs and benefits of adaptation options" (UNFCCC, 2011, p. 11). Summing up the benefits of a project in a single number does not inform about who pays the price and who gets the gain. In addition, aggregating costs and benefits across individuals—as done in economic assessments—does not account for the fact that a dollar is not the same for everyone (Lele *et al.*, 2013). The valuation of adaptation is especially prone to rendering equity concerns of adaptation invisible.

One proposed solution is to apply weights to the calculation. For instance, one could consider halving the benefits of the rich and doubling the benefits of the poor (UNFCCC, 2011, p. 11). However, the real challenge lies in the practical implementation of this approach. How do we precisely define the groups, and where do we set the thresholds? These are

open questions without a clear answer, which further contributes to the variability of adaptation valuation. Moreover, this approach fails to account for the qualitative differences in the distribution of benefits.

Climate Adaptation Finance and De-Risking

Beyond valuation, a second challenge to leverage the private sector is that, in financial terms, adaptation is 'risky.' As a relatively new investment field, there is little climate adaptation knowledge within investor circles, with few experts, rendering investment strategies more uncertain. This contrasts with mitigation projects such as renewables, where revenue models are well understood and coveted. In addition, adaptation projects commonly take ten to twenty years to implement. They are related to significant upfront investments and often a small ticket size, factors that increase their associated risks (Skeyoung Choi *et al.*, 2023).

Defining the De-Risking State

To tackle the demands for risk calculability in an uncertain context, the state can play a role in making adaptation projects both investible and profitable for the private sector through a mechanism known as 'de-risking.' De-risking is when the state modifies price signals "to mobilise private capital investment for its policy priorities" (Gabor & Braun, 2023: 10). According to Gabor & Braun (2023: 6), there are different types of de-risking states, varying on a continuum between 'weak and 'robust', depending on the targeted sectors and policy implementation strategies. On one hand, a weak de-risking state predominantly targets existing capital allocation, such as infrastructure, and tweaks the risk-return profiles of financial assets. On the other hand, a robust de-risking state goes further by tackling the organisation of production, accentuating sectors such as manufacturing. This is done by directly subsidising capital expenditure. Additionally, depending on the weight of geopolitical and fiscal figures and institutions at a national level, the type of de-risking state will vary.

States can de-risk in four ways —fiscal, monetary, regulatory, and social— while going hand in hand. Fiscal de-risking aims to implement various strategies to attract private capital via "tax credits, guarantees, carbon contracts for difference, and contingent liabilities within public-private partnerships" (PPPs) (Gabor & Braun, 2023, p. 12). Regulatory de-risking intends to dismantle barriers to new asset-class construction. Monetary de-risking, led by central banks, focuses on the settling of interest rates (notably inflation), mitigation of currency risks, and communication of policy intentions and guidance, and therefore reduces investment risk. Finally, social de-risking is more symbolic, entailing that the state ensures political and social accountability. These de-risking mechanisms can help foster private investor trust and unlock funding for climate adaptation projects.

The UK Context

In the broader climate context, de-risking is a robust tool advocated by the UK government's 2023 Green Financing Strategy and Powering Up Britain Program. Led by fiscal players, the UK represents a weaker de-risking state. However, there is little to no overview of de-risking climate adaptation. A plan is said to be established by the end of 2024, but no other steps have been taken (HM Government, 2023). The Climate Change Committee's 2023 "Investment for a well-adapted UK" points to the necessity of activating various funding sources to support adaptation investment and account for market barriers and investment shortcomings. The most significant barrier the Committee claims is monetising adaptation action benefits to repay private investment. The government has launched two initiatives to tackle it.

1. Monetising insurance benefits from flood resilience: The initiative aims to address challenges in insurance viability and affordability due to increased climate risks. It explores new financing mechanisms to facilitate insurance markets, particularly in building flood resilience, thereby reducing overall costs.

2. Coastal Loss Innovative Funding and Financing (CLIFF): a study focused on developing innovative financing methods to assist residents affected by sea level rise. This could involve incentives for relocation from high-risk areas or providing financial protection to those impacted by coastal losses.

Alongside this, the public sector is framed as the leader of adaptation investment, as it remains the key deliverer of public investments (CCC, 2023).

Limitations

There are fundamental limitations to the de-risking state based on the intricate opposing objectives of the private and the public sectors in climate adaptation investment. An oversimplified view of these objectives could be 'money' for the private side, which manifests itself through ROI, versus 'people' for the public side, which is illustrated through community resilience and election results. These different objectives translate into different visions of risk. To attract financing, the public sector is continuously reshaping policy problems in the language of the private sector, turning public goods, social infrastructure and nature into asset classes by establishing de-risking mechanisms that correspond to private capital investment inclinations (Chiapello, 2017; Gabor & Braun, 2023: 5). This continuous ambition to produce investability creates a state-capital relationship where capital leads, crystallising the state's dependence on the private sector (Gabor, 2023; Gabor & Braun, 2023). Moreover, the safety net of de-risking strategies may also disincentivise private institutions to put an effort into adaptation projects and take more risks. A second view of the difference between the sectors relates to their vision of risk: Politicians implement strategies to avoid blame to remain in power, and their long-term vision is limited by election cycles, which makes them particularly risk-averse for adaptation projects (Hood, 2010).

UK Regulations and Incentives

Given this discrepancy in public/private approaches to adaptation projects, how does the UK, particularly London, regulate and incentivise adaptation projects? This section will first cover the approaches taken in the UK to incentivise adaptation finance through Public-Private-Partnerships (PPPs), to then focus on two aspects of regulation: the possibility of a Green Taxonomy and the crucial role of London's specific position as an international financial centre.

UK Regulation Model for Adaptation Projects

Since the 1980s, adaptation projects in the UK have relied on private-public contracts, in which the public sector regulates the project's funding sources and overall quality and de-risks its investment profile. For example, the Regulated Asset Base (RAB) model allows infrastructure projects to fund their services through a surcharge on consumers' bills (Ranger & Bremner, 2023, p. 4). This provides a stable revenue model and "unlocks" private funding—often with the added benefit of the state taking on some risks associated with the project, as seen above.

However, in the case of London, the 'public' actors can be the government and municipal authorities, which have less regulatory power. For example, a significant revenue source in past projects, notably related to adapting public buildings such as hospitals, is the ability to levy taxes related to the project. Municipal actors in the UK are much more constrained in

their ability to leverage such public funding sources (Ranger & Bremner, 2023, p. 8).

A UK Green Taxonomy?

The EU set up its Green Taxonomy in 2021 after the UK had left it. Since then, discussions in the UK have been ongoing about setting up a UK-specific taxonomy so investors can knowingly invest in "green" projects and prevent greenwashing. Such a taxonomy would help tackle information asymmetry regarding adaptation projects mentioned earlier, and reorient diverse sources of financing towards more pressing projects through 'more perfect' markets.

Yet, two things should be noted about current discussions on the UK Green Taxonomy. Firstly, in its current conception, the conservative government stresses the non-binding nature of the—the Mobilising Green Investment (2023) report reads that "Government does not wish to place undue burdens onto companies' if their size makes disclosure a complex affair, and will thus initially expect voluntary reporting of the companies" actions (HM Government, 2023, p. 10). This does not inspire particular trust in the ability of the taxonomy to prevent greenwashing.Secondly, the Taxonomy primarily focuses on mitigation or net-zero strategies, potentially neglecting regulations linked to adaptation. According to the government's Green Technical Advisory Group (GTAG), charged with adapting the EU Taxonomy to the UK, public guidelines regarding "transition priorities" are not yet clear enough to evaluate the combined impacts of adaptation projects and include "transition guidelines" into the taxonomy framework (Rust & Robinson-Tillet, 2023). This points to a core obstacle in bridging the information gap regarding adaptation valuing: to standardise local projects, a national taxonomy needs to establish evaluation criteria that might not be able to encompass local specificities. It also points to a potential lack of coordination between government authorities tasked with setting adaptation/transition roadmaps, on one hand, and authorities tasked with facilitating investment into adaptation/transition projects.

Leveraging and Regulating London's Financial Markets for Adaptation

How does this national framework to regulate and incentivise adaptation projects translate in the case of London, an international financial centre? London's position as an international financial centre impacts its ability to attract financing for adaptation projects. In the last decade, private initiatives have been developed to portray London as a climate finance leader through semi-binding 'regulations.' For example, the London Stock Exchange (LSE)'s Green Economy Mark, established in 2019, identifies companies in the London & Alternative Investment Market (AIM) whose total revenues come primarily from 'green products and services.' The LSE also opened a Sustainable Bond Market, partly to attract international finance for adaptation projects (London Stock Exchange Group, 2021). Nevertheless, it must be noted that such initiatives are not binding regulations and are subject to companies' PR strategies more than their quantified impact on the environment. The correspondence between LSE companies' valuable contributions to adaptation and their marketed contributions is neither apparent nor regulated in this context. As a financial centre, London also attracts capital which is only partly captured through taxes; the City of London's ability to leverage such capital will be discussed later.

Conclusion

Regarding the valuation of adaptation, the goods local, interdependent, and distributional character raises serious questions about how monetary values could ever be adequate to guide action. Instead, it makes a depoliticised manner of disposing of things likely and might risk existing adaptation infrastructure.

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3.2 The Challenge of Capturing Financial Flow

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Much of today's debate in the realm of climate adaptation finance, including this report, seeks solutions for adaptation outside the public sector. The public sector, especially in the United Kingdom (UK) and London specifically, has lost much of its financial and judicial power and, crucially, in the public narrative. Key players in the field of adaptation, such as the World Resource Institute or the World Bank, write about "What It Takes to Attract Private Investment to Climate Adaptation" (Choi *et al.,* 2023) or "Why We Must Engage the Private Sector in Climate Change Adaptation Efforts" (Miller, 2014). The following section focuses on how and why the public sector needs to be re-empowered to address climate adaptation to deal with bankability and long-term investment issues. This section addresses the question of the role of tax abuse in the decline of the public sector and the legitimisation of the returning argument of the insufficient government budget to finance adaptation projects.

The Role of Taxes in Climate Adaptation Finance

States have several methods to finance climate adaptation projects. Among these methods are partnerships with the private sector, borrowing money/going into debt, or financing through tax revenues. As we hope to illustrate the issues of direct public financing we are interested in the latter two methods in which the state can finance projects entirely by itself. Many European states, including the UK, resemble what Wolfgang Streeck has called a "consolidation state" (Streeck, 2015), in which public debt is avoided where possible and where a cohesive turn away from Keynesian politics both in terms of political decisions and narrative spread. This is a turn away from what he called the "classical tax state," which existed in many countries after World War II. An important aspect in both states is the concept of taxes, which are often understood as the financing mechanism of states and a tool through which debt can be reduced later. For example, in the UK, "taxes made up around 42% of the £1,027 billion total current receipts in 2022/23" compared to "£1,157 billion of total managed expenditure" (HM Treasury 2024). Therefore, taxes also play a crucial role in financing climate adaptation projects both in practice and as part of the public narrative. However, the rise of tax evasion by today's largest multinational corporations leads to immense losses in state revenue. The ICIJ reports that $500 billion is lost annually due to "tax abuse" (McGoey, 2021). When we hear about the "gap in climate adaptation finance," $500 billion seems like a number to consider.

In the UK, analysis by the Tax Justice Network, based on methodology used by the United Nations, shows that 13% of the estimated total revenue is lost due to tax abuse, which corresponds to over $1 billion (Turner, 2017).

The UK government reviews the total tax gaps per fiscal year and estimates that £35.8 billion were not collected for the year 2021-2022. Moreover, 30% of the global tax gap is due to Corporate tax, and the individuals characterised as wealthy by the HMRC (or 700,000 individuals) make up for 5% of the gap, or £1.79 billion (HM Revenue & Customs, 2023). To put that in perspective, "around £5-10 billion per year will need to be invested in adapting the UK economy to the effects of climate change across both the public and private sectors," according to the Green Finance Institute (2023). This has significant implications for the ability of the state to finance climate-related projects.

Addressing the issue of tax evasion and abuse is a crucial step in creating revenue streams for states to finance climate projects. Therefore, the *status quo* has created the idea of the weak state and had real-world implications. The relationship between climate policies, projects, and tax evasion has already been raised by several scholars, such as Jessica Green, who

writes that "Corporate tax reform would not only repatriate the billions of dollars in missing capital, it would help create the political conditions for meaningful action on decarbonisation" (2021, p. 372). This is also the case for other elements of the climate crisis, as scholars have argued that "Biodiversity targets will not be met without debt and tax justice" (Dempsey *et al.,* 2022), and for other regions outside of Europe, especially where tax evasions happen at an even higher rate such as sub-Saharan Africa (Nsenduluka & Etter-Phoya, 2023). More than merely tackling the tax gap, fighting against carbon leakage and environmental dumping, which prevent national financial resources from being directed towards economic activities contributing to the mitigation and adaptation effort that have global impacts, is primordial. For example, Tax Justice UK has developed a precise plan of reforms of the tax system to support a green and fair transition. This implies the alignment of taxes and disincentivizing behaviours with negative environmental impact while using tax reliefs, rebates, or other types of funding to incentivise green alternatives. A focus is also put forward on mechanisms that should be put into place to compensate low-income groups, following a systematic evaluation of the impact of tax reforms on those groups. Another measure, although obvious, that should be considered is removing carbon and fossil fuels subsidies, which represent a tax loophole of £4.4 billion per year. In addition, closing some tax loopholes, like the "Business Asset Disposal Relief" or inheritance ones, could bring respectively up to £1.1 billion and £1.7 billion per year to the government (Tax Justice UK, 2023).

However, there are reasons to look at London more specifically in this context, not only because of its role as a global hub for tax avoidance schemes but also because of its local climate adaptation efforts: what and whom do they protect, and who pays for it? What makes London unique in this regard?

The City of London

Although we did not have a chance to visit it during our trip, the City of London is one of the key players in the global offshore market. It is essential to point out the difference between London as a city and the City of London, which is both its own city and local government district with its own mayor, institutions, and police. However, as a financial hub, it also plays a larger role in global markets, described by scholar Matthew Eagleton-Pierce as follows:

> *"The City is, of course, under the sovereign authority of the UK state and yet, by virtue of its capacity to carve out 'juridical enclaves' [...] and host transnational capital, operates in a socio-economic space which is often far removed from the British economy. Thus, the City exists in both an 'onshore' and 'offshore' sense: the principle of territorial organisation is not replaced, but it overlaid with a 'nonterritorial social space' of material flows and identities" (Eagleton-Pierce, 2022, p. 188).*

He further elaborates that the governing body, the City of London Corporation (CoLC), is relatively understudied and we know "comparatively little" about it (*Ibid*). It owns hundreds of millions worth of real estate in London. It is "involved in the reproduction of a wide range of social relations" (ibid., pp. 190-192). Its secrecy and limited availability of scholarly research make it difficult to assess the role of the CoLC. However, it has related to tax evasion at a global scale by authors such as Nicholas Shaxson in academic articles, books, and newspaper articles (Shaxson, 2011; Christensen *et al*., 2016; Shaxson, 2018). So, what exactly is the role of the CoLC in climate adaptation finance?

Although any definitive assertions are thus impossible to draw in this report, it is essential to direct attention to these critical players in London's financial sector at the core of climate adaptation finance. Only further research and

more transparency can help us fully understand the CoLC's role in tax evasion and tax abuse schemes globally and locally. Moreover, we need to ask how much responsibility lies with such an institution that is geographically and legally at the core of London and its financial hub status in terms of adaptation. A part of this question is also the legal structure of the CoLC itself, where currently, "the business vote now actually outnumbers the residential vote in the City" (Erturk 2011, 20 *as cited in* Morgan and Kinossian 2024, 171) and the police, which is involved in any tax investigations to some degree, is funded partially through private companies (City of London Police 2024). Conflicts of interest need to be investigated further to get a better understanding of what exactly these political structures mean for compliance in the CoLC.

If the CoLC benefits from special legal status and owns real estate outside of its jurisdiction borders inside of London, there should be transparency about its status for scholars working on climate finance. If it enables tax abuse in any form, should it be held accountable more directly in financing adaptation efforts? Either way, given its location in the centre of London, right next to the Thames, it is clear that this piece of land needs significant protection and adaptation for future events caused by climate change.

Globally, the role of London should also not be underestimated as it is where much of the legal regulation for closing offshore loopholes would need to happen. All of the top three global tax havens, according to the Tax Justice Network, the British Virgin Islands, Bermuda, and the Cayman Islands, are officially British territory (2019). However, these tax havens do not exist in a vacuum and are under British regulation to a certain extent. The advocacy organisation Tax Justice UK argues, "International tax avoidance in places like the British Virgin Islands is being enabled by the British government's failure to act" (2024). The CoLC plays a crucial role in this network, and it is described as follows: "The City of London's offshore network consists of three main layers. Two inner rings in the form of Britain's Crown Dependencies and its Overseas Territories are largely controlled by Britain and are said to combine 'futuristic offshore finance with mediaeval politics' (Shaxson 2011, p. 15). The outer ring is a more diverse array of havens that used to include Hong Kong, all outside Britain's direct control but with strong historical links to the country and the City" (Morgan & Kinossian, 2024). The political role of the UK, London, and the CoLC cannot be ignored in the global tax haven network nor regarding the climate adaptation finance gap.

Conclusion

This section has addressed the role of tax abuse in global and local climate adaptation. In line with several academics who have published on this topic, we have argued that tax justice cannot be ignored when discussing climate adaptation finance. London plays a crucial role in the global tax abuse network because the CoLC, at its core, has an intransparent political structure. It is described in several articles, books, and newspapers as a hub for offshore tax havens. The numbers mentioned in reports on tax avoidance globally are immense and could play a crucial role in filling the adaptation investment gap. Locally, the City of London should be investigated further to understand its responsibility in financing adaptation projects. It also raises questions about who owns the infrastructure protected by climate adaptation, who benefits from further adaptation, and how much of the costs they (should) cover.

More broadly, tax abuse also influences the general narrative about climate adaptation finance in London and the world and how "bankable" a project needs to be for it to be realised. Many critics argue that there are aspects of climate change adaptation that the

private sector cannot or should not address. With an additional £1 billion per year, there are undoubtedly many additional projects the government could realise without relying on the privatisation of essential infrastructure. This piece aims to shed light on the substantial resources that could emerge from ambitious anti-tax evasion policies, a crucial issue in the UK and other countries worldwide. Of course, a key question remains: how to ensure those funds are allocated to financing a just and inclusive climate adaptation? While this question is essential and should not be eluded, it is crucial to recognise that money in the hands of a public and democratic body is subject to democratic processes, responding to popular will and public interest, in contrast with the current situation where those resources are enriching a selected few. We need to ask who pays for climate adaptation and who benefits from it, primarily who benefits from the idea that the state (or the actual taxpayers) cannot afford it.

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Rough sleeping in London. Source: The Guardian, 2024. © Andy Hall/The Observer.

3.3 The Financial Re-Empowerment of the Public Sector

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Our trip in London has raised a lot of questions regarding the state of the current government's finances in the UK and more generally in Europe. Indeed, the idea that private money should bridge the climate finance gap was the dominant paradigm reflected in all our discussions. However, financing public goods and services, of which climate mitigation and adaptation projects, with private money raises serious democratic and ethical challenges about the commodification of social welfare (Chiapello & Knoll, 2020, p. 12). Digging deeper in the literature led us to question further this "weak state" narrative which often underlies discourses in favour of leveraging private money. Can this narrative be reduced to a matter of 'financial weaknesses', i.e., a lack of public funding which would require tapping in private money? Or does it in fact refer to a weakening of the idea of a welfare state itself? Examining these tensions, we argue that discourses of private financing of adaptation are part of a historical shift in welfare politics and a drift away towards the commodification of public services. Taken up by the media and political parties in the UK, this liberal approach to ecological transition has become prominent. Yet, the argument for a public-led transition cannot be reduced to a principled public vs. private dichotomy. Democratising adaptation by promoting cooperatives and co-responsibility as well as transparent processes – which can involve forms of private activities – is also crucial to avoid detrimental financialisation of climate responses.

The Financialisation of Welfare Politics

The offsetting of social welfare programs from the public onto the private sector has a long history in the UK. Thatcherism is commonly used as a reference point to highlight this historical shift. Since then, the UK state has aimed at a "public debt-to-GDP ratio below 40%," an enduring rationale which still supports the logic of financing public goods and services through private money (Findeisen, 2024). The privatisation of the UK environmental sector is a case in point. In response to the important investments required by European regulations, the government led by Margaret Thatcher issued the Water Industry Act (1989) which completely privatised the system of water provision in the UK.

Since the 2008 subprime crisis, the boundaries between what constitutes 'public' and 'private' activities have become even more blurred. While the major economic backlashes engendered by the crisis have highlighted the disastrous impacts of financialised capitalism, 2008 is also paradoxically seen as a turning point for a new form of capitalist logic: Social Finance and Impact Investing (Chiapello, 2023). Social finance has been promoted with enthusiasm by the UK government since the creation of a "Social Investment Taskforce" in the 2000s (Dowling, 2017 p. 296). London had pre-eminent standing in this novel framework by being promoted as the "leading global hub connecting social enterprise to capital markets." This enthusiasm translated into new regulations and legislation to facilitate the lure of 'social-oriented' forms of finance of which the Localism Act is a good example. The latter was passed in 2011 and gives the power to municipal councils to "bid for and run welfare services" (Dowling, 2017, p. 297).

In the framework of social finance and impact investing, the purposes and logics of the private and public sectors are no longer contradictory but complementary. Within the social finance paradigm, the vast ocean of private capital can and should be redirected towards "socially good" projects through "impact-driven investments" (Chiapello, 2023, p. 3). This new approach redefines the public/private dichotomy as a relation of 'co-production' able to provide for social welfare while raising benefits for private investors. This leads to the emergence of notions such as social return on investment (SROI). Hence, the

financialisation of the public sector refers to both a set of new financial instruments—giving more agency for financial actors to shape the direction of policies—as well as the adoption of "the language" of finance applied to governance and policy making (Chiapello, 2017, p. 8).

In practice, mainstreaming the social impact finance paradigm in world organisations such as the G8, the OECD, or even the European Union, have led to the creation of several financial instruments blending public and private assets and actors. Ève Chiapello highlights four: blended finance; social impact bonds; venture philanthropies; and impact investing. All these tools are structured around the notion of 'impact', i.e., the ability to measure and quantify the capacity of a given investment to achieve its intended 'positive social effects.' These tools thus considerably complexify the structure of financing and funding by bringing together new actors to the table, e.g., "evaluators, consultants, asset managers […]" (Chiapello, 2023, p. 1). The utilisation of blended finance mechanisms and social impact bonds has serious implications on how social welfare policies are framed as well as the ability of the government to effectively address 'public issues.'

While depicted as able to address more systematically, widely, and effectively problems, blended finance mechanisms such as social impact bonds (SIBs) are quite limited in their "impacts" (Chiapello, 2023). The need for private investors to generate profit reduces the scope of possible actions while redirecting public resources and effort towards ensuring the 'bankability' of projects (Chiapello & Knoll, 2020, p. 17). Besides, SIBs have been pointed out as favouring larger providers. This disadvantages more 'grassroots' organisations which, despite their more limited funding, might have a better understanding of the 'on-the-ground' realities (Dowling, 2017, p. 297).

SIBs and other forms of blended finance effectively blur the distinction between financing and funding. Leveraging private finance for public infrastructure projects or service provision comes with an additional cost for the public sector, which must fund back the initial investment with interest rates, through for instance, bond returns (Dowling, 2017, p. 302). Blended finance appears to bridge the fundamental contradiction between the public good and private interests. In fact, it contributes to re-inserting social welfare within the market logic of risk, investment, and returns while developing new streams for public money to be captured by private capital (Dowling, 2017). Additionally, to make investing in social services and infrastructure 'profitable' from an economic perspective, public actors have also set up fiscal incentives such as tax reductions which further weakens state redistributive capacities. The UK government has, for instance, put in place "up to 30 % income tax relief for investors'' to incentivise investments (Dowling, 2017, p. 297). Blended finance thus illustrates a shift in the conception of 'public governance' according to which money "needs to be taken where it is located, i.e., in the private sector", rather than through taxation and redistribution (Thyrard *et al*., 2021, p. 9).

The financialisation of social welfare activities is thus not only restricted to shifting the source of financing from public to private but in fact reflects a deeper ideological transformation of democratic governance. The notion of 'impact' is particularly indicative of that shift. Indeed, impact measurement limits the provision of social welfare services and goods by reducing it to a performative act, required to yield results and positive 'return on investment' (Chiapello, 2023). The Orpea scandal in France shows the detrimental effects that this logic of cost efficiency and competition can have on the quality of welfare practices and services provided. Orpea—now called Emeis—is a private company in charge of managing

retirement homes across different European countries. As a provider of health care services, it received "more than 360 million euros public funding per year" (Gérard & Lemaire, 2023, p. 31). In 2022, the journalist Victor Castanet revealed the violent treatment that had been imposed on Orpea residents, e.g., meal rationing, to reduce costs. In this case, prioritising cost-effectiveness led to the depersonalisation of human beings to "standardised categories" and quantified and optimised 'care' (Gérard & Lemaire, 2023, p. 25). According to Gérard and Lemaire, the Orpea scandal is illustrative of how the rationale of economic efficiency and accounting have become "obvious means of distributing [scarce] resources" (Gérard & Lemaire, 2023, p. 25). The development of social finance and impact investment is not exempt. Overall, coupling the logic of social impact with that of optimisation ends up being detrimental to working conditions as well to wage-cuts and the opportunistic reliance on volunteering. This raises the question of "who actually bears the cost of cost-savings" (Dowling, 2017, p. 301).

Emma Dowling, in her analysis of SIBs in the UK, shows how measures of impact end up putting a price on welfare. Social impact bonds work according to a 'payment-by-result' mechanism which implies that the rate of public funding depends on the performance and the outcomes achieved by the private contractor. Impacts are categorised in different sets of 'outcomes', e.g., the targeted individuals are back on the job market or have entered university (Dowling, 2017, p. 298). The level of repayment by the public entity to the private contractor depends on the kind of 'outcome' achieved. This categorisation—without which private contractors would not be able to compare 'the potential interests' to be gained out of their investment—also reflects a certain understanding of what welfare politics should aim for. Indeed, measuring impact in terms of an individual's ability to become a "productive" agent who is "non-dependent" is entrenched in the logic of the over-responsibilisation of the individual (Dowling, 2017, p. 298). As a matter of fact, Dowling also states that an overwhelming majority of projects "are about intervening in society [...] to reduce the very need for welfare entitlements or health and social services" thus suggesting that the reliance on welfare is itself a "problem" (Dowling, 2017, p. 299). This shows that beyond the detrimental effects of impact measurement, social finance changes reflect a deeper ideological change in which self-sufficiency and productivity are promoted over forms of solidarity. Social welfare questions are no longer discussed as political questions, requiring arbitration between competing interests, but as 'investment dilemmas' (Chiapello, 2017, p.8).

Unpacking the Dominance of the Capital-led Transition in the British Public Debate

Reliance on the private sector is regularly framed as the only, inevitable option to close the adaptation gap. Climate politics is no different. This is particularly true in the United Kingdom, where several signs point to an intensification of this deep-rooted trend. YouGov's January 2024 poll for The Times shows a majority of British adults now consider that "keeping down the amount of money the Government borrows" should be prioritised over "reducing carbon emissions," "even if that means taking less action" to combat climate change. Another bi-monthly YouGov opinion tracker shows that a declining share of British voters believe the Conservative government should do more to reduce carbon emissions. This decreasing support for public investments in climate policies, which goes against the grain of most European and Western countries, cannot be explained by a decline in environmental awareness. There is broad agreement on the anthropogenic nature of climate change and most British voters now

approve of the necessity to increase efforts to reduce emissions: it appears to be more of a rejection of a public sector-led ecological transition (Langengen *et al*., 2024).

Political organisations appear to follow, if not to fuel this underlying trend. As of 2024, all the prominent political parties and organisations of the United Kingdom support a capital-led ecological transition. Even the traditionally centre-left Labour Party recently imposed austerity on its climate plan after a decade of strengthening its environmental manifesto. In fact, last February, Labour doubled down by scrapping its most ambitious green investment plan (£28 billion a year in green energy) from its electoral manifesto, citing funding issues (Cooper, 2024). Similarly, the left-of-centre Scottish government recently broke apart after the dominant Scottish National Party unilaterally announced another disengagement of governmental actors from climate policies. The latest surveys suggest this decision had little impact on the party's electoral potential (Grant, 2024).

It is challenging to ascertain the cause of the apparent consensus for capital-led options in British civil and political societies. In the academic sphere, a significant portion of studies published over the past few years by British economists and climate scientists opposed such a state disinvestment. Last January, for instance, a working group of leading experts at the University of Cambridge and the London School of Economics and Political Science published a joint report warning that "current plans to cut public investment over the next few years will likely mean a continuation of stagnant productivity and weak economic growth." The report, endorsed by the two faculties, estimates the United Kingdom needs a 1% GDP increase in annual public investment to tackle climate change (Stern *et al.,* 2024). No party present in the British parliament advocates for such a significant increase.

On the other hand, British mass media tends to expand their environmental engagement. A Carbon Brief study (Gabbatiss *et al*., 2023) reported not only a growing coverage but also a growing favourability to climate politics in British newspapers. In 2011, only 22 editorials called for more radical climate policies; ten years later, in 2021, 163 editorials were published—despite an intensification of government efforts to tackle climate change throughout the decade. On the contrary, the number of editorials calling for opposite solutions remained at similar levels during this period (between 5 and 10 every year). Additionally, the media's inclination to cover more radical climate policies is widespread throughout the United Kingdom's political spectrum. The share of right-leaning newspaper editorials expressing favourable views on climate policies rocketed from 15% in 2011 to 80% in 2021.

A key explanation for this development can be found in the British media companies' economic model. These companies are almost all privately-owned and all pursue profitability objectives yet benefit from little public funding. Ensuring readers' loyalty and consistent sales is, therefore, a key aspect of editorial teams' activities. Consequently, these newspapers tend to carefully study and align with readers' views—which have become increasingly environmentally conscious over the past few years (Conboy, 2020). This influence, however, is reciprocal. The media are the British people's main source of education on climate issues; the approaches they adopt play a key role in the outlook of their readers and their relatives. Right-wing "new media", for instance, have first considered scepticism towards green policies as a buoyant subject to expand their readership, yet they ultimately played a great role in reinforcing their new readers' climate scepticism (Ruiu, Ruiu & Regnedda, 2023). Therefore, most British mass media have become the relays and, ultimately,

the active supporters of the generalisation of support for climate policy among British voters.

That being said, most British mass media adopt a perspective favourable to economically liberal climate policies; private finance is generally described as more flexible, having more expertise than public actors, and more stable due to its independence from electoral developments. These speeches play a strong role in educating readers in favour of essentially liberal responses to the environmental crisis (Storksdieck & Stylinski, 2010).

Additionally, a very large majority of British voters believe that it is impossible to complete the ecological transition without reducing the middle and working classes' living standards. However, the United Kingdom is currently hit by an economic and energy crisis that has greatly impacted its citizens' living conditions over the past few years. Opinion polls show that this crisis is driving voters to support a reduction in non-sectoral public spending and a limitation of public debt (Smith, 2022), which is the formal reason why liberal and social-liberal parties have cut their projected environmental transition spending recently. We believe this crisis has led voters and parties to support the greater transfer of green policies to private actors—not due to a proper conviction of private companies' greater capacity to handle environmental policies but to protect citizens' living standards in an era of economic crisis.

In a context of eroding voter support for public environmental policies in the UK, it is essential for public authorities to take compensatory actions to forcefully increase the private-sector involvement in driving the ecological transition. We have seen the significant incentive powers on ecological matters granted to British local bodies such as the London Assembly: in the wake of the recent local elections, which gave them renewed democratic legitimacy, it seems important that these bodies commit to stronger policies for the months to come.

Adaptation, Private Finance, and Democracy: A Durkheimian Critique

As we have said, few global projections today rule out the use of private funds in adapting to climate change. There are two main reasons for this, the reality of which is borne out year after year: (1) the funds invested in adapting to climate change—the majority of which are public—are largely insufficient at present (almost 10 times less than the investments required), (2) the dramatic consequences of climate disruption are becoming more acute by the day, and require political responses.

As a result, the strategy of international organisations such as the UNEP today is more a matter of budgetary "all-in" or general mobilisation, than of deep economic conviction in the ability of the private sector to fill this gap, or of any faith in the free market. It is important to situate this debate in space because the resources of the world's States are incomparable (the taxation capacities of the Member States of the European Union being largely greater than the majority of countries in the world). Reports such as the UNEP (entitled "Underfinanced, Underprepared") clearly indicate the need to resort to all possible forms of financing.

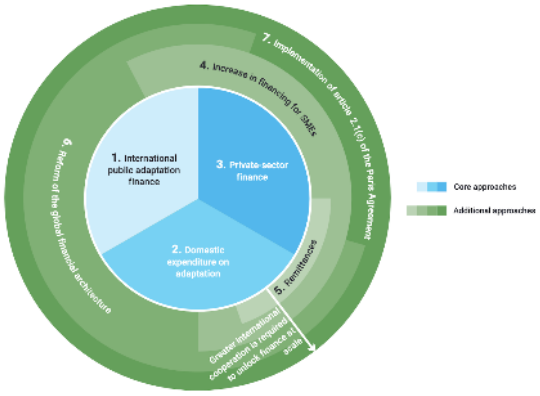

Figure 34. Funding sources for adaptation worldwide. Source: UNEP, 2024.

These funding sources aiming at states with widely varying budget structures, clearly imply (1) the use of international sources of public finance, (2) the recourse to public spending (domestic expenditure), and (3) the recourse to private finance. It is therefore not true to say that private finance is the only source to which such organisations have recourse to bridge the adaptation gap. On the other hand, the importance of the private sector is particularly emphasised for least developed countries, and for countries whose budgetary capacities promised by taxes are extremely limited.

Our current debates on the importance of the private sector should therefore be seen in the European context of the historically strong capacity of governments to intervene in the market. We have shown in previous chapters that the recent recourse to the private sector was not only the result of the liberalisation begun in the 1980s, which progressively weakened the public sector in relation to the private sector, but also the result of a gradual evolution in attitudes and in the perception of the State's capacity to act on the markets. However, in view of the economic, political and legal power that European states are still capable of wielding today—the importance of which was illustrated, for example, by the Covid-19 stimulus packages or the Green Deal—it is important to ask how recourse to private finance for adaptation to climate change could pose a problem and what political alternatives could be revived for the purpose of adaptation.

Criticisms of the Use of Private Finance

The use of private finance also has many shortcomings, four of which I propose to examine. The first is a criticism of efficiency which fundamentally questions the ability of the private sector to tackle the problem of adaptation head on. Indeed, as described by the European Investment Bank (EIB, 2021) in its report on the investment gap, there are serious 'market failures' (p.3) in this area. This criticism is not new, and has long been levelled at measures to combat climate change in general—the rise in CO2 having long been considered, by the neo-liberals themselves, to be the greatest "market failure" ever produced (Benjamin, 2009). Adaptation does not necessarily generate returns on investment, for one good and simple reason: it protects against future costs of a probabilistic nature, since they have not yet occurred. Other conditions for an efficient market, such as perfect information, are far from being met in the case of adaptation (EIB, 2021). Adaptation measures are based on major uncertainties: it is very difficult to predict the exact impact of global warming on specific locations, which limits our knowledge of the exact costs—and future benefits—of infrastructure. This uncertainty limits the advent of an efficient market, which would encourage investors to mobilise their resources in adaptation infrastructures. Public intervention has the advantage of removing this practical thorn in the side of adaptation, because the state can invest at a loss in the equipment needed for adaptation. As Milton Friedman said, "the social responsibility of business is to increase its profits" (Friedman, 1970). Hence, relying on private resources to invest in adaptation seems a risky gamble in the time available.

The second empirical criticism, analyses the current state of private funding for adaptation measures. The money currently invested in adaptation around the world is almost ten times lower than necessary (UNEP, 2023) and it is largely provided by public authorities (CPI, 2023). Indeed, while private finance is increasing its investment in mitigation measures every year, it is struggling to do the same for adaptation, among other things for the reasons given above.

The third criticism, which immediately follows from the first, is of an ethical nature. If we recognise certain adaptation infrastructures as "public goods"—which justifies the State

taking responsibility for them—it is legitimate to question the extent to which attributing a market value to them is considered acceptable. In effect, this amounts to accepting that these investments can then benefit the individual enrichment of a few shareholders, through the annual payment of dividends. For example, the fact that work to adapt water distribution systems in England will ultimately benefit a handful of shareholders raises questions about the value attributed to access to water in the country, and to its sacralisation as a fundamental right. It may be difficult to accept that the ecosystem services provided by nature-based solutions (such as planting trees in towns) can be the property of some and generate income for a few shareholders.

A fourth criticism is of a democratic and socio-economic nature. Adaptation measures are not neutral: in urban environments, they very often require arbitration over space, in areas where competition for land can be very high. This type of arbitration is likely to give rise to political conflicts between social groups with divergent interests, and may even reinforce the socio-economic, gender and racial inequalities that already exist (within cities, but also between areas, since some urban poles capture far more resources than others) (Rice, 2020). As J. Green puts it so well: "Politics is about winners and losers. Climate politics is no different" (Green, 2024). Consequently, making the development of adaptation infrastructures conditional on their ability to attract private funding leads to shifting decision-making power into the hands of the market and its interests. This might end up in decisions that do not reflect the democratic and humanist adage that each person, each life, is worth a vote and a voice that counts as much as the others.

A New Problem? Reviving Critiques from Early Socialisms

Regarding this last argument, Durkheim's definition of the first socialisms, more than a century ago, takes on its full meaning in the context of adapting to climate change: "socialism is any doctrine which calls for the attachment of all economic functions, or of certain of them which are at present diffuse, to the directing and conscious centres of society" (Birnbaum, 1984). This definition of socialism —the political thought being hegemonic on the left at the time, as communist parties did not yet exist—poses the problem of the "social question" in terms that are not strictly economic, as the Marxist tradition would have done it. For Durkheim, the problem posed by the existence of "autonomous" economic forces was not only that they deprived workers of the means of production and produced gigantic inequalities, but also that they deprived society (one might say, democracy) of the ability to steer its productive apparatus, which was captured by private interests and their own logic. Today, it is hard not to agree with this criticism, given the inexorable rise in private investment in fossil fuels around the world, or the incredible lack of investment in adapting to climate change, which threatens millions of people around the world, despite widespread public support in Europe for climate action in general.

Durkheim's point is that the problem is not just one of private versus public, market versus state, but also of the lack of democratic control over the production apparatus: in this respect, the fact, for example, that the world's largest oil companies (Saudi Aramco, Sinopec) are now state-owned, or that states have been condemned for failing to act on climate change, underlines the relevance of this criticism. Later, K. Polanyi spoke of the embedding of the economy in society, to describe the political capacity of certain societies to include and control the operation

of their economic system. He described the advent of a form of capitalism that was 'disembedded' in society in the twentieth century, with its own logic of accumulation. According to him, in his famous The Great Transformation (Polanyi, 1944), the disembeddedness of economy from society led to the uprise of the far-right in the 30s, and the European tragedy of the wars in the twentieth century.

It seems that these criticisms take on their full force in the context of adaptation to climate change, which clearly contrasts the two logics: on the one hand, that of private interests, with their logic of accumulating returns on investment, who are therefore rationally reluctant to invest in adaptation, and on the other, that of public interests, which have partially lost control of their productive apparatus, and therefore of their capacity to adapt to future climate shocks. This results in a steady annual growth in private investments in fossil fuels, and insufficient private and public action regarding climate change (mitigation and adaptation). Emphasising the importance of democratising adaptation processes is more fertile than a principled—and sometimes sterile—opposition between the private and public sectors. In fact, democratic, decentralised private forms of organisation such as cooperatives, small associations, or simply small property owners (in 2009, 69% of Europeans were property owners) must also play a driving role in adaptation by responding locally to the needs of communities, using their local knowledge. Neither strict State dirigisme nor the drive for accumulation by big business are likely to be able to meet the colossal challenges of local adaptation on their own. Moreover, democratising the production apparatus does not necessarily come with public appropriation. It requires changing the decision-making process in companies—today captured mainly by stakeholders—by empowering workers and civil society into administration councils of enterprises. Ways of conducting such democratisation were recently emphasised by scholars like Ferreras or Gombert (Leclerc, 2023; Gombert, 2024).

In conclusion, the problems posed by adaptation to climate change and recourse to private finance are not new and resonate with texts that are over a hundred years old that are critical of the capitalist economic system that followed the industrial revolution. Today, despite widespread popular support for the fight against climate change, backlash against climate policies is happening across Europe. When the authoritarian temptations of the far right are gaining ground with every election, it is crucial to reaffirm the importance of democratising the processes of socio-ecological transformation. The providential recourse to private finance does not make this possible. In short, complementing adaptation strategies with a democratic horizon makes it possible to overcome the inefficiencies, potential injustices, and arbitrariness of market solutions. It offers the fight against climate change an emancipatory social horizon, which it crucially needs to create the coalition of majoritarian interest likely to ensure the triumph of its political project.

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London climate change march during COP21. Source: BBC, 2015.

3.4 Integrating Social Justice in Climate Adaptation: A Multi-stakeholder Governance Approach to Address Climate Risks in London

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Drawing interpretations from the primary and secondary data collected on London's Climate Adaptation strategy, we will argue that multi-level governance, understood as "the interaction between layers of government, each responsible for a given territory within a hierarchy of nested units" (Faludi, 2012) is key to finance London's adaptation to the three main climate risks it faces: surface water flooding, drought, and overheating. (Howard Boyd, Leigh & Sutton, 2024). Making a case for translocal cooperation or transnational municipalism as useful concepts to unlock public finance for urban adaptation projects, we will explore the expected induced benefits in terms of expenditure accountability and the associated thorough integration of social justice concerns in climate adaptation strategies.

A Hybrid Strategy for Scaling Up Project Financing

> *"As the capital grows, it goes through waves of rebuilding, each purporting to address a dominant issue. In the late 19th century it was slum clearance; after the second world war it was the rebuilding of a city devastated by bombing as a physical expression of a new welfare state; in the 1980s the rebuilding was an effort to revitalise the city as a global financial centre. And now—what exactly? The chief function of London today, it would seem, is to convert space into money. [...] What, we might wonder, will be the public benefits of the huge new layers of 21st-century construction? Where is the vision for a grand new public infrastructure following in the wake of Crossrail? Times have changed. The sites that now appear as gaping wounds will be stitched not with public space or buildings but with vehicles for private profit" (Heathcote E., 2016).*

The Thames Tideway Tunnel (TTT) is a colossal infrastructure project, ostensibly conceived to address the strain on London's Victorian-era sewerage system, originally designed by Joseph Bazalgette. However, beneath its surface lies a complex interplay of financialisation, contrasting modes of urban integration, and socio-ecological concerns that raise questions about its true purpose and effectiveness. While officially addressing pollution in the River Thames, the TTT falls short in genuinely integrating socio-ecological considerations.

Loftus and March (2019) put at the heart of the debate surrounding the Thames Tideway Tunnel the clash between Mode 1 and Mode 2 Urban Integration (UI) as a conceptual tool to frame political decisions and implementation paths (Macrorie & Marvin, 2016). These two modes are to be understood as the chronological evolution of the other: each is presented as a distinct approach to their time. This sequential dichotomy is not yet robust and can be helpful when utilised as a critique of the actuality of top-down techno-fixes. Mode 1, epitomised by top-down, infrastructure-heavy approaches, aligns with the TTT's narrative, historically rooted in the Victorian legacy of Bazalgette's engineering marvels (Halliday, 2013). Conversely, Mode 2 UI, characterised by integrated, demand-side solutions, finds expression in alternatives to the TTT, such as the Beckton plant. As the first major desalination plant constructed in the UK in 2008, it serves as a sustainable solution by utilising residual fats, oils, and greases for energy, providing clean drinking water from waste sources (BBC, 2007). It represents a practical application of the Mode 2 UI program, given the fact that the Water-Energy-Food nexus was elevated to a priority by Thames Water in infrastructures different in nature to cooperate through a "new vision of smart utility" (Loftus & March, 2019).

The guiding moving principle behind Mode 2 UI's focus on shared institutional objectives should be this "nexus" concept, emphasising the internalisation of environmental

externalities and an overall aim at creating integrated policies and management solutions that prioritise efficiency, collaboration, and sustainable development (Macrorie & Marvin, 2016). Such an approach has gained traction, but its efficacy is questioned under the influence of financialisation.

Financialisation emerges as a central theme shaping the narrative behind TTT. Investors are interested and attracted by large-scale infrastructure projects like the TTT for they can prioritise financial gains. They expect to profit from customers' engagement to pay water bills over time. This long-term revenue stream allows them to reinvest on the financial market and accumulate capital. Despite support for smarter, integrated alternatives, financial interests overshadow calls for efficiency and ecological imperatives, reinforcing the dominance of Mode 1 UI.

The financialisation of infrastructure, particularly water services, further complicates the TTT discourse, as financial products and investment vehicles tied to water infrastructure create incentives for large-scale projects like the TTT despite more integrated and cost-effective alternatives. The involvement of private entities, exemplified by the creation of Bazalgette Tunnel LTD, underscores the profit-driven nature of such ventures, with customer payments ultimately footing the bill, often irrespective of proximity to the project's purported benefits. Heathcote (2016) summarises the aforementioned plight: "*The £4.2 billion project is being developed by a consortium of private investors, a vehicle for guaranteeing future income from London water bills.*"

Allen and Pryke (2013) frame TTT as a specific example of financialisation as the securitisation of revenue streams, involving packaging and selling future cash flows generated from household water bills as tradable financial products. In the case of Thames Water, this process allowed the company to transfer existing debt into a securitised structure and issue new debt, simplifying its capital scheme. By doing this, financial intermediaries can create investment opportunities based on the anticipated ability of customers to pay their water bills over time, turning these revenue streams into assets that can be traded and leveraged in the financial market.

Despite mounting criticism, the TTT persists as a symbol of elite interests entwined with the city's hydrosocial cycle (Allen & Pryke, 2013; Loftus & March, 2016). In contrast to a forward-looking vision of integration, the TTT embodies an archaic approach, focused more on rent extraction than genuine environmental stewardship or urban innovation.

Uncovering Climate Adaptation's Blind Spot: Advocating for a Holistic and Socially Just Planning Approach in London

As stated previously, the need for regulation and standardisation of climate adaptation valuation is crucial and has the potential to counteract unregulated market-induced inequalities of climate risk exposure. Since adaptation to climate risks is predominantly framed as necessary for "enhancing the safety and attractiveness of investment in the UK" (Giles, 2024), social justice has unsurprisingly not been consistently, nor effectively, on top of London's climate adaptation agenda. Indeed, a review of studies conducted in the UK on Social Justice and Climate adaptation finds that

> *"both autonomous and planned adaptation may fail to protect the most vulnerable individuals and groups, and may even reinforce existing patterns of vulnerability in some cases, i.e., maladaptation, especially where they rely on unmediated market forces" (Benzie, 2014).*

Climate vulnerability is hereafter intended as "a function of exposure to climate impacts, sensitivity to those impacts, and the adaptive

capacity of the people or systems impacted" (Blaikie *et al.*, 1994). Coming back to the question of unmediated market forces, we can affirm its relevance for the UK context in light of the previously mentioned deregulation and inherent weakness of the public sector, privatisation, and financialisation of environmental policies and governance. On these governing imperatives builds the difficulty of measuring "the societal and external benefits of climate adaptation, as they often do not translate into financial return" (*1.2 Financing Adaptation*), which overall makes a favourable ground for this stake to be the last priority of a municipality that is already struggling to attract the compensatory private funding for its adaptation strategy.

Furthermore, redistribution between and within cities is not systematically possible by such private-dominant approaches, as private sector dominance tends to harm marginalised groups. The relative lack of critical literature on climate adaptation and social justice in the specific case of London raises questions knowing that these effects are acknowledged as recurrent in Global North Cities. Whilst it has been stated that adaptation in London is not yet a matter of life and death but protection of assets and property, the issue takes on a more dramatic turn knowing that "deaths in London start to increase when the two-day average maximum temperature exceeds 24.8°C.", according to the Journal of Epidemiology and Community Health (Newham Council, 2023). Furthermore, the acute unpredictability of extreme events linked to climate change in London also plays in the disfavour of equity in adaptation, knowing that "large uncertainties about the direction and pace of future socioeconomic and climatic trends and events [...] make it difficult to say with certainty which groups or individuals are most vulnerable" (Benzie, 2014).

Public Participation, a Prerequisite for Social Justice?

Climate change adaptation, to be effective, needs to be democratic (King, 2023) and participatory in order to be socially just: special needs and vulnerabilities are hardly holistically acknowledged by planners on their own, knowing that they have a lower likelihood of experiencing vulnerable social positions and that "measures taken solely by local governments in public space might not be sufficient for the expected climatic changes and related impacts" (Uittenbroek *et al.*, 2019). Indeed, literature suggests that "climate change adaptation would benefit from public participation by citizens in the different stages of the adaptation planning process, from policy making to implementation and maintenance" (Mees *et al.*, 2012 in Uittenbroek *et al.*, 2019). Adopting this framework "also legitimises the selected measure" (Runhaar *et al.,* 2003) and ensures that local expertise on the impacts and uses of public space gets considered in all phases, which is crucial for maintenance in a long-term view. Finally, the pitfall of maladaptation, a crucial social justice stake, can be avoided through participation (Uittenbroek *et al.*, 2019). The stage of policy mainstreaming in which public participation intervenes is a crucial indicator of social justice. In the case of the Thames Tideway Tunnel, it was late in the process: river reconnection activities were envisioned as workshops for the "social impact," and public support and consultation were viewed as a means to ensure funding streams flow by providing a trust-worthy image to funders (Loftus & March 2019).

Multi-Level Climate Governance and Social Justice in London

Social justice is historically the dead angle of the metropolitan-wide adaptation strategies that emphasise privately funded significant infrastructure in London. At a smaller scale governance level, though, strong statements

that address "the unequal impacts of the climate emergency by taking on the inherited imbalance of power" have emerged, such as in the London Borough of Newham's Just Transition Plan (Newham Council, 2023). By making social justice and its related public participation a priority by framing climate stress as an intersectional issue, as well as stating the importance of "inclusion of socially vulnerable populations as full participants with the agency to shape the decisions that affect them", it meets the requirements formalised by scholars Malloy and Ashcraft (2020) to ensure social justice in climate adaptation. The implementation of specific measures is yet to be evaluated, as this first Just Transition Plan in the UK was approved in December 2023. A contrasting example is again the one of TTT. In online public consultations with the mayor, issues regarding water poverty were raised (London Assembly, 2011) but not explicitly addressed in the implementation, nor were they followed by compensatory measures. The GLA acknowledged that "high climate risk coincides with areas of income and health inequalities" and produced a climate risk map in collaboration with Bloomberg Associates (Greater London Authority & Bloomberg Associates, 2024), of which effects are yet to be observed.

Newham Borough, an Example of Socially Just Multi-Level Governance

As stated, a systemic understanding of how the fact that "the people who contributed least to [Climate Change] are, in many cases, positioned to suffer the most [from its effects]" (Shi *et al*., 2016; Roberts, 2009) unfolds at the local level is crucial, and Newham's Borough has made it a priority. The plan identifies "five main forms of climate injustice [that] have been identified in the UK" (Newham Council, 2023), namely the disproportion in climate change responsibility and vulnerability according to the level of privilege, as well as the disproportional contribution to financing climate policy response and benefits drawn from those, and finally the underrepresentation of the most vulnerable voices in decision-making. To inform the response to these injustices, a combination of quantitative data analysis and on-the-ground research were pursued, including a "recent study by Arup, Decosm and Social Broadcast with communities of colour in Newham and Thamesmead [that] highlights the lived experience of racialized groups" by providing "direct expressions of how systemic inequalities intensify the risks of climate impacts among racialized communities," knowing that "people of colour in the UK are four times as likely to live in areas at high risk of dangerous heat" (ibid). Its conclusions point to a disconnection from decision-making, lack of inclusion and access to green spaces, and a lower quality built environment for vulnerable communities. The Borough's specific exposure to climate risks, as a whole, is also addressed in terms of social justice and compared to other areas of the city. Indeed, Newham shows a high relative deprivation ratio compared to the rest of London: 1.49 according to Trust for London (Income Deprivation Within London Boroughs, 2020), and ranks as the 27th most deprived out of the 32 London boroughs. The high risk of overheating and presence of Urban Heat Islands (it is the "second most at-risk area to extreme heat in the UK") is due to a lack of green spaces, high levels of impervious surfaces, and extensive vehicle use on major roads (ibid). The previously mentioned exacerbation of health inequalities has taken dramatic turns in Newham, where the 2022 flooding led the local hospital, providing health care for mostly deprived population of the borough, "partially underwater and unable to accept A&E patients due to torrential rain" (ibid). How come social justice is tackled at the borough level through tangible plans but not at the metropolitan scale? Can we hypothesise an unlucky coincidence that the socio-economic

differential of vulnerabilities stops at the administrative boundaries of Newham?

Holistic adaptation strategies (as opposed to specific infrastructure) at a borough level, where social justice is a transversal consideration, relying on public funding with the induced higher accountability requirements gains from the comparison in terms of meeting social justice goals in adaptation. It is, therefore, in this case, building on the previous observations on the "significance of cities to adaptation efforts due to their populations vulnerable to the effects of climate change, contribution to climate change, and capacity to develop effective climate mitigation and adaptation solutions" (Bulkeley *et al.*, 2013), at the smallest governance scale that social justice gets integrated the most thoroughly in climate adaptation strategies.

Cities Networks as Alternative Governance of Adaptation Policies

Adaptation to climate change is often framed as a local or national public good, even though some epistemic communities argue that it should be considered politically as a global public good to fill the adaptation finance gap (Khan & Munira, 2021). Adaptation policies, provided in a local context against a specific climate-related constraint, bring about numerous complexities in the face of multi-level governance (MLG). Indeed, "the interaction between layers of government, each responsible for a given territory within a hierarchy of nested units," as defined in Faludi (2012), sheds light on the entanglement of several layers of decisions. However, the concept lacks tools to understand the political and institutional dynamics at each level, which is critical to understanding the product of the decision-making process at the city level (Mocca, 2019). While adaptation policies do not seem to thrive in a traditional MLG context, given the adaptation gap left to fill, we argue that other approaches based on trans-local cooperation or transnational municipalism could be useful concepts to unlock public finance for urban adaptation projects. Manifesting themselves mainly through cities' networks at a global or regional (namely EU) level, we argue that those structures can represent a credible alternative to the limits of traditional decision-making processes and a recomposition of the hierarchy in which the cities evolve.

A seminal paper on urban geography in 1945 set the ground for considering cities as existing within a network of interurban relations (Derudder *et al.*, 2007; Harris & Ullman, 1945). This second nature of cities described by Harris and Ullman (1945) has been given a new life by the concept of "global cities" described by Saskia Sassen, where financial, cultural, and social relations would deploy themselves between big metropolises over the national frontiers (Sassen, 2001, 2004). Those relations between cities substantially impact recomposing the traditional scale of powers (national—regional—local). At the same time, globalisation increased the size of the web immensely and the strength of the links between cities, making them interconnected and somehow interdependent (Derudder *et al.*, 2007). In the face of climate change, metropolises can become "normative and performative entrepreneurs" by spreading ideas and practices to adapt to climate change at a wide transnational scale *via* climate city networks (Aykut & Dahan, 2015; Lee, 2013). Aykut and Dahan argue for a change in "gouvernementalité" of climate change, namely by depoliticizing the issues of climate change and climate adaptation. Environmental policies have been victims of depoliticisation processes and policies that treat climate change as a technical problem, avoiding the core but latent question of society's choice of climate policies (Swyngedouw, 2011). In this ongoing process, cities have space to initiate experiments, motivated by a renovated and politicised view

of climate adaptation, at a local level, then spread the good practices among networks.

For example, the city of Totnes (Devon, England), gathering 8500 souls, saw the development of the movement Transition Town Totnes in 2005, brought together by Rob Hopkins and activists (Aykut & Dahan, 2015; Semal, 2013). This movement aimed to find an answer to the oil production peak, which would signify the end of both cheap and abundant energy and economic growth. It led to the redaction of a thick local energetic degrowth plan in full collaboration with the inhabitants on a deliberative basis. This is an interesting case where inhabitants and activists developed a politicised view of the ecological transition at a local level, then translated it into a territorial and local strategy to imagine a post-growth world. This kind of movement gave valuable lessons in managing to acculturate the local population with highly politicised issues of the post-growth world and how ideas circulated over the frontiers. Giving theoretical and practical examples to be developed locally, Transition Towns had in 2009 over a thousand local branches, allowing for a translocal cooperation and diffusion between cities. Even though Transition Town is not a proper city network, we can see a recomposition of the cities' position into the traditional hierarchy of decision. Taking the example of Baltic cities, Escach (2015) describes the shifts of governance and decision-making dynamics allowed by the structuration of cities' networks. They act as a third space facilitating policy between local players who wish to cooperate in a privileged way. Indeed, the members

> *"participate, symbolically or practically, in the production of a new networked space on a larger scale, and act at all levels through their discourse, their exchanges of experience and know-how, and their joint projects" (Escach, 2015).*

If we focus on climate adaptation or mitigation projects, this idea of recomposition of levels *via* a city network and the new shift in 'governmentality' is even more interesting. According to the author's typology of cooperation, the most common type of cooperation is opportunity collaboration, which allows cities to use information, knowledge, or network funds for a specific project's success. By the intercession of networks, cities can learn from each other, exchange practices and ideas, crucial to climate adaptation projects because cities sharing ecological constraints can lead to replication of projects, financing schemes or participation mechanisms. As summarised up by Aykut and Dahan (2015):

> *"As things stand, mutual learning takes place mainly from one city to another (a phenomenon known as diffusion) or via the nation state, which lays down rules and prescribes developments (downloading) or generalises experiments that have been successfully applied in one city (uploading). The global arena could constitute an additional level, encouraging sustainable urban policies, facilitating mutual learning and working towards the generalization of new approaches that reduce the urban carbon footprint."*

The literature points out that cities can skirt the national and even the EU levels, which would allow innovative alternatives to be developed in climate adaptation projects, including financing schemes, without falling into the pitfalls that traditional MLG may offer.

Conclusion

To summarise, while traditional multi-level governance (MLG) provides a structured framework for addressing climate adaptation, it often falls short in integrating social justice, as evidenced by London's Thames Tideway Tunnel (TTT) project. The TTT exemplifies how financialisation and large-scale infrastructure projects in the UK often prioritise economic

returns and investment attraction over equitable socio-ecological outcomes, sidelining social justice consideration. As presented by academics, both autonomous and planned adaptation can fail to protect vulnerable groups and may exacerbate their vulnerabilities. Risk susceptibility is often overlooked in market-driven strategies as these tend to exclude exposure, sensitivity, and adaptive capacity to hazards from their schemes.

Effective climate adaptation requires democratic and participatory processes to ensure social justice. For instance, borough-level initiatives, such as Newham's Just Transition Plan, demonstrate that smaller governance scales can effectively integrate social justice into climate adaptation strategies through public participation and inclusive planning. Participation legitimises adaptation measures, incorporates local expertise, and can prevent maladaptation. The plan emphasises the inclusion of vulnerable populations in decision-making, highlighting the borough's proactive approach compared to the broader city strategy. On the contrary, the Thames Tideway Tunnel serves as a case where public participation was minimal and mainly utilised to secure funding rather than addressing social justice.

Traditional multi-level governance can be inadequate for climate adaptation due to its complexity and lack of tools to understand political and institutional dynamics. City networks offer a promising alternative by facilitating translocal cooperation and mutual learning through the exchange of best practices. These networks can circumvent national and regional limitations, promoting innovative and socially just adaptation measures. By leveraging the interconnectedness and collective learning of cities, this approach can address climate adaptation challenges more holistically and equitably. Thus, city network-led MLG holds significant potential to prioritise climate justice more effectively than traditional governance models.

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Conclusion

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After travelling to London to understand the complexity of climate adaptation finance, major questions were raised which we tried to answer throughout this report.

Figure 35. Final debrief at the end of the trip.

With regards to adaptation, several questions must be raised. First, what do we adapt for? The choice of adaptation infrastructure depends on the climate scenario we expect and the targeted timescale. Models are needed to determine what kind of risks are to be expected and hence, how to *materially* adapt. Even though members of the London Assembly assert their preference for Green Infrastructure (GI), which is less costly to put in place and has lots of co-benefits, we have seen that huge projects of grey infrastructure, risk path dependency and maladaptation, also are being built in London (e.g. Tideway Tunnel).

Once this first obstacle has been overcome, a second question emerges: How do we finance adaptation? This trip has been the occasion to discover and learn about different financial tools to create value out of adaptation projects, such as: Green Bonds, Public-Private-Partnerships, de-risking, Green Taxonomy, Cat Bonds, tax regulation, etc. Nevertheless, the financial gap and the lack of public and private actors who focus on adaptation is salient.

The diversity of financial tools has led us to wonder: Who finances climate adaptation? The various field visits allowed us to get to know actors from the field and understand their strengths and weaknesses (chapter 1). *Public actors* (GLA, Environmental Agency) seem to be the most adequate to tackle matters of public interest such as social justice, but dramatically lack financial means, especially in the United Kingdom where public services are weakened by austerity measures. On the other hand, *private actors* (Thames Tideway Tunnel, Bankers Without Boundaries), seem to have relatively more financial flexibility but lack incentive to invest in climate adaptation, and align with public interest. Nevertheless, we learned that both types of actors can work hand in hand through blended finance or public-private partnerships (PPPs) to bargain between their specific constraints, financial means, or consideration of public interest. Furthermore, other kinds of actors are involved, such as international organisations that apply pressure on governments regarding the need to adapt (GIEC, COPs), private consultants for climate (CPI) or city networks (C40 Cities), who bring their expertise to support cities along their path to adaptation.

The three above questions were asked in the context of the United Kingdom and especially in London, the capital. After our trip and an extensive literature review, we understood the specific contexts of this city. The articles on adaptation in London and Finance in London (chapter 1) shed light on: the financial adaptation gap that arises both because of insufficient public budgets and lack of private investment; attempts to attract investment through strategies (London Climate Finance Facility); difficulties to plan adaptation due to uncertainties linked to climate change models;

lack of public regulation on adaptation; the role of London as a finance hub and the power of the City of London Corporation; the impact of Brexit on national adaptation plans (NAP); etc.

This field trip has led us to understand several key political and ethical challenges of climate adaptation finance. Keeping in mind the complexity of defining adequate adaptation solutions and financial models, we wanted to critically engage with systemic discourses and structural problems regarding public—private responsibility (chapter 3). A general frustration was present at the end of our trip. We felt a lack of political engagement and public commitment to secure their capacity to act. Instead, PPPs as promoted by international organisations and city networks, were favourably perceived among the public actors we met with in London.

However, working with the private sector requires putting a price tag on essential adaptation measures for the survival and wellbeing of the population, and compliance with the financial imperatives including return on investment (ROI). Section 3.1 *Private finance as a new income stream* and 3.3 *Financial re-empowerment of the public sector* urges us to consider the legitimacy of the private sector to make decisions that affect the general public. Additionally, section 3.2 *The challenge of capturing financial flow,* highlights the enormous revenue loss from tax evasion, thus further hindering the capacity of public actors to act in favour of adaptation. Both the critique of monetising adaptation and the impact of tax evasion relate to the lack of action in favour of adaptation to a strictly financial problem. It is a way to depoliticise the issue, while re-empowering the public sector could allow for more social justice, as argued in section 3.4 *Multi-level urban governance for climate adaptation.* When agency is in the hands of the public sector, the question of 'what do we adapt to and how' becomes a political choice. Adaptation has a direct effect on the life circumstances and material conditions of millions of citizens, leading us to wonder about the foundations of democracy. Specifically, environmental democracy includes the principles of participation, transparency, and justice. To ensure a just allocation of land and natural resources, meaningful public participation and inclusivity is critical (Pertaub & Green, 2024). This would require further research on the topic to understand the view and the opinion of citizens.

Figure 36. Leaving Walthamstow Wetlands, the last moments of the trip. © 2024 Antoine Tisserant.

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