

A GREEN BANK OF ENGLAND

Central Banking for a
Low-Carbon Economy

First published May 2018

ACKNOWLEDGEMENTS

We would like to thank Partners for a New Economy for funding this project. We are grateful to Sini Matikainen, Emanuele Campiglio, Dmitri Zenghelis, and Stefano Battiston for sharing their research, and to Josh Ryan-Collins, Frank van Lerven, Pierre Monnin, Alexander Barkawi, and Fran Boait for their useful comments and feedback. Thanks also to Stan Jourdan, Ludovic Suttor-Sorel, Ulrich Volz, Ingrid Holmes, George Triggs, Rhys Gordon-Jones, Matthew Scott, Julia van Huizen, Carsten Jung, and Nick Robins for their discussion and input; to Zack Livingstone for research assistance; and to Jamie Walton and David Clarke for proofreading. Finally, we are grateful to all of Positive Money's supporters and donors, without whom this paper would not be possible.



Partners for a New Economy is an international donor collaborative striving to change the way the economy operates so that it works for people and the planet.

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CONTENTS

Abbreviations	2
Executive Summary	3
Summary of Recommendations	5
Introduction	6
CHAPTER 1: WHY CENTRAL BANKS SHOULD GO GREEN.....	9
1.1. Risk in the UK and the cost of inaction	9
1.2 Driving investment for the low-carbon transition	14
CHAPTER 2: THE BANK OF ENGLAND AND CLIMATE SUSTAINABILITY.....	16
2.1 Climate change work at the Bank of England	16
2.2 Monetary policy has harmed the climate	19
2.3 The Bank of England’s mandate	22
CHAPTER 3: THE GROWTH OF GREEN FINANCE.....	27
3.1 Financial disclosures: no panacea	27
3.2 Green finance in the UK: advances and limitations	29
CHAPTER 4: A VISION OF A GREEN BANK OF ENGLAND.....	32
4.1: Structuring green finance markets	32
4.2: Green macroprudential regulation	33
4.3: Greening monetary policy	35
4.4. Mandate reform for the climate crisis	38
Conclusion	43
Endnotes	45

ABBREVIATIONS

BEIS	Department for Business, Energy & Industrial Strategy
CCC	Committee on Climate Change
CBPS	Corporate Bond Purchase Scheme
DEFRA	Department for Environment, Food and Rural Affairs
FPC	Financial Policy Committee
HMT	Her Majesty's Treasury
MPC	Monetary Policy Committee
PRA	Prudential Regulation Authority
TCFD	Taskforce for Climate-Related Financial Disclosures

EXECUTIVE SUMMARY

Since the Paris Agreement in 2015, climate change has risen to prominence in financial circles. On the one hand, to transition to a low-carbon economy, banks and other financial institutions will need to shift billions of pounds away from fossil fuels to fill the gap in green investment. On the other, a changing climate threatens the profits and stability of the private financial sector, either through physical damage from weather events or revaluations caused by technological or policy changes.

Central banks, as coordinating institutions at the heart of the financial system, are aware that they have a role to play in managing these issues. The discussion has begun through conferences on the topic and the founding of international networks, in which the Bank of England has played an active role.

However, officials at the Bank, like those at most central banks, see the issue only through the lens of risk and financial stability. They reject the arguments put forward by many in civil society calling for their assistance in raising investment for the low-carbon transition.

Their approach runs the risk of leaving meaningful action until it is too late. A concern for financial stability looks incoherent over time unless it considers the long-term viability of the economy. The nature of climate change is such that either physical damage from weather or radical changes in technology and policy *will* occur in some combination, so action is needed now. The Bank of England's Financial Policy Committee also currently overlooks the importance to the climate of commercial banks' power to create new money when they lend. This structural feature of the money and banking system leads to a market failure in the form of excessive credit allocation to environmentally destructive activity like fossil fuel production, and insufficient lending to green industries. Finally, current policy at the Bank is incoherent in the sense that monetary policy interventions since the financial crisis of 2007-08 have privileged high-carbon sectors.

This paper argues that it is well within the capacity of central banks to do more to support decarbonisation. We present several policies that the Bank of England could adopt, ranging from the adaptation of existing rules and schemes to bold new forms of monetary policy for use in times of crisis.

The Bank's reluctance indicates that the major hurdle is a political one. Central bank policy cannot take place in a vacuum and must speak to the current institutional framework and wider context, including developments both in government policy and in financial markets. Yet the Chancellor of the Exchequer, a member of the elected government, could very easily make simple alterations to the Bank's

mandate via the remit for the Monetary Policy Committee and recommendations to the Financial Policy Committee. These changes would accelerate progress towards greener monetary and financial policy.

We reject arguments claiming that a greener central bank would be somehow illegitimate. Monetary policy since the crisis has not been 'neutral' with respect to the market or to the environment. All monetary policy interventions have fiscal consequences; it is a political question to design the remit to produce those that are most desirable. Political reform could make central bank policy that harms the climate illegitimate.

Designing a climate-friendly central bank for the 21st century is fundamentally a political process. A substantial literature now exists on the financial and economic effects of climate change. It is time policymakers took this on board and envisaged a new mandate for the Bank of England to reflect it.

SUMMARY OF RECOMMENDATIONS

This report makes several core recommendations for the Bank of England and departments of the UK government to act upon:

Concerning research and policy at the Bank of England:

- the Bank should publish its own green lending guidelines for commercial banks to ensure the UK's growing green finance offering brings genuine environmental benefits;
- the Bank should disclose the carbon risk of the assets on its own balance sheet and exhibit best practice in terms of disclosure for financial companies;
- the Bank should no longer buy bonds issued by fossil fuel companies;
- the Bank should produce open and transparent research into how overt monetary finance might interact with the need for green and sustainable investment in the UK.

Concerning the Financial Policy Committee:

- the FPC should use its authority to promote work at the Bank on macroprudential risk assessment tools to measure and regulate the climate risk companies and investors are exposed to;
- recommendations made as part of the remit for the FPC should refer to 'environmental sustainability' under the heading of 'matters that the Financial Policy Committee should regard as relevant to the Bank's financial stability objective'.

Concerning the Monetary Policy Committee:

- Bank research should prioritise how to adapt the Monetary Policy Committee decision-making process to build in the macroeconomic impact of the climate crisis;
- the Treasury, in concert with the Department for Business, Energy and Industrial Strategy, should conduct a fresh review of the monetary policy framework with respect to the impact of climate change on the UK economy and consider changes to the remit for the MPC;
- considering such a review, the Chancellor of the Exchequer should update the remit for the MPC to require that its decisions take account of and communicate the links and potential trade-offs between climate sustainability and price stability.

INTRODUCTION

Climate change presents a fundamental challenge for finance. Central banks underpin and oversee the financial and monetary system and have enormous resources at their disposal, so should do more to support a sustainable green transition.

Two arguments support this view. Firstly, finance faces systemic risk both from the physical damage caused by a changing climate and from changes in policy, technology and market structure associated with a low-carbon transition. Given that many central banks, including the Bank of England, have a mandate to safeguard financial stability, climate change affects their duties.

Secondly, trillions of pounds of investment are needed globally to fund the low-carbon alternative. In the UK, the political structure recognises the urgency of climate change in the form of legally binding targets for reductions in greenhouse gas emissions. At the start of 2018, the UK government remained behind on meeting these targets.¹

The defining feature of the climate crisis is its urgency. Inaction now merely deepens the risk to financial stability in the long run. Despite a growing market for green finance, huge sums still flow to carbon-intensive firms and industries that will see their assets lose their value in as little as 10 or 20 years' time.

SO WHY DO CENTRAL BANKS RESIST THE CALL FOR PROACTIVE POLICIES?

In the UK, as elsewhere, the answer lies in a barrier that is both cognitive and institutional. The Bank of England's current mandate emphasises the short-run stability of prices and of the financial system but ignores broader social and environmental conditions and their long-run effects. The Bank's monetary policy objective 'is to deliver price stability – low inflation – and, subject to that, to support the Government's economic objectives including those for growth and employment.'² Ambiguity over other objectives breeds inaction or, worse, policies with harmful side effects. While the Bank has publicly recognised the threat posed by climate change, it has unintentionally promoted high-carbon sectors through some aspects of its monetary policy. The result is incoherence between monetary policy and the Bank's concern for financial stability.

This paper argues that reform to the Bank of England's mandate would reshape the institution to align with the low-carbon transition. While we propose several policies that could be adopted under the current framework – including green financial regulation to tackle climate-related financial risk – a new mandate would accelerate progress on climate sustainability. It would also allow the Bank, using novel monetary policy tools, to cooperate with the Treasury to raise green investment in the UK.

Time is running out to shift the financial sector and the wider economy away from fossil fuels and towards a green alternative. The institutional framework of the central bank is often overlooked in this equation; we argue that it should be placed front and centre of a renewed, sustainable financial system.

MANDATE REFORM: A CENTRAL BANK HARDWIRED FOR CLIMATE SUSTAINABILITY

Central banking is political – not in the technical detail of how it is performed, but in the very objectives assigned to it in the first place. The Bank of England’s legal independence from the democratic institutions of the UK government is an institutional arrangement designed as a response to the macroeconomic challenges of the 1970s and 1980s, particularly inflation caused by the ‘political business cycle’.

The arrangement is one of ‘instrument independence’ (or ‘operational independence’) but not ‘goal independence’.³ The Bank may, for the most part, choose the tools with which it pursues its objectives, but it does not set the objectives itself. Those are set by Parliament. Following the 2007-08 financial crisis, Parliament extended the Bank of England’s objectives to include safeguarding the stability of the financial system. In other words, central bank goals have varied according to historical, economic, and social context. Which goals are suitable is ultimately a question for society, via Parliament. As the Bank’s Chief Economist Andy Haldane maintains, central bank independence is ‘part of a social contract with the public’.⁴

Simple alterations to the remits delivered to policymaking committees by the Chancellor of the Exchequer could hardwire the Bank of England for sustainability. These changes would not jeopardise the Bank’s pursuit of price stability and near-term financial stability. The innovations that empower the Bank to manage inflation are firmly established and flexible enough to accommodate climate-positive criteria. Moreover, monetary policy interventions already have fiscal and distributional consequences, so concerns that it would be illegitimate for the Bank to privilege green sectors lose much of their force. Instead, the question becomes how to design the Bank’s mandate to achieve the most beneficial environmental side effects.

We need a central bank that better understands its critical role in dealing with the climate crisis. In the face of a banking crisis, public institutions bailed out the banking sector. To borrow an emergent metaphor,⁵ it is time now to bail out the climate.

THE STRUCTURE OF THIS PAPER

The first chapter outlines the arguments for central banks to address climate-related financial risk and contribute to the low-carbon transition, paying particular attention to their relevance to the UK.

The second chapter explores the Bank of England’s track record on climate. Its policies need to be set in context, including the institutional framework for financial and monetary policymaking – the Bank’s mandate. Under the current mandate, action is only justified if climate risk threatens financial stability, and even then, the Bank has been slow to act.

The third chapter looks at another dimension of the context for green central banking in the UK: how green finance has been promoted and elevated by several government and industry initiatives, and how they square with the Bank of England's role.

The fourth and final chapter surveys several key policies that would provide substantial benefit to the low-carbon transition in the UK and help shore up the financial system against climate risk. It also revisits the mandate and lays out our proposals for reform to hasten the introduction of these bolder policies. We also make recommendations throughout for changes that would free the Bank from its contradictions and make climate-friendly policies a reality.

CHAPTER 1:

WHY CENTRAL BANKS SHOULD GO GREEN

The financial system has come under renewed scrutiny for its impact on environmental goals and outcomes. Although central banks reside at the heart of this system, at least on a national scale (or supranational, as in the case of the EU and the European Central Bank), they rarely receive enough attention from governments.

Some progress has been made. Conferences on climate change and central banking have taken place at Der Nederlandsche Bank (DNB) and the Bank of England in recent years. Advocates for monetary institutions to take a firmer stance deploy two strong arguments:

1. climate change and society's response to it create risks that threaten the stability of the financial system, which it is central banks' duty to monitor and protect;
2. as public institutions responsible for regulating finance and creating public money, central banks should contribute towards closing the 'green investment gap.'

1.1: Risk in the UK and the cost of inaction

The first such argument construes climate change primarily as a source of financial risk. This risk affects individual firms, but because of the far-reaching impact of the environment on economic activity, also has the potential to be systemic. In policy frameworks and in the literature, a distinction is drawn between 'physical' and 'transition' risks.⁶

PHYSICAL RISK

‘Physical’ risk is the damage and resultant loss in value that occurs due to weather and climate-related events like floods and storms. Extreme weather events can have a dramatic effect even over a relatively short time period. For instance, ‘total economic damages for England and Wales from the winter 2013 to 2014 floods were estimated to be between £1,000 million and £1,500 million, with a best estimate of £1,300 million.’⁷

Physical damage hurts the financial position of businesses and households. In a 2016 survey by Acclimatise, 86 per cent of companies identified one or more major climate risks to their businesses. However, 34 per cent of the risks identified are being managed through a business-as-usual approach.⁸ The relative lack of action may be due to a reliance on insurance. Costs that spill over into the insurance sector impact on the wider financial system. This goes for damage abroad as well as at home. British insurance firm Hiscox saw its pre-tax profits decline by over 90 per cent from 2016 to 2017 due to the high incidence of natural disasters in the latter year.⁹ Munich Re estimates the total cost of 2017 to the global insurance industry to be \$130 billion.¹⁰

However, the total cost of weather events and changes may become much larger than tangible damage to property and infrastructure. The cost includes ‘the lost output resulting from reduced productive capital and the output that is lost as capital when it is redirected towards reconstruction of assets that were destroyed’.¹¹ It is also plausible that these negative effects on growth can be persistent, in a form of ‘hysteresis’,¹² resulting from permanent disruption to supply chains and resource management.

TRANSITION RISK

The second category of risk – ‘transition’ risk – results from the revaluation of assets due to changes and costs associated with the shift to a low-carbon economy. For example, new low-cost renewable energy technologies will displace conventional forms of power generation; reputational risk to banks from divestment campaigns threatens their share price and thus their equity; and a high carbon tax would increase costs for CO₂e emission-intensive firms.

Carbon-intensive assets might therefore become ‘stranded assets’ – ‘assets that have suffered from unanticipated or premature write-downs, devaluations or conversion to liabilities’.¹³ According to Caldecott *et al.*, the processes associated with climate change can create a ‘major discontinuity’ leading to sudden and significant changes in asset values.¹⁴ Trends in technology, market sentiment or policy will render many assets associated with the high-carbon economy unaffordable or obsolete, including proven reserves of fossil fuels.

The size of these changes can be seen in experience and in forecasts. A Carbon Tracker Initiative report showed how the EU’s largest 5 power generators collectively lost over 37 per cent of their value from 2008 to 2013.¹⁵ And projections published by Mercer show that ‘annual returns from the coal sub-sector could fall by anywhere between 18 per cent and 74 per cent over the next 35 years’.¹⁶ Some energy assets

might even become stranded if the use of those assets remains too high-cost in the future as broader energy costs fall. Set against the plummeting cost of renewable technologies, business models reliant on coal or oil may not be financially viable in the energy mix of a decade from now.

The UK’s finance-led growth model (total financial assets represent a much higher percentage of GDP than in other countries¹⁷) is particularly vulnerable to the destabilising effects of transition risk. In 2011, the UK was the ‘financial home to the CO₂ potential of around 100 times its own reserves’¹⁸. In 2015, the Governor of the Bank of England, Mark Carney, identified that “19 per cent of FTSE 100 companies are in natural resource and extraction sectors; and a further 11 per cent by value are in power utilities, chemicals, construction and industrial goods sectors.”¹⁹ Data for the FTSE 100 at the end of March 2018 show that these proportions have only increased, as shown in Figure 1.

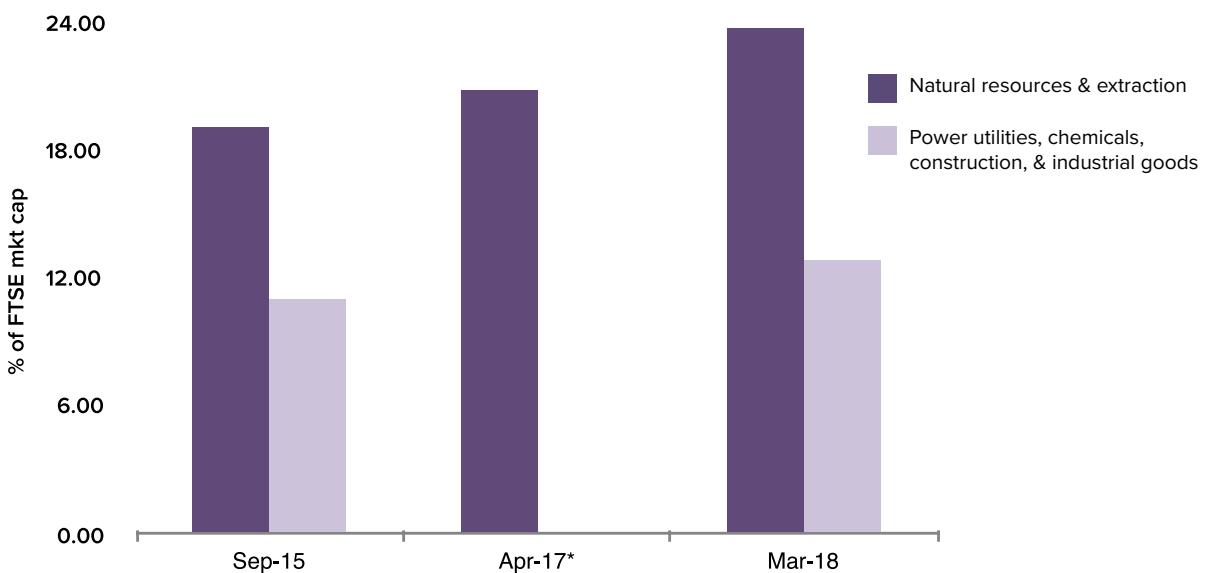


Figure 1: The share of FTSE 100 companies by market capitalisation in relatively carbon-intensive sectors has increased over recent years.

**Limited data on power utilities, chemicals, construction & industry*

Source: Carney 2015²⁰, FTSE Russell, WebfinancialGroup UK and author’s calculations

What happens to the value of these companies doesn’t just affect their shareholders. The UK banking sector is exposed through substantial loans to fossil fuel companies. Recent reports offer a grim assessment of the UK banking industry’s stance vis-a-vis the mounting climate crisis.

Firstly, the Fossil Fuel Finance Report Card, published by a coalition of organisations including BankTrack and Rainforest Action Network, shows that two of the largest players in the industry – HSBC and Barclays – make billions of pounds in loans to ‘extreme fossil fuel’ firms each year.²¹ HSBC was the highest valued company in the FTSE 100 in March 2018 (followed by oil and gas company Royal Dutch Shell).²²

Secondly, a recent paper by ShareAction examined the policies 15 European banks

are adopting to handle climate concerns.²³ Here HSBC was among the top performers, largely due to its commitment of \$100 billion in green finance by 2025. However, divestment from fossil fuels remains necessary to achieve carbon targets, and HSBC's continued investment in stranded assets merely worsens systemic risk. Lloyd's Banking Group and RBS, also among the UK's largest banks by total assets, performed markedly worse than HSBC and Barclays in their preparations for climate risks.

While awareness of the need to shrink carbon-intensive industries is spreading, there is little sign that progress is being made fast enough. Indeed, there is some evidence that transition risks might even be sharpening. London's stock markets became *more*, not less, carbon intensive between 2011 and 2013.²⁴ In autumn 2017, ShareAction reported that fossil fuel firms Shell and BP – the second and fourth most highly valued companies on the FTSE 100 - use 'base case' planning scenarios consistent with 3-5°C+ of global warming.²⁵

A working paper published by Bank of England staff²⁶ uses event analysis to assess whether valuations of firms' equity are responsive to developments in climate policy. Surprisingly, the effect of the Paris Agreement on abnormal returns for oil and gas companies is statistically insignificant. The authors suggest two explanations: either investors don't think political climate commitments are credible, or they are choosing to divest over several years rather than rapidly in response to specific news.

Short-term profits still prevail over long-term planning in financial institutions, even among actors who profess their commitment to climate goals. For instance, the U.S. asset management firm Blackrock, which has issued public warnings about climate change and the energy transition, voted against 'scenario-planning climate change resolutions' in 14 oil and gas companies at their annual general meetings of shareholders.²⁷

The need for policy change to address the climate crisis is inescapable; technology is changing rapidly. It is not a question of whether transition risk materialises, but how and when. As the world economy continues to burn fossil fuels, the shock – when it eventually arrives – will be much more severe. And fossil fuel producers are not the only entities at risk of seeing their assets become stranded. The same applies to any infrastructure that depends on high-carbon energy, ranging from heating systems to long-distance flights.

Transition risk does not depend solely on UK policy: developments abroad matter too. One example, as the authors of *Unburnable Carbon* write, is that 'many [coal] producers' current growth plans are predicated on an unchecked demand from China for coal.²⁸ Similarly, government policy and regulation in other countries can produce knock-on effects in London by way of the balance sheets of large energy or industrial firms.

CLIMATE RISK, SYSTEMIC COMPLEXITY, AND FINANCIAL SUPERVISION

The evidence presented above shows that climate change represents a source of substantial financial risk, and that, crucially, markets misprice financial assets by underpricing climate-related risks. This market failure applies at the level of individual firms, but also leads to a build-up of *systemic* risk.²⁹

The economic and financial system in the 21st century is especially vulnerable to climate-induced losses precisely because it is so interconnected. Any assets linked to carbon-intensive activity or production could lose their value over a very short period. This will lead to second-order effects, upsetting production chains in other industries and reducing household income for people employed in the affected sectors. In turn, banks and financial entities with a stake in those firms and households will suffer losses.

To make matters worse, the process of climate change itself depends on financial flows, making for a complex feedback cycle. Figure 2 demonstrates how the cycle of financial regulation, investment flows, and exposure to systemic risk feeds into a parallel cycle of sectors in the real economy, their CO₂e emissions, and policies addressing climate change.

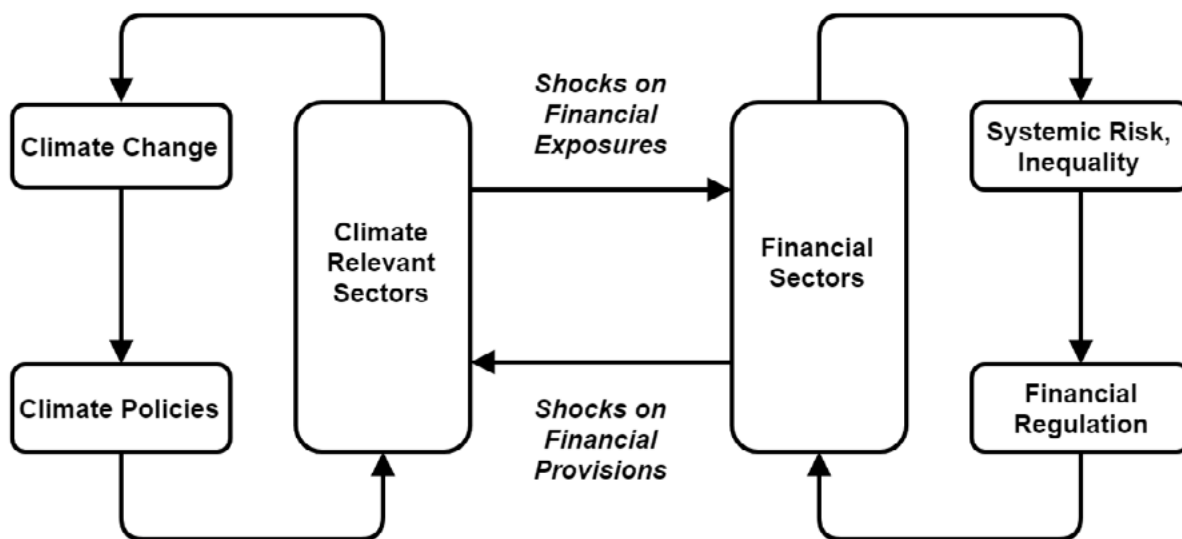


Figure 2: The climate, economy and the financial system interact through a complex series of processes and feedback cycles.

Source: Battiston et al. 2016³⁰

A recent attempt to map the chains of direct and indirect financial exposure across the economy finds that feedback loops can make the effect of policy changes substantial. Climate change leads to technology and policy shocks that are unanticipated – in part because market actors don’t think climate commitments are credible – which leads to the ‘systematic mispricing of assets.’ Shocks then ripple through the financial sector and real economy via second-order effects, causing major losses for banks, firms and households.³¹

Managing this feedback loop is an enormous challenge for regulators. A first step is to establish a credible policy framework, to minimise mis-pricing and the exposure to risk in the first place. For central banks tasked with safeguarding financial stability, the arguments above therefore justify climate-positive action – with a significant caveat. Short-run financial stability is potentially incompatible with a rapid low-

carbon transition. There is a risk of a destabilising revaluation in high-carbon assets, including not only fossil fuel reserves but also any infrastructure tailored to the high-carbon economy.

A second problem with a too-rapid transition, identified by the Dutch central bank in its report *Waterproof?*, is the chance of ‘green bubbles and reputation damage resulting from greenwashing’ (when assets are labelled as green but actually have a high carbon intensity).³² Although it is uncertain whether an expanding market for green finance does in fact pose a threat to financial stability, what matters to the prospects of a successful low-carbon transition is whether central bankers perceive such a threat and take cautionary action.

1.2 Driving investment for the low-carbon transition

A separate rationale for greening central banks emphasises their role as public institutions with a duty to promote the public good. This view contends that central banks should assist in channelling low-carbon investment, be it public or private.

Huge sums are needed to finance investment to mitigate and adapt to climate change. ‘Green’ industries need to grow rapidly to transform the economy for the 21st century, but even other, more conventional sectors – both corporate and household – have to adjust, including by investing in physical infrastructure. The ‘green investment gap’ is the difference between these required figures and current flows. Estimates place the gap at some \$0.7 trillion yearly on a global level³³ and €180 billion yearly in the EU alone.³⁴

As we have seen, the financial sector is currently holding back the green transition. In particular, Campiglio argues forcefully that the structure of the banking system is a major culprit.³⁵ While a high enough price on carbon in the form of a tax on CO₂e emissions could in theory fix the market failure that undervalues environmental goods vis-à-vis polluters, a second market failure remains. This is in the market for credit - specifically, loans made by banks – and acts as a barrier to the required level of investment.

Since banks are able to create money *ex nihilo* when they make loans,³⁶ they face an incentive to extend loans to projects that generate the most profit rather than those that are the most socially useful. As Campiglio writes, ‘public regulators... have therefore very limited control on the amount of credit being created, and how this is allocated... The dynamics of money supply is likely to be suboptimal from a social perspective’.³⁷

Central banks, as coordinators and supervisors of the banking system, should arguably shape that system to better reflect the social optimum. There are several policies they could use to do so, from assisting in market development by publishing guidelines and frameworks for green finance, to discouraging climate-negative investment through regulation.³⁸ These policies will be discussed in more detail in chapter 4.

Here a rift between campaigners and policymakers arises over the question of green investment. For instance, authors at the New Economics Foundation place the investment view front and centre in their report 'Central Banking and Climate Change'.³⁹ But those in central banks see this function as a 'political' concern well beyond the scope of their mandates. Accordingly, some campaigners for reform have been minded to focus only on the risk argument.⁴⁰ However, this paper contends that mandates should not be viewed as written in stone, and that the central bank's purpose should itself be subject to debate.

CLIMATE POLICY IN THE UK

It is also questionable whether a policy that helps allocate credit towards climate mitigation and adaptation and away from carbon-intensive activity is really so 'political'. In the UK, the debate over policy required to fight the climate crisis has, to some extent, been raised out of the political arena. Assessment of where the economic needs lie to meet the low-carbon transition and reduce emissions is already delegated to an independent body, the Committee on Climate Change (CCC).

The Climate Change Act 2008 established the CCC, set legally binding targets for reductions in emissions, and requires the government to periodically produce a risk assessment and adaptation plan. Managing the low-carbon transition is the responsibility of the Department for Business, Energy and Industrial Strategy (BEIS), while adaptation falls mainly to the Department for Environment, Food and Rural Affairs (DEFRA).

The CCC's mandate is to advise the government on the level of the target for each period – the 'carbon budget' – as well as on 'sectors of the economy in which there are particular opportunities for contributions to be made towards meeting the carbon budget'.⁴¹ It currently estimates that the UK government will fall short of achieving its fourth (2023-2027) and fifth (2028-2032) carbon budgets even if all the policies outlined under the Clean Growth Strategy, published in October 2017, are delivered in full.⁴²

Moreover, the CCC produces recommendations in much greater detail than a lump-sum estimate of investment needs. Its briefing note of March 2017 identified six target areas for investment in infrastructure, with a view to reducing emissions but also adaptation spending to ensure resilience against climate change. Couched in terms of the carbon budgets and the 2050 target, the committee pointed to smart low-carbon power, electric vehicle charging networks, heating, carbon capture and storage, flood risk management and drainage, and water resource management and supply.⁴³

Ultimately, the case for a green Bank of England is that its concern for financial stability looks incoherent unless it takes into account the long-term viability of the economy. To mitigate risk in the long run, a successful transition to low-carbon alternatives and resilient infrastructure is necessary. The longer investment levels remain insufficient, the greater the long-term costs and the corresponding shock in the case of failure. The current financial system is poorly equipped to meet this challenge. Central banks have a public, even moral, duty to intervene. Why aren't they doing so?

CHAPTER 2:

THE BANK OF ENGLAND AND CLIMATE SUSTAINABILITY

To understand the barriers to change at the Bank of England, those policies the central bank has adopted deserve a fair hearing. The Bank is not unfamiliar with the arguments presented above; researchers and policymakers in the UK have been at the frontier of climate finance, promoting the green central banking agenda in documents and speeches.

However, the current situation is heavy on talk and light on action. Meanwhile, in recent years, the Bank's unconventional monetary policy has financed fossil fuel industries. The Bank therefore has some way to go to be truly green.

2.1 Climate change work at the Bank of England

The Bank of England has been forthright on the relevance of climate risk to the financial sector. Many attribute growing mainstream awareness of the subject to a speech given by Governor Carney in 2015. That speech introduced the 'tragedy of the horizons', the idea that 'the catastrophic impacts of climate change will be felt beyond the traditional horizons of most actors.' Critically, this includes 'technocratic authorities':

“ ‘The horizon for monetary policy extends out to 2-3 years. For financial stability it is a bit longer, but typically only to the outer boundaries of the credit cycle – about a decade.’⁴⁴

Both time horizons fall short of the time period – measured in decades – over which the most serious effects of climate change will be felt.

Nevertheless, the Bank has established a ‘Climate Hub’ nested in the Prudential Regulation Authority (PRA), its supervisory and regulatory body. The Bank’s policies – to the extent that they are publicly visible – were laid out in an article in the Bank’s Quarterly Bulletin (QB) in Q2 2017.⁴⁵ The Bank’s official response is described in two aspects:

1. ‘engaging with regulated firms on climate-related risks through prudential supervision’
- and
2. ‘enhancing the resilience of the UK financial system by engaging with initiatives to support an orderly market transition to a lower-carbon economy.’

Initial work on climate change came under the first aspect, with a review of the insurance sector in the UK. The resultant report was published as part of the PRA’s participation in the second round of climate change adaptation reporting for the Department of Environment and Rural Affairs.⁴⁶ Physical risks are likely to bear heavily on the sector as the climate crisis worsens. Yet transition risks also have an impact, through firms’ investments in carbon-intensive assets and lower insurance premia from carbon-intensive sectors. Rapid changes in investor sentiment or market expectations due to awareness of future, as yet unrealised, climate risks could have an impact in the near term. This form of ‘unhedgeable risk’⁴⁷ should again raise the question of stability at the systemic level.

For the third round of adaptation reporting, the PRA is due to publish a similar review into the UK banking sector. Given the scale of carbon-intensive bank loans identified in section 1.1, the final report will merit close scrutiny.

All of this work is limited to the realm of supervision and therefore falls under the first area outlined by the QB article in Q2 2017. As far as the second aspect is concerned, the Bank is taking no unilateral action. However, it participates in several joint projects, both at home and abroad, that work to this end. Those taking place on the domestic front, themselves a function of political decisions made by HM Government, will be described in chapter 3.

INTERNATIONAL WORK

The Bank of England is part of several international initiatives, two of which are listed in the QB article.

The first is the G20 Green Finance Study Group, which published its final report at the end of 2017. The UK co-chaired this research initiative with China, which held

the year-long presidency of the G20 during 2016. The Group's stated goal was to 'identify institutional and market barriers to green finance, and based on country experiences, develop options on how to enhance the ability of the financial system to mobilize private capital for green investment.'⁴⁸

The Group produced a list of seven 'options' where authorities could do more to advance sustainable finance; a scoring carried out by the United Nations Environment Programme (UNEP) in July 2017 showed the UK has 'examples of green finance innovation' in six out of the seven areas:

1. provide strategic policy signals and frameworks;
2. expand learning networks for capacity building;
3. support the development of local green bond markets;
4. promote international collaboration to facilitate cross-border investment in green bonds;
5. encourage and facilitate knowledge sharing on environmental and financial risk;
6. improve the measurement of green finance activities and their impacts;

with the task of 'promoting voluntary principles for green finance' its only area of weakness. The Bank of England is credited for progress in areas 2 and 5.⁴⁹

Secondly, in December 2016 the PRA joined with insurance regulators from multiple jurisdictions to establish the Sustainable Insurance Forum. This international network of insurance supervisors and regulators is designed to enable collaboration on critical sustainability issues, including climate change, by developing new tools and methodologies for the global insurance sector. It fits into a broader trend of a preference for establishing networks for knowledge-sharing prior to taking any concrete policy action.

Finally, the Bank of England is also a founding member of the Central Banks and Supervisors Network for Greening the Financial System. The Network, announced in December 2017, is not a platform for making binding policy, instead serving to 'exchange views and best practices.'⁵⁰ Its initial meeting in January was followed by a conference in April 2018. The Bank of England's influence in this network should be viewed as an incentive to innovate with policy and an opportunity to guide the direction of green central banking practice globally.

Though the UK's strong performance relative to other G20 nations (on the terms set by the Study Group) deserves credit, clearly, study groups and networks do not equate to material change. The Bank's climate leadership is mostly in terms of its research and public stance on the issue. On policy, it does much less than some central banks in emerging and developing nations. However, as will become clear in chapter 4, there is a rationale for arranging lines of cooperation, both with different domestic stakeholders and other regulators abroad, before enacting policy.

2.2 Monetary policy has harmed the climate

In his 2015 speech, Mark Carney addressed time horizons for both of the Bank's functions: monetary policy and safeguarding financial stability. However, all the policies and initiatives discussed above relate to the latter. What can be said about the Bank's monetary policy through a climate lens?

The set-up of the Climate Hub within the PRA seems to imply that environmental concerns are siloed within the domain of financial regulation. Publicly at least, the monetary policy process is insulated from any reflection on climate change. Monetary policy since the 2007-08 financial crisis has been characterised by extremely low interest rates and a vast asset purchase programme known as 'quantitative easing' (QE). The Bank of England's balance sheet has swelled to an unprecedented size.⁵¹ In 2016 the Bank launched its corporate bond purchase scheme (CBPS) as part of the wider QE programme.

Research conducted by the Grantham Research Institute on Climate Change and the Environment has shown how monetary policy since the crisis has been actively harmful for the climate.⁵² A sectoral analysis of the corporate bond purchase programmes operated by the Bank of England (the CBPS) and the European Central Bank finds they were skewed towards high-carbon sectors.

When the CBPS eligibility criteria are applied to the universe of corporate bonds, the resultant distribution is disproportionately favourable to firms in energy-intensive sectors, such as manufacturing and utilities. Those sectors accounted for more purchases than if the scheme had bought bonds from each sector proportionate to its contribution to national gross value added (GVA). The authors write:

“ ‘For the Bank of England, manufacturing and electricity production – responsible for 52 per cent of UK emissions – make-up 49.2 per cent of the eligible benchmark, but only 11.8 per cent of GVA.’⁵³

Purchases in the energy sector have been restricted to oil and gas companies only, and none at all from renewable energy providers, due to the nature of the eligibility criteria. Moreover, the very choice of a bond-purchasing programme as a monetary policy instrument in the first place creates a bias against many economic agents from participating – such as those firms not large enough to issue debt. Table 1 shows the effect of the eligibility criteria on the volume of bond purchases in each sector. Figure 3 arrays the volume of purchases by sector (using a different sectoral classification), by gross value added to the UK economy.

1: BICS sector classification name	2: All sterling corporate bonds (%)	3: All corporate bonds except finance (%)	4: All corporate bonds of eligible maturity (%)	5: Investment grade corporate bonds of eligible maturity (%)	6: CBPS-eligible (%)	7: Bank of England benchmark list of eligible bonds (%)
Communications	8.64	14.29	13.15	12.48	12.89	12.23
Consumer discretionary	11.31	18.71	18.49	13.10	13.32	10.83
<i>Car/automobile manufacturing</i>	2.55	4.22	3.44	3.37	3.46	3.42
Consumer staples	5.42	8.96	8.88	7.98	8.09	10.50
<i>Food & beverage</i>	1.67	2.76	2.62	2.38	2.30	1.72
Energy	2.23	3.70	3.59	3.68	3.81	2.95
<i>Integrated oils</i>	1.35	2.24	2.28	2.33	2.42	1.83
<i>Renewable energy</i>	0.02	0.03	0.03	0.00	0.00	0.00
Financials*	46.89	12.11	12.55	11.13	11.06	6.60
Government**	0.00	0.00	0.00	0.00	0.00	2.80
Health care	2.48	4.10	4.30	4.48	4.54	5.85
Industrials	5.02	8.31	8.58	9.71	9.71	6.15
Materials	1.26	2.08	1.86	2.31	2.40	1.20
Technology	0.51	0.85	0.87	1.14	1.18	1.46
Utilities	16.25	26.89	27.73	33.99	33.00	39.44

Table 1: Successive eligibility criteria applied to the total universe of sterling corporate bonds distort the distribution of purchases under the Corporate Bond Purchase Scheme.

Share of total amount outstanding, by Bloomberg Industrial Classification System sector.

*Financial institutions under supervision are excluded but other financial actors are eligible.

**Column 7 is based on the list of eligible international securities identification numbers provided by the Bank of England, includes government-backed entities such as Transport for London, while the authors base columns 1-6 on search results retrieved from a Bloomberg terminal.

Source: Matikainen et al. 2017⁵⁴

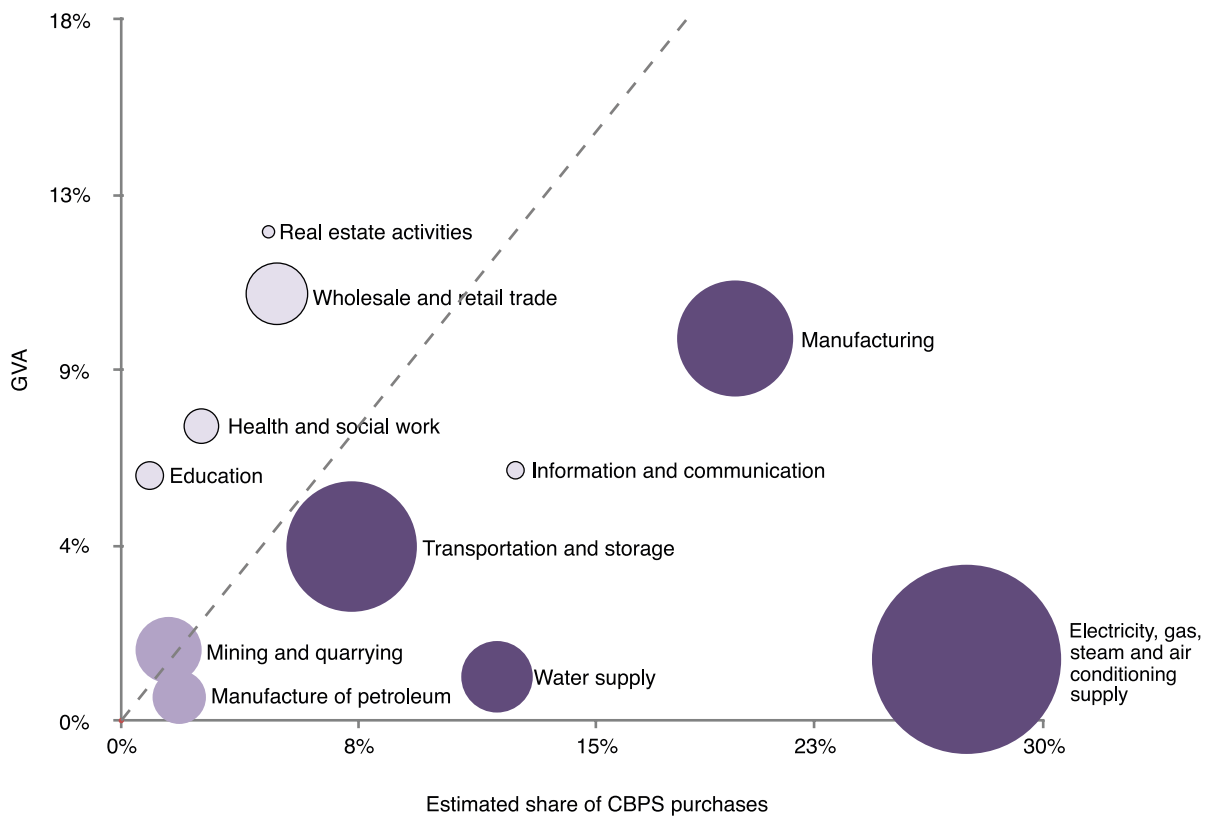


Figure 3: The proportion of assets bought under the Corporate Bond Purchase Scheme from high-carbon sectors (large circles) has been greater than would be proportionate to their gross value added (GVA) to the UK economy.

Size of bubble represents intensity of carbon emissions of each sector. Sectors are classified according to Eurostat NACE scheme. Darker bubbles represent more carbon intensive sectors while lighter represent less intensive. Dashed line represents a sectoral share of CBPS purchases proportionate to GVA.

Source: Matikainen et al. 2017⁵⁵

One of the main transmission ‘channels’ through which QE is supposed to provide stimulus is via lower interest rates – ‘yields’ – on bonds.⁵⁶ As central bank purchases bid up the price of bonds (meaning their yield falls), governments and companies should be encouraged to issue new debt. Indeed, the Bank reported that the announcement of the CBPS was followed by an uptick in issuance in the sterling corporate bond markets.⁵⁷ If this increased issuance follows the distribution of carbon intensity shown in the analysis, it will have had negative environmental consequences. In short, monetary policy is incoherent with the Bank’s wider effort to protect financial stability from climate change.

It is worth reflecting that as well as this skew towards fossil fuel companies in the £10 billion CBPS, the £435 billion of government bonds that the Bank purchased on the secondary market – that is, from banks and other actors in financial markets, rather than from the government directly – flowed into the wider financial system, which we know to be heavily invested in carbon-intensive sectors, as described in section 1.1. Without any guarantee that the proceeds from gilt issuance will be put to climate-positive use, conventional (non-corporate) QE may also be indirectly harmful to decarbonisation efforts.

THE MOOTED LEGITIMACY OF CLIMATE-FRIENDLY MONETARY POLICY

Monetary policy is a hotly contested battleground in the effort to make central banks greener. For instance, one central banker at a conference at Der Nederlandsche Bank in late 2017 contended that monetary policy is not an appropriate tool with which to address the climate crisis. This contention was expressed as a worry over the legitimacy of monetary policy decisions.⁵⁸ Smoothing and accelerating the low-carbon transition will have distributional implications, which central bankers fear will go outside their legitimate remit as unelected officials. This fear sharpens in light of criticism claiming that central banks – especially through expansionary policy since the crisis – have contributed to worsening inequality.⁵⁹

This argument draws a false dichotomy between partisan climate-positive action and the neutral status quo. The Grantham Research Institute findings on the CSPP highlight the problem with this reasoning. The purported ‘neutrality’ of current policy is a mirage: all instruments necessarily favour one sector of the economy or another by their very design. All monetary policy interventions have fiscal consequences. It is a political question to design the remit so as to produce the most desirable of those consequences.

However, that some raise questions over the legitimacy of a green central bank reveals that the remit for monetary policy – as part of the broader central bank mandate – is of undeniable importance.

2.3 The Bank of England’s mandate

Unsurprisingly, policymakers at the Bank see climate change through the prism of its mandate. As Sarah Breeden, Executive Director for International Banks Supervision at the PRA, wrote in a letter to the Chair of the Environmental Audit Committee, the Bank’s work ‘is focused on those issues relevant to advancing our statutory objectives for monetary and financial stability.’⁶⁰

In a UNEP paper discussing central banks and green finance, Volz raises the importance of the mandate in shaping the way policymakers in monetary institutions understand their role:

“ ‘The current generation of central bankers has been trained to think in a framework that gives little room to objectives other than macroeconomic and maybe financial stability... The path-dependent nature of institutional change, which includes also cultural patterns, requires that institutional traditions are taken care of so that resistance to change does not undermine attempts at institutional redesign.’⁶¹

In short, reforms for climate sustainability need to sit neatly with ‘institutional tradition’ or else will be rejected. The following scrutinises the British tradition of independent central banking through a climate lens.

THE 1998 BANK OF ENGLAND ACT

British monetary policy was transformed in 1998 by the Bank of England Act, which granted the Bank its legal (operational) independence and set its goals:

‘In relation to monetary policy, the objectives of the Bank of England shall be—

- A.** to maintain price stability, and
- B.** subject to that, to support the economic policy of Her Majesty’s Government, including its objectives for growth and employment.’⁶²

However, the Chancellor of the Exchequer retains significant influence, as the Act goes on to specify:

‘The Treasury may by notice in writing to the Bank specify for the purposes of section 11—

- A.** what price stability is to be taken to consist of, or
- B.** what the economic policy of Her Majesty’s Government is to be taken to be.’

Therefore, under the current mandate *sustainability can be an objective for the central bank if the government chooses to make it one*. But even then, the pursuit of price stability will take pride of place. The government’s objective in early 2018 is ‘strong, sustainable and balanced growth.’⁶³ The nature of the ‘sustainability’ the Chancellor has in mind is not made explicit.

The Chancellor currently defines price stability as an inflation rate of 2 per cent and the Monetary Policy Committee (MPC) makes its decisions with a view to achieving this target.⁶⁴ However, instrument independence affords more flexibility than it might seem. Policymakers have justified expansionary policy since the 2007-08 crisis with reference to the Bank’s attempt to ensure the stability of prices. For example, during the press conference for February 2018’s Inflation Report, an exchange between Bank of England Governor Mark Carney and Larry Elliott of The Guardian ran as follows:

Elliott: Effectively, is what you’re saying that the bank is done here, that we are entering a different era where you’ve done all you can on the demand-side in terms of providing stimulus, and now you’re actually looking more... to keep inflation low rather than to support the economy?

Carney: Well, just to be clear, we’re providing support in order to get inflation sustainably to target. In exceptional circumstances we’ve brought in that horizon, as you know, and now we think that that horizon’s going to start to come in as we’ve used up the slack. I think we should remember that, even over this forecast, and even with some modest adjustment of policy, we are still likely to be providing important support.⁶⁵

Low rates and QE were intended to support output as a means of getting inflation to target over a path of several years. There is therefore a recent precedent at the Bank for an inventive and innovative use of monetary policy, so long as it is consistent with the medium-run pursuit of stable prices.

Furthermore, objectives don't always align, and the MPC is accustomed to making trade-offs when deciding on policy. The monetary policy remit requires the Committee to:

“ ‘promote an understanding of the trade-offs inherent in setting monetary policy to meet a forward-looking inflation target while giving due consideration to output volatility. It should set out in its communication:

- the outlook for inflation and, if relevant, the reasons why inflation has moved away from the target or is expected to move away from the target;
- the policy action the Committee is taking in response;
- the horizon over which the Committee judges it is appropriate to return inflation to the target;
- the trade-off that has been made with regard to inflation and output variability in determining the scale and duration of any expected deviation of inflation from the target; and
- how this approach meets the government's monetary policy objectives.’⁶⁶

This model of behaviour for the MPC – recognising trade-offs, publishing analysis, and ultimately responding to the specific macroeconomic context – is critical as a precedent for reforming the Bank for climate sustainability. The FPC, examined below, is also required to address trade-offs in making its decisions and to communicate them ‘transparently and consistently with the Committee's assessment of the costs and benefits of its actions.’⁶⁷

FINANCIAL STABILITY

The 1998 reforms introduced the ‘tripartite’ model for macroeconomic management. While the Bank gained operational control over monetary policy, most of its responsibilities for ensuring financial stability were moved to the newly created Financial Services Authority (FSA). The deficiencies in this model were exposed by the 2007-08 financial crisis, which prompted a wave of reform across advanced economies that included central banks in its scope. The 2012 Financial Services Act amended the 1998 act to return responsibility for financial stability to the Bank:

“ ‘An objective of the Bank shall be to [protect and enhance] the stability of the financial [system] of the United Kingdom.’⁶⁸

A complication is that the stability of the financial system is within the purview of two separate entities within the Bank. The PRA supervises financial firms and conducts

the regulatory process, while the Financial Policy Committee (FPC) is tasked with monitoring systemic risk. For reference, Figure 4 shows the key institutions that make up and influence the Bank of England alongside the Committee on Climate Change, displaying the most relevant piece of legislation and the mandate and policy tools assigned to each.

Relevant government depts.:	BEIS* DEFRA**	HM Treasury		
Institution:	Committee on Climate Change Adaptation Sub-Committee	Bank of England Monetary Policy Committee Financial Policy Committee Prudential Regulation Authority Prudential Regulation Committee		
Description:	independent advisory board	polycymaking board	polycymaking board	supervisor & regulator
Main legislation:	Climate Change Act 2008	Bank of England Act 1998	Financial Services Act 2012	Financial Services Act 2012
Mandate:	advise on level of 2050 target for net UK carbon account; advise on carbon budget for each period and on meeting the budget through emission reductions or credits; report each year on progress towards budgets and National Adaptation Programme	maintain price stability; subject to that, support the economic policy of HMG	contribute to Financial Stability Objective; subject to that, supporting the economic policy of HMG (in particular, identifying, monitoring, and taking action to remove systemic risks)	promote safety and soundness and... avoid any adverse effect on the stability of the UK financial system from business or failure of PRA-authorized persons;
Tools:	-	base rate; asset purchases; forward guidance	direct PRA or Financial Conduct Authority on macroprudential measures	reporting; supervision; stress testing; penalties, censures, suspensions

Figure 4: The Bank of England and its constituent parts, like the Committee on Climate Change, is an independent institution tasked with addressing an area of policy – although the two have very different functions and powers.

*Department for Business, Energy and Industrial Strategy

**Department for Environment, Food and Rural Affairs

Source: Positive Money

The FPC is required to keep an eye on the stability of the UK’s financial system, with a particular view to *systemic risk*:

“ ‘The responsibility of the Committee in relation to the achievement by the Bank of the Financial Stability Objective relates primarily to the identification of, monitoring of, and taking of action to remove or reduce, systemic risks with a view to protecting and enhancing the resilience of the UK financial system.

Those systemic risks include, in particular—

- A.** *systemic risks attributable to structural features of financial markets, such as connections between financial institutions,*
- B.** systemic risks attributable to the distribution of risk within the financial sector, and
- C.** unsustainable levels of leverage, debt or credit growth.⁶⁹
(emphasis added)

The Bank does not interpret the present level of climate risk as a fully-fledged systemic risk. The FPC discussed the issue in its meeting in March 2015, but has yet to do so since. It argued that:

“ [climate-related] risks to financial stability were likely to be beyond the FPC’s typical policy horizon... Committee members supported the intention for Bank staff to do more analysis on the risks in this area.⁷⁰

This stance is probably untenable in the medium term. As argued in section 1.1, the interconnections between financial institutions and firms in the macroeconomy have the potential to magnify severe physical damage into a systemic issue. The same applies to second-round effects on the banking sector and the wider economy from dramatic changes due to the low-carbon transition. Moreover, the right of commercial banks to create money when they lend is a ‘structural feature’ of financial markets, which, as section A. in the quoted text above shows, the FPC is responsible for monitoring and regulating. The FPC should consider how this factor behind the market failure in credit allocation contributes to climate change. Climate risk demands a macroprudential perspective, not just supervision and intervention at the micro (firm) level.

Provisions exist in the mandate for the MPC and FPC to cooperate.⁷¹ Therefore, it may be partly due to the FPC’s neglect of the climate issue that the MPC has made decisions with negative environmental consequences.

Because of the problems identified in section 1.1, the current financial stability objective – with its focus on the near-term – may well be insufficient to achieve the pace of decarbonisation needed. As Mark Carney noted in a speech at the International Climate Risk Conference for Supervisors:

“ ‘Once climate change becomes a clear and present danger to financial stability it may already be too late to stabilise the atmosphere at two degrees.’⁷²

Given its current mandate, the Bank is right to interpret its function through that lens. It is therefore down to Parliament to give the institution wider priorities on climate change. Failure to do so is a political choice that hinders efforts to meet the carbon budgets. Decarbonisation is legally required by UK law and democratic decision-makers must empower the Bank to help achieve it. In particular, the MPC must be equipped to take account of the climate crisis in its monetary policy decisions without relying on the FPC.

CHAPTER 3:

THE GROWTH OF GREEN FINANCE

If the central bank mandate represents the institutional context for green reforms, another form of context also matters: the condition of 'green' financial markets. Two developments on this front are relevant to the UK. Here we address the Task Force for Climate-Related Financial Disclosures (TCFD) and governmental initiatives to expand green finance.

3.1 Financial disclosures: no panacea

The TCFD has been the leading initiative globally aiming to change financial and corporate practice since the Paris Agreement in 2015. It addresses the information gap investors face with respect to climate risks. The final report, published in June 2017, calls for all companies to recognise the risk to their business from climate factors, publish their assessment, and outline their corresponding strategy. The rationale is to provide 'better information to support informed investment, lending, and insurance underwriting decisions and improve understanding and analysis of climate-related risks and opportunities.'⁷³ Ultimately, the recommendations should result in more climate-positive lending – in theory, with full information, at a socially optimal level.

The Bank of England's Quarterly Bulletin article from Q2 2017 on climate change described the Bank 'taking a close interest' in the TCFD. Since being published the recommendations have received the public support of over 250 companies (as of April 2018)⁷⁴, and both the Bank and the UK government have endorsed their uptake by firms on a voluntary basis.

However, it is highly unlikely that voluntary disclosure will be sufficient to generate the required investment. Voluntary action is good at producing market leaders, but poor at hurrying laggards. And leadership on disclosure doesn't necessarily translate to concrete action. BankTrack has questioned the TCFD's failure to recommend that banks assess or even reduce financed emissions (i.e. CO₂e emissions attributable to finance they provide through loans and investments). In fact, none of the first banks to lend their support to the recommendations were among those that had ended their project financing for new coal mines or coal power plants worldwide.⁷⁵

On a technical level, for disclosure to translate into meaningful change, investors need to be able to interpret the information and make comparisons. This means that disclosure needs to be widespread and consistent in format. Reductions in emissions also depend on the quality of the information disclosed, with research finding that common management practices to increase information do not necessarily produce the desired results.⁷⁶

Giving oral evidence to the Environmental Audit Committee, Sarah Breeden, Executive Director at the PRA, outlined the Bank's opinion on TCFD implementation. Arguing that businesses currently lack the expertise to conduct good forward-looking scenario analysis, Breeden proposed:

“ ‘a period of experimentation, where we work out what good looks like and where we get the climate scientists working with the firms to work out what is meaningful disclosure... For mandatory to be useful it needs to be specific. We need time to make it specific.’⁷⁷

Yet mandatory guidelines for disclosure, refined and standardised by a regulator, could play a role in achieving this specificity faster than the market left to its own devices.⁷⁸ For instance, there is an argument for requiring firms to disclose the assumptions used in their scenarios or models, as well as the financial results. Here, the Bank could cooperate with the Financial Reporting Council to issue a unified set of reporting guidelines. It might also seek to coordinate a multi-stakeholder platform of regulatory bodies, industry, and even organisations from civil society to establish a comprehensive framework with widespread support. An example of the sort of initiative the Bank of England could lead is the Platform Carbon Accounting Financials, a group of 11 Dutch financial organisations cooperating to develop open source methodologies to measure the carbon footprint of their investments and loans.

Finally, as we argue in section 4.1, the logic of the TCFD applied to the central bank itself means the Bank should disclose the climate risks on its own balance sheet.

There is international precedent for mandatory disclosure. In France, Article 173 of the Energy Transition Law requires investors to report their policies for meeting environmental, social, and governance concerns, as well as for achieving the energy transition and meeting national carbon budgets.⁷⁹ ShareAction's report on European banks argues that French banks' relatively strong performance on climate-related risks and opportunities is at least in part due to this legislation.⁸⁰ Until regulatory bodies in the UK take an active stance, the TCFD recommendations are unlikely to prove a watershed in climate-positive investment.

More generally, the theory that more information will result in socially optimal investing dramatically underestimates the difficulty of modelling and investing in the face of deep climate uncertainty. Short-termism in analysis and decisions on the investor side may well continue to drive carbon-intensive lending. Tackling the climate crisis is too important to be left to such a gamble.⁸¹

3.2 Green finance in the UK: advances and limitations

The UK government is striving to achieve ‘global leadership in green finance.’⁸² As part and parcel of the Clean Growth Strategy, ministers are examining a range of policy levers and interventions to grow the offering of climate-positive financial products in the country’s financial centres, especially the City of London. The aim is to strengthen what is already a position of leadership: in early 2018 London ranked first in a global index of green financial centres.⁸³

The City of London Corporation itself has launched an industry-led market development group known as the Green Finance Initiative. As of the end of March 2018, 38 green companies had collectively raised £10 billion, including renewable investment funds.

Much of the excitement is generated by the bond market, where ‘green bonds’ are growing in significance. The Clean Growth Strategy proudly exhibits London’s green bond offering:

“ ‘The first offshore green bond issued by an Indian entity and the first green bond issued by a Chinese bank were listed on the London Stock Exchange and 50 green bonds denominated in seven currencies with a value of \$14.8 billion are now listed in the UK.’⁸⁴

These numbers rise each month. Yet the total volume of green bonds globally, though growing, is still minute compared to the total bond universe. Total green bond issuance in 2017 was \$155.5 billion, a 78 per cent growth on 2016 that brought the total volume outstanding to over \$0.9 trillion;⁸⁵ globally, the total bond market stands at over \$90 trillion.⁸⁶

Major challenges remain for green bonds, including standardisation. It is unlikely that industry self-regulation on what counts as ‘green’ will work in the long run, so publicly issued standards are needed. Even with standards, there remains the threat of ‘greenwashing’, when supposedly ‘green’ bonds see the proceeds go towards activity with a high carbon intensity – for instance, renovating a coal plant with new equipment that reduces emissions slightly but extends the life of the facility. Another challenge, reflected in the discussion of the Bank of England’s QE programme, is that many green financial instruments don’t have a sufficiently high credit rating or other properties necessary to attract investors. Only \$389 billion of the total green bond universe ‘meets basic investment parameters’ of liquidity, sufficient size, and comparable currency.⁸⁷

Although the green bond market cannot overcome the climate crisis on its own, its growth offers an opportunity for green central banking. As a starting point for further

progress, UK public institutions could issue more of their own green bonds. France issued several billions worth of public green bonds in 2017 (see Table 2).⁸⁸ Greater public issuance could open the door to cooperation with the central bank through unconventional monetary policy, as the final chapter will argue.

Largest issuers to date	Amount (billion USD)	Issuer type	Country
EIB	22.6	Development bank	Supranational
KfW	12.8	Development bank	Supranational
World Bank	10.6	Development bank	Supranational
SPD Bank	7.6	Commercial bank	China
Republic of France	7.6	Sovereign	France
...			
HM Government	0.0	Sovereign	UK

Table 2: The UK government has yet to issue a green sovereign bond, putting it well behind other national, supra-national and sub-national green bond issuers.

Data as of end June 2017

Source: Climate Bonds Initiative, 2017.⁸⁹

THE GREEN FINANCE TASKFORCE

Launched in October 2017, the Green Finance Taskforce comprises experts drawn from policymaking and regulatory bodies, the finance sector, academia, and civil society. Its stated purpose was to grow green finance to ‘help deliver the investment required to meet the UK’s carbon reduction targets.’⁹⁰ It was given 6 months to produce its assessment and published its final report in March 2018. Its recommendations (which include green sovereign bond issuance and TCFD implementation) do not address central banking directly, but many of its recommendations offer scope for the Bank of England to adopt complementary policies.⁹¹

The UK government’s stance sees green finance as a growth industry and an opportunity for business first, and as part of the necessary fight against climate change second. This stance is evident in the total absence of shifting funds away from fossil fuels and other carbon-intensive lending from the Terms of Reference for the Green Finance Taskforce. The final report compares the size of the market in green finance to the scale of oil and gas investment, but only to highlight the need for more green, not less brown.⁹²

Industry and power account for 17 per cent and 21 per cent of UK CO₂e emissions respectively.⁹³ In order to meet reduction targets, carbon-intensive firms in these sectors need to switch equipment and processes. In many cases where this is not possible due to ‘carbon lock-in’ of infrastructure, such ‘dirty’ activity simply cannot continue.

The UK's economic institutions are not always committed to environmental standards. An inquiry by the Environmental Audit Committee in 2016 examined the record of HM Treasury in relation to environmental goals and policies, finding that 'the Treasury has ridden roughshod over other departments' objectives' and that it uses 'technical and political frameworks [that] consistently favour short-term priorities over long-term sustainability.'⁹⁴

The lesson is that for successful decarbonisation, alignment across public institutions is crucial. The Bank of England is no exception, given the importance of its duties and influence on the UK economy. The next chapter turns to the reforms that would make that alignment a reality.

CHAPTER 4:

A VISION OF A GREEN BANK OF ENGLAND

What do climate-positive central bank policies look like? And which could the Bank of England adopt? Three areas are ripe for intervention: shaping the market for green securities, applying macroprudential regulation to lending on the basis of climate risk, and deploying monetary policy to support green public and private investment. Given the importance of legitimacy and the mandate, we also explore which political interventions could enable – or enforce – these policies.

The position in this paper does not reject operational central bank independence. But it is in line with those who argue that a much greater degree of coordination between public institutions, in particular monetary and fiscal policymakers, is needed to tackle particular economic challenges.⁹⁵ The climate crisis is one such challenge, just as the banking crisis and liquidity trap of the late 2000s was another.

4.1: Structuring green finance markets

The UNEP progress report on the G20 Study Group's seven options points to the UK's support for its local green bond market. This is largely thanks to the London Stock Exchange (LSE) and has little to do with the Bank of England. The LSE has issued green bond guidelines and listed international securities on its exchange (including from China and India). Guidelines are necessary to prevent greenwashing, and the LSE – as a neutral institution with no conflict of interest – is an excellent middleman between issuer and investor.

However, an area where the UK falls behind some G20 nations is in promoting principles for green finance more broadly. These would encompass green lending rather than just securities. As we have seen, the TCFD has altered the state of play on climate investing. But even with greater disclosure by firms, it does not follow that the market will reach a common understanding of which investment decisions are green and which aren't. The Green Finance Taskforce report recognises that:

“ ‘while the market for green bonds remains relatively sophisticated, this is not true for loans and asset-backed securities and there is little in the way of common standards in green corporate lending, real estate or securitisation, either domestically or internationally.’⁹⁶

If green bonds and loans are to become globally traded assets, global standards will be required. The Bank of England can use its leadership of the G20 Green Finance Study Group in this area. But a trade-off arises between the quality of guidelines and rapid convergence across nations. For example, some have voiced concerns that the China Banking Regulatory Commission (CBRC)'s Green Credit Guidelines aren't stringent enough.⁹⁷ If disagreement stalls international progress, **the Bank should publish its own green lending guidelines for commercial banks to ensure the UK's growing green finance offering brings genuine environmental benefits.**

Disclosure remains crucial. As a financial institution serving the public interest, the central bank should lead by example. Currently, the Bank fails to follow the same logic on climate-related financial risk that it has publicly endorsed in the form of the TCFD recommendations. And evidence on its Corporate Bond Purchase Scheme suggests that its investments are far from sustainable. **The Bank should disclose the climate risk of the assets on its balance sheet** – including those purchased through QE and all the investments it makes through its regular operations. As prominent public institutions and hubs of the financial economy, central banks are strategically placed to develop best practice on disclosure.

Ultimately, however, the Bank of England has far more powerful resources at its command to affect both lending and bond issuance in the form of regulation and monetary policy.

4.2: Green macroprudential regulation

Interviews conducted with officials suggest that one of the most significant steps taken so far by the Bank has been to broadcast its regulatory interest in the climate question. Communication from the Chief Executive of the PRA to reporting institutions has the potential to kick-start private action on making investment sustainable. It bears repeating that the Bank's public leadership in the climate space is to be applauded.

However, by packaging the Climate Hub into the PRA, the Bank of England has so far failed to fully recognise climate risk as a systemic issue. As we have argued, the market failure in credit allocation resulting from the power of commercial banks to create new money is a structural, systemic feature of finance and contributes to the sector's harmful effect on the climate. Seen in this light, macroprudential regulation – the prerogative of the FPC – is the appropriate policy tool.

Climate-related financial regulation has drawn attention at the European level. In late 2017, the European Commission stated an interest in altering capital requirements to address climate risk. The specific claim, made by EC Vice-President Valdis Dombrovskis, was that the Commission was ‘looking positively at the European Parliament’s proposal to amend capital charges for banks to boost green investments and loans by introducing a so-called green supporting factor’ (GSF). The factor would imply lower capital requirements on loans to climate-friendly investments, like ‘green mortgages’.⁹⁸

As others have pointed out, the GSF is a flawed proposal that may increase the level of risk in the financial system, while offering uncertain benefits.⁹⁹ First, lowering the amount of capital that banks hold reduces their resilience to macroeconomic shocks.¹⁰⁰ Secondly, green assets can still be very risky despite contributing to easing systemic climate risk. A lower level of climate-related risk system-wide could be outweighed by, for instance, excessive lending to systemically risky activities like mortgages, the consequences of which were all too clear in the 2007-08 crisis. Finally, picking out a ‘green’ category for special treatment would incentivise greenwashing more than a converse policy of penalising those with high carbon emissions.

A more effective policy would be a ‘brown penalising factor’, which the EU’s High Level Expert Group on Sustainable Finance (HLEG) originally argued would ‘yield a constellation in which risk and policy considerations go in the same direction.’¹⁰¹ As van Lerven and Ryan-Collins write, such a policy might be a ‘win-win’, shoring up banks’ capital against shocks while offering a relative incentive to make green loans.¹⁰² Crucially, the regulation is justified on the grounds of differences between asset classes in terms of risk, but with welcome allocational side-effects.

For the Bank of England specifically, questions of financial regulation are muddled by the Brexit process and discussions over ‘regulatory alignment’ with the EU. Capital requirements currently stem from the EU’s Capital Requirements Directive. However, there is much that can be done in the immediate term, building on the Bank’s leadership in international knowledge and experience-sharing networks (like the Central Banks and Supervisors Network for Greening the Financial System).

A report by authors at the 2° Investing Initiative argues that stress tests are an inappropriate tool for addressing the profound, long-term types of risk caused by the low-carbon transition.¹⁰³ As Gramlich writes of traditional stress tests:

“ ‘The critical values for scenarios are obtained from looking at extreme values in the economic markets from the past. Even while this strengthens the empirical evidence of the stress tests, the underlying assumption is that future challenges may be replicated as a function of past experience... this assumption is more than critical.’¹⁰⁴

Instead, regulators need to develop a new methodology for interpreting climate change and risk. **The FPC should use its authority to promote work at the Bank on macroprudential risk-assessment tools to measure and regulate the climate risk companies and investors are exposed to.** This might begin with engaging the financial industry and civil society to develop a comprehensive scheme for

measuring and reporting financial institutions' carbon footprints, which can then form the basis for regulation.

4.3: Greening monetary policy

The question of using tests to assess the resilience of the financial system to climate change raises a larger problem. The backward-looking models monetary policymakers use are similarly ill-suited in light of the climate crisis, for which historical data are not a good guide to the future. The MPC uses macroeconomic models and prior experience to judge the impact of interest rate changes and the effect of unconventional instruments.

Clearly, then, the inherent unfamiliarity of climate change will affect modelling practices for monetary policymaking too, and the first step for reform is to equip the committee with the appropriate tools to make decisions. **Concurrent Bank research should also prioritise how to adapt the MPC decision-making process to build in the macroeconomic impact of the climate crisis.**

GREENING ASSET PURCHASES

We have seen in section 2.2 how QE programmes have likely been, on net, a hindrance rather than a help to decarbonisation efforts. Were the Bank of England to disclose the carbon intensity of its balance sheet and thereby the climate-related risk public funds are exposed to, this would surely start to change.

Removing the bias in favour of fossil fuels and energy-intensive industry would be one step towards greener monetary policy. To help fill the green investment gap, central banks could go further by prioritising sustainable investments in further asset purchases. In the near-term, unconventional monetary policy tools could simply be adapted so that bond purchases are first and foremost climate-friendly:

- 1. Green corporate bond purchases:** green bonds often do not meet the eligibility criteria for current QE programmes. But the growing green bond market in London will inevitably start to produce a wider variety of eligible bonds, with the OECD forecasting the 2020s as 'golden years' for bond issuance in low-carbon sectors.¹⁰⁵

The MPC could prioritise purchasing of these assets in any QE interventions over the coming years by screening bonds with ESG (environmental, sustainable and governance) criteria prior to making purchases. Preferential treatment for green bonds would simply reflect industry best practice in terms of sustainable investment, and some central banks (including the Swiss, Norwegian, and Dutch) already apply a form of ESG criteria to some investments.¹⁰⁶ **The Bank should no longer buy bonds issued by fossil fuel companies.**

A potential stumbling block is the 'green bond premium' indicated by some studies: green bonds issued by firms fetch a higher price (i.e. offer a lower yield) compared to a representative bond with the same characteristics but no

green credentials.¹⁰⁷ This hints at excess demand in the green bond market, suggesting that central bank intervention might fail to achieve the desired effect – lower yields and higher issuance – as the debt would be purchased by private actors anyway.

On the other hand, large-scale asset purchases might serve as an incentive for more issuance – with private firms more willing to issue debt knowing that the central bank is the buyer of last resort. Indeed, as discussed in section 2.2, corporate bond issuance increased following the announcement of the CBPS.

2. Green sovereign bond purchases: the UK is a laggard in terms of issuing public debt tied to green investment, with France and the United States being the major players in sovereign and sub-sovereign issuance respectively. Here, the central bank could cooperate with fiscal policymakers. The Green Finance Taskforce devoted an entire theme (out of 10 in total) in its final report to recommend that the UK government issue a sovereign green bond.

Such issuance would be effective if the government ‘makes clear that the proceeds amount to additional sources of capital, invested in new green projects that might otherwise not have been funded.’ Green infrastructure bonds of this sort can be securitised and sold on, with the proceeds recycled into further green projects. Government spending using the proceeds would also help crowd in private investment on projects with high risk or high initial sunk costs.¹⁰⁸

Just as with conventional (non-corporate) QE, the Bank of England could make large-scale purchases on the secondary market of green bonds issued by the UK government. This would reduce their cost, making further issuance more attractive (and offsetting the cost of green accreditation). Importantly, power over the destination of newly-created money would remain in the hands of the government, preserving democratic control over spending.

PRICE STABILITY

How would ‘green QE’ affect the Bank’s ability to achieve its primary objective? Would adding sustainability criteria ‘overburden’ monetary policymakers and make them less effective at achieving price stability?

The opposite may well be true. The standard transmission mechanism for monetary policy has broken down. Studies that model the mechanism suggest that the interest rate is a relatively weak tool for controlling inflation,¹⁰⁹ especially when nominal interest rates are near zero as they have been since the financial crisis.¹¹⁰

But conventional QE also has its problems for stimulating demand and generating inflation in a slump. As Sheng observes, ‘the assets that central banks hold affects the efficacy of the transmission mechanism of their policy tools. The more indirect the relationship with the real sector, the less effective the transmission tool.’¹¹¹ Government bonds purchased under QE have not been matched by increased government spending in a period of austerity. The creation of reserves to purchase bonds therefore relies on the financial sector as an intermediary to stimulate growth.

Moreover, the eligibility criteria used to screen corporate bonds for purchase have disqualified many assets from parts of the economy with the most productive potential. Placing the emphasis on flows to the green sector, where the scope for growth in jobs and incomes is substantial, would more directly boost aggregate demand.

SUPPORTING THE MACROECONOMY

Studies that attempt to model the impact of a green asset purchase programme suggest that the macroeconomic gains would be substantial. Dafermos et al. develop an ecological macroeconomic model that shows how a green corporate QE programme could reduce climate-induced financial instability and restrict global warming.¹¹² Their observation that QE takes on a prudential function reveals how the climate crisis connects monetary and financial policy - in the Bank of England's case, weighing on the MPC-FPC relationship.

Monasterolo and Raberto use a stock-flow consistent, flow-of-funds behavioural model to explore the benefits of sovereign green bond issuance.¹¹³ The result is a growth in the green bond market, increased green investment, and decreased exposure to stranded assets. However, assuming a division of households into 'worker' and 'capitalist' types, wealth inequality increases. The QE programme enriches the capitalist household that owns shares and bonds but passes over the worker household.

Undesirable side-effects on inequality might be avoided by a final, more radical option for green monetary policy, for which the transmission mechanism is more direct than QE:

- 3. Green overt monetary finance (OMF):** the central bank would buy zero-interest-bearing, perpetual bonds from HM Treasury to finance government deficit spending on green projects. Such a policy would best be used in a recession, where the stimulus from money finance is more certain than the impact of debt-financed deficit spending.¹¹⁴ This would reconcile support for prices with decarbonisation – and might well be necessary as the climate crisis sharpens. The OMF transmission mechanism would be more direct than QE since the financial sector no longer plays the role of intermediary.

Such an option is temporarily forbidden by Article 123 of the Lisbon Treaty. However, the UK's impending exit from the European Union makes the future of this provision uncertain. Unless the UK adopts parallel legislation, the legalistic objection to monetary finance will become redundant. Nevertheless, in the event it is explored, the use of monetary finance would need to be carefully controlled by institutional checks that protect the credibility and independence of the central bank.

In a recession, green monetary policy offers an opportunity to provide stimulus *and* assist decarbonisation. A QE or OMF programme could have a substantial, positive environmental impact if used appropriately. Its use would first require a detailed analysis of the macroeconomy, financial system and developments in the climate. Equipping the MPC with the tools to do so is therefore a precondition for green monetary policy.

GREENING PRIVATE CREDIT FLOWS

A final policy intervention in favour of climate mitigation and adaptation would see the central bank shape investment flows through credit guidance policies.

Several papers point to the active role central banks play in emerging or developing economies in directing green credit allocation through incentives. For instance, in Fujian Province in China, preferential interest rates are granted on green loans. The Bangladesh Bank extends a range of green refinancing lines to subsidise green lending, and even goes so far as to set mandatory quotas: commercial banks and non-bank financial institutions (NBFIs) are required to allocate 5 per cent of their total loan portfolio to green sectors.¹¹⁵

There is a good *a priori* case for a policy that supports incentives for banks and other financial actors to lend to the green sector. Capital that values sustainability in investments necessarily takes a long-term perspective. But since many green companies are smaller than their non-green peers they do not have equal access to finance through bond markets, making them more reliant on bank lending. This applies in particular to firms specialising in energy efficiency.¹¹⁶ Other technologies, like carbon capture and storage, are still perceived as risky and uncertain and struggle to attract investment.¹¹⁷ Up-front capital costs are also high for green energy projects, and have been estimated at 84–93 per cent of total project costs for wind, solar, and hydro energy (compared to 66–69 per cent for coal and 24–37 per cent for gas).¹¹⁸

On the face of it, credit guidance may well go outside the terrain prescribed by current institutional legacies at the Bank of England. While some central banks, including the Bank of England, operated some sort of credit guidance policy in the middle of the 20th century, the Bank's approach has always been more hands-off: 'the entire system of controls over reserves, liquidity and lending was based on moral suasion.'¹¹⁹ While this system came with the implicit prospect of punishment for deviant banks, it is a step removed from more interventionist policies of the same period, like the Bank of Japan's 'window guidance' or the state-directed French system inherited from Vichy-era reforms.¹²⁰

However, the structural imbalances in the market for credit are so pervasive that encouraging climate-positive lending to the real economy (including finance for adaptation, not just CO₂e emissions) may in the future require bolder measures than capital requirements. In fact, as some have argued,¹²¹ credit guidance rests on the same principle as the widespread use of macroprudential regulation since the financial crisis: the central bank favouring some forms of lending over others. The next generation of central bankers in the UK may find credit guidance a logical next step.

4.4. Mandate reform for the climate crisis

While the logic of the TCFD implies that the Bank of England should disclose the carbon intensity of its own balance sheet, going further and adopting green macroprudential or monetary policies would be harder under the current mandate, which makes no explicit reference to sustainability concerns.

Amendment to the Bank's mandate should aim to influence the behaviour of both the FPC and MPC and bolster their coordination on climate matters. Thankfully, the Chancellor of the Exchequer - an elected politician – makes recommendations to the FPC and decides the remit for both financial and monetary policy. Designing a climate-friendly central bank for the 21st century is fundamentally a political process.

RECOGNISING CLIMATE RISK AS SYSTEMIC

As argued in section 2.3, the FPC ought to understand that the market failure in credit – a function of commercial banks' privilege to create money – is a structural feature that results in socially suboptimal credit allocation. A build-up of climate risk will have consequences several years from now. If the Bank's pursuit of financial stability ignores this, it is unacceptably short-sighted.

The Chancellor of the Exchequer writes a letter, typically annually, to the Bank with the remit and recommendations for the FPC. The letter can draw attention to 'responsibilities in relation to support for the government's economic policy, as well as matters to which the Committee should have regard in exercising its functions.'¹²² This is a power granted to the Treasury by the 2012 Financial Services Act.¹²³

The recommendations made as part of the remit for the FPC should refer to 'environmental sustainability' under the heading of 'matters that the Financial Policy Committee should regard as relevant to the Bank's financial stability objective.' In fact, the letter from March 2017 already refers to another modern, relatively poorly-understood risk – cyber security – so the notion of the Chancellor highlighting a particular issue in this section of the letter should not seem controversial.

If the FPC remains uncertain over the systemic nature of climate risk, it should communicate its view of the trade-offs it faces in view of other objectives. This would further the debate on the correct role for green macroprudential regulation.

This modest reform would create an FPC that takes the lead on climate risk as a systemic issue. The Committee is well-placed to do this because, as the March 2017 letter recognises, the Bank of England Act 'provides the Committee with the power to give directions and also recommendations, including on a 'comply or explain' basis, to both the Prudential Regulation Authority and the Financial Conduct Authority.'¹²⁴ Finally, given its communication with the MPC, the FPC can feed into monetary policy decision-making as it builds a knowledge base on climate risk.

REVIEWING THE MONETARY POLICY FRAMEWORK

The carbon intensity of monetary policy since the 2007-08 crisis warrants a review of the Bank's approach, since its decisions have directly affected the pursuit of the carbon budgets mandated by the 2008 Climate Change Act. As CO₂e emissions are monitored by the Department for Business, Energy and Industrial Strategy (BEIS), it could act in concert with the Treasury (HMT) to take stock of this issue.

Independence acts as a cognitive and institutional lock on the nature of central banking. HMT and BEIS are unable to assess or comment on the impact of monetary

policy, since doing so would contravene central bank independence. However, HMT carried out a review of the ‘monetary policy framework’ in 2013, announced by the Chancellor in the Budget that year. The review was framed as a timely appraisal of 20 years of inflation targeting, policy at the zero lower bound for nominal interest rates, and unconventional monetary policy since the financial crisis.¹²⁵

The arguments made in section 4.3 imply that a repeat review of the framework would be a crucial first step to green reform. **In conjunction with BEIS, HMT should conduct a fresh review of the monetary policy framework with respect to the impact of climate change on the UK economy and consider changes to the remit for the MPC.**

Experts consulted for this paper suggested that the chance of a review of the monetary policy framework is unlikely given the short time since the 2013 version and the lack of an ‘emergency’ context to justify it. This obscures the true nature of the climate crisis, the economic gravity of which is clear even if its effects are not visible in the immediate-term.

EQUIPPING THE MPC TO BOOST SUSTAINABLE INVESTMENT

As we saw in section 2.3, there is nothing in the current remit to raise the profile of the climate crisis and its impact on monetary policy and vice versa. **The Chancellor of the Exchequer should update the remit for the MPC to require that its decisions take account of and communicate the links and potential trade-offs between climate sustainability and price stability.**

Climate sustainability could enter the remit in different ways. Here, we survey several options.

Option 1: include ‘green’ or ‘clean’ growth in the list of the government’s own objectives; the Bank would then seek to pursue price stability and, subject to that, seek to assist with clean growth where it can.

This first option would start to incorporate sustainability concerns into the MPC decision-making process. However, it fails to capture the nature of trade-offs between environmental sustainability and other macroeconomic variables, like the growth rate, and could see the MPC behave in much the same way as it has thus far. The MPC would not be required to be transparent about the environmental impact of the choices it makes. Finally, it would not alter the institutional makeup of the Bank itself, thus leaving green central bank action dependent on the present government.

Option 2: (preferably in conjunction with option 1), include a clause requiring the MPC to consider and communicate their estimates for the environmental impact of their interventions (under paragraph 6 of ‘Price Stability’, which claims that ‘the Committee should promote understanding of the trade-offs inherent in setting monetary policy’).

Arguments against green central banking sometimes cite the Tinbergen rule, which holds that an actor needs at least as many instruments as targets if it is to operate effectively. We have argued that the MPC should also receive a new monetary policy tool in the form of overt monetary finance. Nevertheless, one promising alternative to adding an objective is to focus on links and trade-offs. Monetary policy interventions have fiscal and environmental consequences. Where several options are available that guarantee a desirable path for inflation, smart policy would choose the option with the most beneficial (or least harmful) side effects. Indeed, the 2013 review recognised this, arguing that:

“ ‘the choice of which unconventional instrument to deploy reflects an assessment of the costs and benefits associated with different instruments in different circumstances.’¹²⁶

As we have seen, the fact that monetary policymakers pursue their primary objective over a much shorter time horizon than the impact of climate change does not mean that there is nothing they can do to help decarbonisation. Established procedures exist for the MPC to broadcast its thinking on environmental risks and outcomes. The Committee must publish its view of ‘the trade-offs inherent in setting monetary policy to meet a forward-looking inflation target while giving due consideration to output volatility.’

By adding ‘carbon intensity of the financial system’ (or ‘of the economy’), this clause would make the MPC a force for decarbonisation where it considers such action appropriate, while preserving its privilege to make that judgment independently. Indeed, such a process may lead the MPC to discover that promoting the low-carbon transition and pursuing price stability are far more complementary than rival objectives. This option is arguably the ideal balance between green action and institutional caution.

Option 3: promote ‘an environmentally sustainable and stable financial system’ to a second objective for the Bank of England, like the ‘maximum employment’ target of the U.S. Federal Reserve. This would require legislation to amend the Bank of England Act.

Legislation goes beyond the other recommendations made so far but is the logical consequence of many of the arguments made in this paper. As we have observed, the context for central banking has changed enormously since the 1998 Bank of England Act. The 2007-08 financial crisis saw responsibility for financial stability returned to the Bank through the legislative process. The scale of the environmental challenge that faces our economy may well require its own legislation. This is an option Parliament should consider pending a BEIS and Treasury review.

Finally, **the Bank should produce open and transparent research into how overt monetary finance might interact with the need for green and sustainable investment in the UK.** The passage from the 2013 HMT review cited above implied that monetary finance is a legal possibility. However, it also warned that ‘policy

makers need to maintain the credibility of their commitments to price stability and fiscal sustainability.¹²⁷ But it should also be technically possible to strike the right balance between preserving these commitments and responding to the severe cost of climate inaction.

The reformed Bank would be a force for decarbonisation, where consistent with its price stability objective. It would also make faster progress on tackling the financial stability risks posed by climate change. The reformed institutions within the Bank would have new responsibilities and tools, as described. Figure 5 summarises our proposals, drawing on option 2 from the foregoing discussion.

Relevant government actions.:	<p>1. BEIS* & HM Treasury to review framework</p> <p>2. HM Treasury (Chancellor) to renew remit / make climate recommendations</p>		
Institution:	<p>Bank of England</p>		
	<p>Monetary Policy Committee</p>	<p>Financial Policy Committee</p>	<p>Prudential Regulation Authority</p> <p style="border: 1px solid black; padding: 2px;">Prudential Regulation Committee</p>
Description:	<p>polymaking board</p>	<p>polymaking board</p>	<p>supervisor & regulator</p>
Mandate:	<p>maintain price stability with a view to the trade-offs with climate sustainability; subject to that, support the economic policy of HMG</p>	<p>contribute to Financial Stability Objective, and subject to that, supporting the economic policy of HMG (in particular, identifying, monitoring, and taking action to remove systemic risks, with special regard for climate-related risk)</p>	<p>promote safety and soundness and... avoid any adverse effect on the stability of the UK financial system from business or failure of PRA-authorized persons;</p>
Tools:	<p>base rate; asset purchases; overt monetary finance; forward guidance</p>	<p>direct PRA or Financial Conduct Authority on macroprudential measures, including green macroprudential</p>	<p>reporting; supervision; stress testing; climate risk assessment; penalties, censures, suspensions</p>

Figure 5: Following the reforms in our recommendations, the Bank of England’s constituent institutions would have new responsibilities and policy tools.

Proposed amendments are in bold, displayed alongside the current mandate and tools.

**Department for Business, Energy and Industrial Strategy*

Source: Positive Money

CONCLUSION

The case for greening central banks grows as we exhaust the global carbon budget and the climate crisis worsens. In many ways, the UK has been a leader in political and financial innovation to meet the environmental challenge. The 2008 Climate Change Act was a landmark piece of legislation. The UK should once again take the lead and reform monetary and financial policy to tackle climate risk and ensure decarbonisation. Both are urgent issues, and the costs of dealing with them in several years will be far greater than they are now.

A build-up of physical and transition risks will have devastating consequences as the climate worsens unless measures are put in place now to prevent it. This is well within the financial stability remit of central banks. Yet keeping the climate conversation within a financial stability framework has resulted in policy incoherence, as the Bank has taken monetary policy decisions with adverse environmental consequences. Furthermore, efforts to safeguard financial stability should consider the long-term effects of climate change on the economy. The Bank must acknowledge that it oversees the power of commercial banks to create new money when they extend loans, and the fact that currently banks favour high-carbon industries over green lending, suggesting a systemic market failure.

Reform to make climate sustainability a core purpose for the Bank would improve the institutional framework for managing the impact of climate change on the financial and economic system in its entirety. To rectify policy incoherence and open the way to greener monetary policy, the Bank should disclose the carbon risk of the assets on its own balance sheet make no further purchases of bonds issued by fossil fuel companies.

Beyond the question of climate-related risk, the UK government is legally required to meet targets for reducing carbon emissions. Its published strategy has been judged insufficient to meet the scale of decarbonisation required. Political leaders should go further and look to reform the Bank of England. Not only can the Bank help disincentivise high-carbon lending and decarbonise the UK financial system, but a more active, green monetary policy would complement action taken by the government to grow the UK market in green finance. To do so, the MPC must be equipped to take account of the climate crisis in its monetary policy decisions without relying on the FPC.

As our recommendations make clear, much can be achieved through very modest political reforms. These include:

- recommendations made as part of the remit for the FPC should refer to ‘environmental sustainability’ under the heading of ‘matters that the Financial Policy Committee should regard as relevant to the Bank’s financial stability objective’;
- the Treasury, in concert with the Department for Business, Energy and Industrial

Strategy, should conduct a fresh review of the monetary policy framework with respect to the impact of climate change on the UK economy and consider changes to the remit for the MPC;

- considering such a review, the Chancellor of the Exchequer should update the remit for the MPC to require that its decisions take account of and communicate the links and potential trade-offs between climate sustainability and price stability.

The Bank of England is uniquely placed to explain the links and trade-offs between the low-carbon transition and other economic objectives, and to promote both where possible. It can retain its operational independence over monetary and financial policy even if the goals or parameters of policy are altered. Indeed, the choice of those goals is fundamentally a political question: political reform has modified the Bank's purpose to suit historical and economic context in the past. The climate crisis presents an urgent change in context. The UK needs a central bank with a mandate which reflects that.

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