

CLIMATE FINANCIAL RISK FORUM GUIDE 2022

**Mobilising Investment into Climate Solutions –
Phase 1 Report**



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This paper represents the output of the Transition to Net Zero Working Group (TNZ WG), part of the Climate Financial Risk Forum (CFRF). It sets out recommendations for how financial institutions can mobilise investment for climate solutions and can play an important part in accelerating the transition in the real economy.

This CFRF guide has been written by industry, for industry. The recommendations in this guide do not constitute financial or other professional advice and should not be relied upon as such. The PRA and FCA have convened and facilitated CFRF discussions but do not accept liability for the views expressed in this guide which do not necessarily represent the view of the regulators and in any case do not constitute regulatory guidance.

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Overview and Acknowledgements

This paper has been written by the Transition to Net Zero Working Group of the Climate Financial Risk Forum (CFRF), which includes banks, asset managers, banks, insurers and service providers to the financial industry.

It is largely written by practitioners, for practitioners, and is intended to support financial institutions in taking practical actions to finance reduced emissions in the real economy as part of a strategic and rounded approach to achieving net zero objectives, minimizing future risks and capturing the opportunities that the transition presents.

The focus on Climate Solutions is one of several initiatives being taken forward by the CFRF TNZ Working Group.

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The content of this document does not necessarily represent the views of all members of the Transition to Net Zero Working Group.

1 Introduction and purpose

Transitioning to ‘net zero’ relies primarily on a significant reduction of greenhouse gas (GHG) emissions into the atmosphere and supporting adjustments in the economy.

What this means for financial institutions continues to evolve, with an increasing focus on reducing emissions in the real economy as part of a strategic and rounded approach to the net zero transition.

Mobilising capital investment for climate solutions can play an important part in accelerating the transition in the real economy, and, in so doing, help to reduce the future risks that financial institutions face from climate change.

The purpose of this paper is to frame the topic and provide high-level recommendations for financial institutions to consider with respect to mobilising investment into climate solutions.

These cover five broad themes, namely:

- i) considering financing across the full project lifecycle,
- ii) exploring innovative financing instruments,
- iii) engaging with recipients of finance,
- iv) leveraging expertise to influence policy, and
- v) sharing best practice.

Effective application of those themes will be largely sector-specific and depend on factors such as the level of technological maturity, the complexity of the specific infrastructure, the business risk, the income visibility and the extent to which support is required from Central or local Government.

Therefore, this paper includes three more detailed sector specific scoping notes on:

- Carbon Capture Usage and Storage (CCUS) – Annex 1
- Electric Vehicle Infrastructure – Annex 2
- Retrofitting Commercial Real Estate – Annex 3

These sector scoping notes intend to outline the scale of the opportunity, challenge and investment need at a high-level.

While the focus of this paper is on practitioner-led recommendations for financial institutions, the financing of climate solutions will require collaborative efforts across public and private sectors.

2 Framing the Investment Need

As highlighted by the CFRF Innovation working group, the ‘financing green’ approach and the upside opportunities of moving to a net zero economy tends to be underappreciated, as does the scale of the challenge and investment need.

The Energy Transitions Commission (ETC)¹ estimates that US\$4trillion of gross capital investment per year is required on average to stay on a 1.5 degree pathway and achieve net zero by 2050. This accounts for an estimated \$0.5trillion average annual reduction in investments in fossil fuel production and use over the next three decades. This equates to *net* incremental capital investments of approximately US\$3.5trillion per year on average from now until 2050. The table below (Figure 1) provides a breakdown of these estimates by industry, alongside the UK Government’s commitments and investment policies.

¹ Forthcoming Energy Transitions Commission (ETC) analysis (2022/23), *Financing the Transition*

This is comparable to recommendations by the International Energy Agency (IEA), that annual capital spending on clean energy (note ETC estimates include more than clean energy) in emerging and developing economies needs to expand to above US\$1trillion, in order to put the world on track to reach net-zero emissions by 2050 ².

Closer to home, the UK Climate Change Committee’s ‘Sixth Carbon Budget’ estimates a need for a total of £2.7trillion of investment over the years 2021 to 2035 to meet the UK’s net zero targets – amounting to a required five-fold growth in investments to c.£50billion per year in 2030 (peaking in 2035)³. Of the required £2.7trillion, the Association of British Insurers (ABI) outline that through their investment capacity, ABI members could support up to one-third of this investment (c£0.9trillion)⁴.

Figure 1: Breakdown of global investment requirements by industry, alongside the UK Government commitments⁵

Sector	UK Government ‘Build Back Better’ commitment	UK additional public and private investment committed, in line with the sixth carbon budget (2033-2037)	Global investment requirement as estimated by the Energy Transitions Commission (‘ETC’) – average per annum (2022-2050)
Power	UK will be powered entirely by clean energy by 2035	£150-270 billion	\$1750 billion to develop zero-carbon power generation capacity, \$900 billion to extend, upgrade and replace transmission and distribution networks, and \$200 billion to improve grid flexibility, including battery and seasonal storage capacity
Fuel supply and hydrogen	Deliver 5 GW of hydrogen production capacity by 2030, whilst halving emissions from oil and gas	£20-30 billion	\$40 billion to develop large scale global production of green hydrogen, to produce greenfield blue hydrogen and retrofit grey hydrogen, and \$40 billion to build refuelling stations, import, and export terminals, and storage capacities
Industry	Deliver four carbon capture usage and storage (CCUS) clusters, capturing 20-30 MtCO ₂ across the economy, including 6 MtCO ₂ of industrial emissions, per year by 2030	At least £14 billion	\$60 billion to decarbonising steel using technologies such as hydrogen-based direct reduced iron (DRI) facilities and CCS, \$10 billion to build cement plants equipped with CCS, and \$40 billion to develop and integrate CCS and pyrolysis technologies in the chemicals process
Buildings	Set a path to all new heating appliances in homes and workplaces from 2035 being low carbon	Approx. £200 billion	\$350 billion to retrofit buildings (e.g., better insulation) and install energy efficient appliances \$130 billion to install renewable heating (e.g., boilers and solar thermal water heating) \$145 billion to install heat pumps
Transport	Remove all road emissions at the tailpipe and kickstart zero emissions international travel	Approx. £220 billion	\$120 billion to develop the road charging infrastructure required to support uptake of electric vehicles, \$85 billion in sustainable aviation production plants and new aircraft (e.g. hydrogen and battery-electric), and \$35 billion to decarbonise shipping with investment in ammonia

² [Financing clean energy transitions in emerging and developing economies – Analysis - IEA](#)

³ [The-Sixth-Carbon-Budget-The-UKs-path-to-Net-Zero](#)

⁴ [ABI-climate-roadmap](#)

⁵ [HM Government Net Zero Strategy: Build Back Greener](#)

			synthesis, storage and bunkering infrastructure, and new/retrofitted ships
Removals (e.g. nature-based or engineered solutions such as Direct Air Capture ('DAC'))	An ambition to deploy at least 5 MtCO ₂ /year of engineered greenhouse gas removals by 2030	Approx. £20 billion	Estimate around \$130bn investment will be needed to make removals of carbon dioxide possible

As set out in the ABI's climate roadmap report, financial institutions face three broad categories of constraint on net zero investment: lack of supply of net zero transition opportunities to invest in, complexity of the investment process, and financial attractiveness of investing in net zero transition opportunities.

Unlocking these constraints will require actions by many different actors, including providers and seekers of financing, financial intermediaries, regulators, governments and national and international standard setting agencies. The financial services sector will need to increase the pace with which net zero plans are designed and delivered; integrate high-quality data within internal operating systems to enable the application of scientific consensus within financial decision making; and develop new financial instruments to enable investment to flow where it is needed.

Working with a wider range of stakeholders to address barriers to investment will also be key – following the model of initiatives such as the CFRF itself but also Taskforce on Climate-related Financial Disclosure, Transition Plan Taskforce and sector-focused coalitions led by institutions such as Institutional Investors Group on Climate Change, Green Finance Institute and Climate Investment Coalition. In the remaining sections of this document, examples of targeted interventions such as incentive schemes and financial instruments are used to illustrate how clear signals can be used to encourage inputs into innovative climate solutions and help early adopters de-risk investments.

3 Levers for Intermediaries and Capital Providers to Finance the Transition in the Real Economy

In Session 2 of the Climate Financial Risk Forum, the Innovation Working Group produced a range of case studies on expanding financing into the real economy, financing transition assets and improving the use of data and metrics. The group identified the following series of levers that can be used to steer the capital required:

- Policy and regulatory levers
- Making new markets (e.g., new asset classes)
- Developing/applying new financial instruments
- Building new skills and capabilities, both on the demand and supply side
- Improving and integrating new information / data to support more effective decision-making
- Enhancing citizen participation to drive financial flows
- Changing cultures, both on the demand and supply side of finance
- Giving confidence to investors that they will not be 'greenwashed'

Through a set of five recommendations, this section focuses on practical action and financial levers that financial institutions have available to them and should consider in supporting the transition to net zero by mobilising capital into climate-positive solutions, ventures, or firms. This includes some of the new financial instruments and new markets identified by the Innovation Working Group. Our recommendations consider the different

perspectives of those arranging financing ('intermediaries'), such as investment banks or consultancies, and those providing financing ('capital providers'), such as insurers, banks, and asset managers.

3.a. Financing across a project lifecycle

RECOMMENDATION 1: CONSIDER FULL LIFE-CYCLE OF FINANCING OPPORTUNITY

For intermediaries: Consider the full lifecycle of the ventures or firm under consideration when seeking or arranging financing, in order to increase the likelihood of success.

For capital providers: By understanding their role in the ventures or firm lifecycle, capital providers can identify the point at which they can offer accessible capital with the right risk/return profile.

For new and emerging climate solutions or new ventures to implement existing solutions, financing is required to support the growth and development of the firm or venture to maturity, and then maintain it on an ongoing basis. Intermediaries should plan carefully so that there's access to finance at a reasonable cost throughout the venture or the firm's growth. Different stages will likely require different types of finance. The right type of finance (in terms of both cost of capital and interest from financial institutions) will be determined by factors such as the level and nature of the risks at any given stage of the venture or firm's development, the time horizons, the level of expertise required to assess the venture and the size of investment required.

Project characteristics which influence these factors include:

- the extent to which the technology is proven;
- the extent to which the business plan is proven;
- the ability of the technology to accelerate the transition;
- the risk and speed of construction of technology;
- the cost of construction of technology/project;
- consumer perception of technology/project;
- the alignment with government policy priorities;
- the certainty and security of arising revenue streams; and
- typical market practices where precedence is set

The duration of the financing and the time horizons of relevant investors will also impact the most suitable source of funding for any given stage in the project lifecycle.

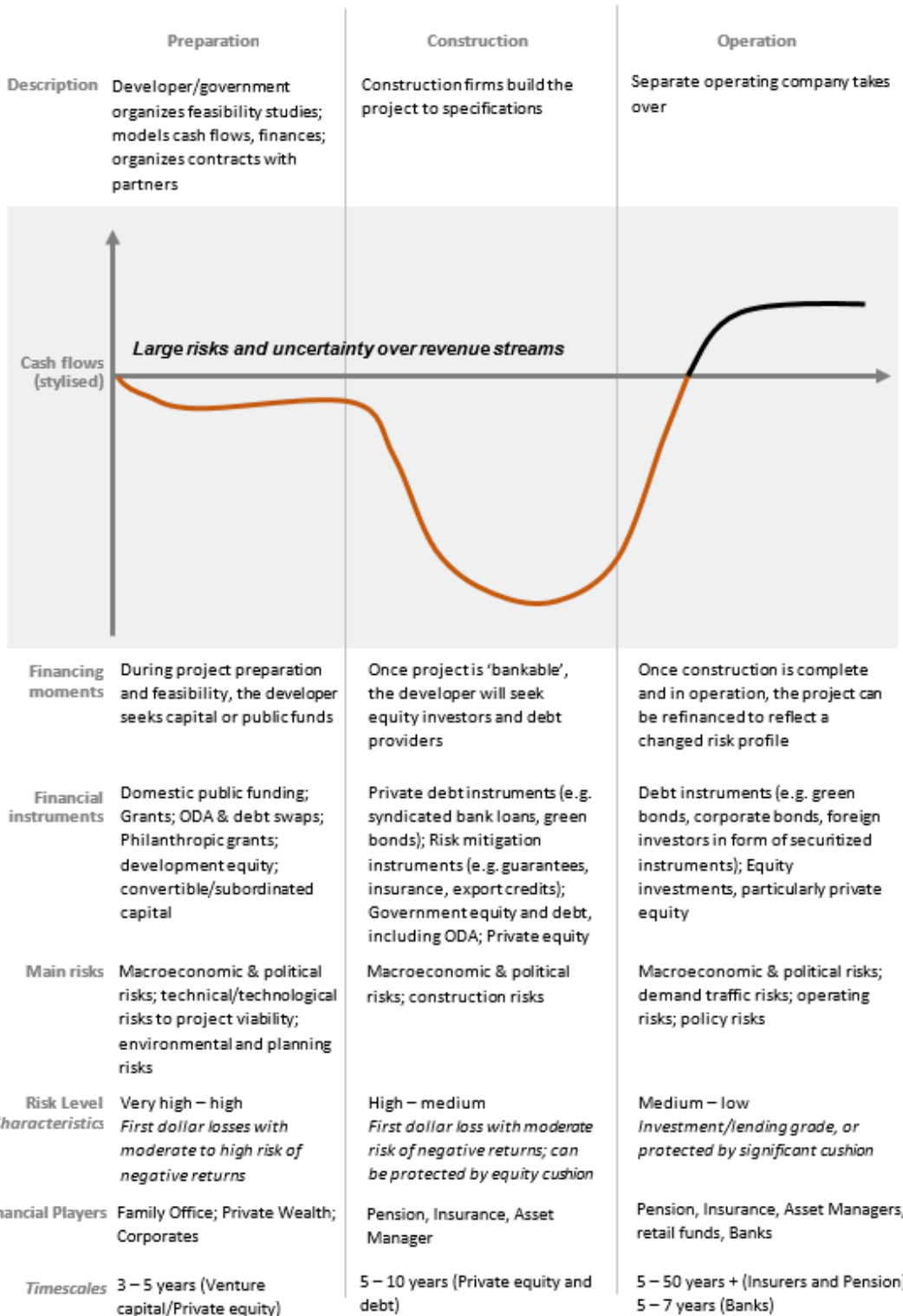
The maturity of the sector and the firm will also have a bearing on the types of financing available, and consequently on the ease with which investors can mobilise credit. Typically, less mature firms may not be sufficiently capitalised, and the credit available to them may be primarily asset-based. Whilst this form of finance continues through to the more mature stages of development, they can also be complemented with financing at the corporate level once firms are well established. The consideration for how finance is made available, and the consequences in terms of market access, is important.

Additionally, given the need for multiple actors through the project lifecycle, intermediaries should recognise that those financing a project may not have technical expertise or experience of development finance projects. Therefore, they should see that a common language is established and the relevant parties to a project are educated on the financing lifecycle.

The following diagram shows an illustrative example, which is expanded from the New Climate Economy report, of how cash flow options and risks may play out during the lifecycle of an infrastructure project. The diagram indicates the financing considerations

for an illustrative individual project in infrastructure sector, rather than specific considerations for, and characteristics of, certain climate solutions.

Figure 2. Expansion of New Climate Economy’s diagram of risk and financing considerations at different phases of the lifecycle of an illustrative infrastructure project⁶



⁶ New Climate Economy, 2016. *The Sustainable Infrastructure Imperative: A Roadmap for Financing Sustainable Infrastructure*, adapted from Bhattacharya, A., Romani, M. and Stern, N., 2012. *Infrastructure for Development: Meeting the Challenge*. Centre for Climate Change Economics and Policy Grantham Research Institute on Climate Change and the Environment.

At development stage:

- Development capital (primarily in the form of equity) is often funded by strategic players given risk appetite and ability to absorb development risks. Financial investors have gradually become more comfortable with development risks, especially in mature technologies. The types of capital provided primarily ranges from straight and preferential equity to convertible equity; debt is rarely provided. Some banks have started providing guarantees for performance bonds when development is well advanced.

At Final Investment Decision ('FID'):

- Equity: Cheaper sources of equity (financial investors) become available.
- Debt: At FID when the project is de-risked project financing becomes available.

At or after Commercial Operation Date ('COD'):

- Equity: Projects benefit from further de-risking attracting equity from investors with the lowest cost of capital.
- Debt: Project Financing is often refinanced at tighter terms and additional potential for subordinated financing is often tested.

Case study: Banking sector (Barclays were 1 of 12 banks in the funding club)

Below illustrates how different types of financing are deployed at each stage of the financing project, with an example of sources of funding for an offshore wind project in Scotland, Seagreen Offshore Windfarm. Note that duration of the various stages is specific for Seagreen and will vary depending on jurisdiction, type of technology, etc.

Stage	Timescales	Financial instruments and players
Preparation	5-6 years: Planning consents were initially awarded in 2014, various amendments were made to the consent over the following years. Seagreen was awarded a CfD in the Round £ allocations in September 2019. Financial Close (commitment of project and equity financing for construction) occurred in June 2020	Development was originally funded by the strategic player SSE Renewables & Fluor. In 2018 SSE purchased Fluor's stake.
Construction	2-3 years: Construction started in Q2 2020 and the wind farm is expected to be commissioned Q2 2023. First power was achieved August 2022	Equity: Equity capital provided by strategic sponsors: Total, agreed to acquire a 51% stake and enter the project at Financial Close and start of construction in June 2020). Shareholder structure following the transaction: SSE 49% & Total 51%. Debt: Project financing provided by financial institutions/banks: At the time a consortium of 12 banks & 2 Export Credit Agencies provided c. £1.4bn of senior debt (and interest rate & FX derivative instruments) to fund £3 bn of construction and related costs. There was also a mezzanine tranche
Operation	25 years +	Equity: Following commissioning of the project, strategic equity providers tend to further divest their stakes to financial / yield investors. Some of the financial investors, depending on their cost of capital, tend to also sell their stakes to lower cost of capital players. Debt: Following commissioning of projects it is common for the Borrowers to refinance the Project financing to benefit from the removal of construction risk, this can often result in tighter pricing and or increased leverage. .

3.b. Financial instruments, products and services

RECOMMENDATION 2 – EXPLORE INNOVATIVE FINANCIAL INSTRUMENTS

Identify, invest in and design financial instruments, products and services which support the financing of the real economy transition, by attracting funding to ventures or firms that are linked to the climate transition, lowering the cost of capital and/or increasing access to liquidity and capital providers.

For intermediaries, there are financial instruments linked to sustainability which can give access to a wider pool of funding and lower cost of capital. These can be used to fund particular ventures, or for more general financing of a firm.

The benefits for capital providers of such instruments include more easily identifiable opportunities to support the transition or invest in instruments with potentially lower sustainability risks, and to demonstrate additionality, intentionality and measurability of investment more easily in climate solutions and transition activities.

The table below lays out a non-exhaustive list of some examples of financial instruments, products and services that can support the real economy transition.

Financial instruments, products and services	Description	Additional resources or case study references
Green bonds	As defined by ICMA, green bonds are any type of bond instrument where the proceeds or an equivalent amount will be exclusively applied to finance or re-finance, in part or in full, new and/or existing eligible Green Projects and which are aligned with the four core components of the Green Bond Principles (GBP).	<p>ICMA Green Bond Principles</p> <p>CFRF Innovation Working Group Building the green / climate bond market case study</p> <p>GAM Investments example GAM Climate Bond Impact Report</p> <p>See case studies below table</p>
Green loans	As defined by the Green Loan Principles, green loans are any type of loan instrument made available exclusively to finance or re-finance, in whole or in part, new and/or existing eligible Green Projects.	<p>LSTA Green Loan Principles</p> <p>HSBC example Green SME Fund HSBC UK</p>
Sustainability-linked bonds (SLBs)	As defined by ICMA, Sustainability-Linked Bonds (“SLBs”) are any type of bond instrument for which the financial and/or structural characteristics can vary depending on whether the issuer achieves predefined Sustainability/ ESG objectives.	<p>ICMA Sustainability-Linked Bond Principles</p>
Sustainability-linked loans	As defined by the Sustainability-Linked Loan Principles, sustainability-linked loans are any types of loan instruments and/or contingent facilities (such as bonding lines, guarantee lines or letters of credit) which incentivise the borrower’s achievement of ambitious, predetermined sustainability performance objectives.	<p>LSTA Sustainability-Linked Loan Principles</p>
Local Climate Bonds (or Community Municipal Investments)	Local Climate Bonds (LCBs) are debt instruments issued by a Local Authority to raise funds directly from the public via a crowdfunding platform. The proceeds are used to deliver Net Zero projects such as energy efficiency, clean energy generation and natural capital. Possibility to establish framework that complies with the Green Loan Principles.	<p>Green Finance Institute Financing energy efficient buildings: the path to retrofit at scale</p>

Green mortgages	<p>As defined by the World Green Building Council, under a green mortgage a bank or mortgage lender offers a house buyer preferential terms if they can demonstrate that the property for which they are borrowing meets certain environmental standards. If the running cost of a new property can be reduced for the homeowner through the use of renewable energy (e.g., solar), the homeowner's resulting higher disposable income would offer the lender greater security, so the risk premium and therefore mortgage interest could decline. Together with the Loan Market Association, the Green Finance Institute developed a framework of voluntary guidelines (the Green Home Finance Principles) to provide financial institutions with a consistent and transparent methodology for the allocation of finance towards retrofitting works.</p>	<p>Green Finance Institute The way ahead for the UK's green mortgage market Green Mortgage hub</p> <p>CFRF Innovation Working Group Enabling structural change in building retrofit to meet national ambitions case study</p> <p>HSBC example Green mortgage</p> <p>Bank of England research Research found that mortgages against energy-efficient properties are less frequently in payment arrears than mortgages against energy-inefficient properties</p> <p>Rightmove research Research found the premium paid for high EPC-rated properties may also improve credit risk. (Note research does not control for refurbishment and so the correlation cannot be confirmed.)</p>
Green deposit accounts	<p>Could attract a lower tax on interest earned as bank can only use these funds for sustainable investments</p>	<p>Citi Group example Green Deposits</p>
<p>Public-private partnerships</p> <p>Blended finance</p>	<p>E.g., shared ownership of large infrastructure investments or shared financing of large retrofitting projects</p> <p>Combining public or philanthropic capital and private capital, usually through a common investment structure</p> <p>For asset managers and asset owners, public-private partnerships and blended finance offer a means of accessing investment opportunities that might otherwise be unsuitable. The use of public/philanthropic concessional capital can 'crowd in' private investment by essentially altering the risk-return profiles of investments, such as through first loss tranche or guarantees. This can attract investors who might otherwise be limited by fiduciary duty and risk-bearing capacities, particularly for early-stage technologies or in emerging markets where investments are typically perceived as higher risk. Public/philanthropic capital acts as a catalyst and thus magnifies its impact by crowding-in additional private funding.</p>	<p>The UN-convened Net-Zero Asset Owner Alliance Discussion Paper identifies a number of potential solutions to help scale blended finance, including greater theme-, sector- and country- agnostic public and philanthropic funding (so that it can be matched with an appropriately diversified investment product) and increased clarity from regulators to build investor confidence in these structures.</p> <p>CFRF Innovation Working Group Leveraging private capital with public funds into levelling up case study</p>
Products and services targeted at financing climate solutions or transition activities*	<p>Asset managers can create such products with a mandate to invest in climate solutions or transition activities.</p> <p>Asset owners can work with their asset managers to develop products or invest in existing products.</p> <p>Private equity funds can acquire stakes in firms that are currently not aligned with the Paris Agreement trajectory to use their influence to drive improvements</p> <p>Venture capital funds – given their typical risk-return preferences – may be able to invest in early-stage technologies, to finance them until they have proven technology and business model.</p>	<p>CFRF Innovation Working Group Long Term Asset Funds case study</p> <p>CFRF Innovation Working Group Investing funds into venture capital assets and climate solutions</p> <p>CFRF Innovation Working Group Investing capital into climate solutions</p>

	<p>Banks can also support early-stage disrupters through accelerator programmes and principal investments.</p> <p>Investment institutions should use multiple data providers to enhance their product offering and provide the climate data that asset owners need for portfolio management and risk assessment.</p>	<p>CFRF Innovation Working Group Enabling structural change in industry sectors case studies</p> <p>HSBC example Supply chain finance - HSBC and Walmart partner to drive sustainability of businesses</p>
<p>Pricing/underwriting approaches and technologies</p>	<p>The insurance market provides a range of solutions designed to 'de-risk' innovative technologies, such as renewable energy generation. These include:</p> <p>Cover for technology performance – this cover ensures operating and fixed costs, and in some cases, investor returns, can be met in the event of lower yields, unusual weather patterns or underperformance. This can also allow for upgrade or maintenance where design issues are identified.</p> <p>Equity contribution guarantee – this allows developers to defer project finance payments while still injecting additional equity as projects scale up.</p> <p>Cover for users of 'microgeneration' technologies – where businesses (or households) invest in microgeneration, such as solar panels or heat pumps, which require upgrade and maintenance insurance can protect them against the original manufacturer ceasing operations or becoming insolvent</p> <p>Tax credit insurance – where tax incentives are used to incentivise development, insurance cover can help developers access investment from tax equity investors</p> <p>Parametric insurance – these forms of insurance are increasingly being offered to help a range of businesses, especially in the developing world, manage risks associated with wider volatility linked to climate risk, with cover being triggered whenever an event occurs, rather than in relation to a specific 'loss', incentivising investment by providing broader protection against uncertainty. This form of cover is expected to expand considerably in the future.</p> <p>In addition to these specialised products aimed at new technology, 'traditional' insurance services also play a key role in incentivising transition technologies – including climate risk management services and structured incentives within environmental liability policies.</p>	<p>Sustainable Markets Initiative Insurance Task Force Products and Services Showcase, August 2022</p>

* We note the importance of firms developing or using innovative methodologies/analytcs/tools to price climate risk effectively, which is critical in informing the appropriate allocation of capital to support the economy-wide transition. This includes the need to use forward-looking scenarios and financial metrics to assess climate risks, given the challenges with using carbon metrics only: beyond the systematic gaps and biases inherent within nature of carbon reporting, they can tell a company or investors little about the financial impact of the transition on a business or financial impact of physical risks. As discussed in the CFRF's 2021 Data and Metrics report⁷, the financial risks and opportunities from a 'well below 2C' scenario are not necessarily correlated with carbon intensity, or other carbon related non-financial metrics. As highlighted by Sarah Breeden's speech⁸, focusing only on carbon metrics could lead investors down route of divestment and paper decarbonisation, which can have unintended consequences.

⁷ [CFRF 2021 Data and Metrics report](#)

⁸ ['Balancing on the net-zero tightrope'](#) – Sarah Breeden's speech

*** We also note that index providers⁹ and data providers¹⁰ also have a significant role to play in providing benchmarks, data and analytical solutions to identify investments that support investor climate goals, managing climate risks and increasing exposure to climate opportunities.*

Case study: Just Group

Just Group plc, a specialist UK financial services group focussing on the retirement sector, has twice raised capital totalling £575m by issuing bonds with associated commitments to invest in new or existing projects with positive environmental or social impacts. Examples of the types of projects that fulfil positive environmental impacts include renewable energy, energy efficiency, clean transportation, green buildings, waste or water management and climate change adaption.

Just Group recognised that conforming with a recognised standard for sustainable finance, in this case the Sustainability Bond Guidelines of the International Capital Management Association, would give investors comfort that the commitments contained in the bond would be monitored and would help to counter potential concerns of “greenwashing”.

Just Group benefited from increased demand for its bonds compared to regular financing as well as the associated recognition of its commitments to sustainability generally and to climate adaptation in particular.

Amongst Just Group’s investments that meet the climate commitments is a North Sea windfarm, a green-certified building in the UK and a number of solar farms in Spain.

Case study: PIMCO

Supporting climate solutions is one of the four pillars of PIMCO’s Net Zero Framework ([link](#)) as PIMCO believes the bond market plays an important role in supporting the global transition to a net zero carbon economy, thanks to its size, the repetitive nature of bond issuance, and the presence of a large and growing market of bonds financing the pathway to a low carbon world. This involves labelled green bonds, as well as unlabeled bonds of issuers that are materially exposed to climate solutions, such as solar energy or electrified passenger rail transport.

Beyond asset class-specific ESG scoring frameworks, PIMCO also engages with issuers on best practices for ESG-labelled bonds (as noted in PIMCO’s Best Practice Guidance for Corporate Sustainable Bond Issuance ([link](#))) and evaluates specifically these instruments, mapping them across a spectrum based on strategic fit, potential impact, and red flags and reporting, resulting in PIMCO’s proprietary impact score for green, social or sustainability bonds. For example, it assesses the alignment of the issuers’ decarbonisation and net zero strategies with the bond’s objectives and use of proceeds as well as the evidence of significant positive outcomes compared to “business as usual”, including emissions reductions in the real-economy.

As well as designated products (i.e., the examples of direct and intentional financing levers laid out in the table above), the influence of the financial sector can filter through a wider range of decision making across all financial products and services. For example, a key creditor sitting out a primary issuance could drive cost of capital up and limit access to liquidity. This could be on a case-by-case basis or through restrictions on investment or lending. For secondary markets, this approach can be less impactful

⁹ FTSE Russell, 2022. [Green equity exposure in a 1.5°C Scenario: Applying climate investment trajectories with green revenues.](#)

¹⁰ FTSE Russell, 2022. [Investing in the Green Economy 2022: Tracking Growth and Performance in Green Equities.](#)

unless the financial institution represents a significant stake, although there is some evidence liquidity in secondary markets does impact primary issuance.¹¹

The Government can also incentivise investment in climate solutions through, for example, tax incentives for green research and development. This is explored in the following section and will be developed further in the next phase of TNZ work, with a focus on levers that policy makers could consider to further enable financial institutions to mobilise investment into specific climate solutions / sectors.

3.c. Influencing corporate actions and policy

Capital providers can use their rights and influence to directly (for example through shareholder resolutions or proxy voting in listed equity) or indirectly (for example through advocacy to influence the regulatory environment) influence corporate behaviour. This is an important influencing mechanism for listed equity in particular, where it is more difficult to influence cost of capital or access to liquidity.

RECOMMENDATION 3 – ENGAGE WITH RECIPIENTS OF FINANCE

Capital providers: identify and deploy methods of engagement with recipients of finance to influence their behaviour, including using escalation strategies if required.

The nature of engagement will vary depending on the type of financial institution and the asset class; the table below lays out some considerations for engagement by sub-sector.

Sub-sector	Engagement method	Existing resources to support FIs with their engagement strategies
Asset managers	Engaging with investees is a significant way to drive change and support the real economy transition. Active ownership by investors will be crucial to meeting climate goals, and as relevant to all asset classes (as demonstrated by the UK Stewardship Code’s 2020 requirement that asset managers engage across all asset classes). Priority topics of engagement may include target setting and alignment with the Paris Agreement/a 1.5°C pathway, including assessing the reliability of the assumptions used in this assessment, and development of a credible strategy to achieve these targets supported by effective disclosure. Investor engagement, either individually or collaboratively, to promote higher rates of disclosure is critical for information flow in markets. Research from FTSE Russell reveals low disclosure rates for sustainability metrics, such as green revenues, where corporate disclosure rates currently sit at below 30% ¹² , and carbon emissions, where disclosure rates are slightly better but still 42% of firms do not disclose both Scope 1 and 2 emissions. ¹³	<p>The work of initiatives such as Climate Action 100+ (CA 100+) - a collaborative investor-led engagement initiative to ensure the world’s largest corporate greenhouse gas emitters take the necessary action on climate change – demonstrates the impact of engagement and collective action. 111 of CA 100+ focus companies have set net zero targets for 2050 or before, compared to just five in 2018 after the initiative’s launch.</p> <p>UK Stewardship Code 2020</p> <p>The Institutional Investors Group on Climate Change (IIGCC) Net Zero Investment Framework</p> <p>The Principles of Responsible Investment (PRI) guidance, including asset-class specific guidance</p> <p>Glasgow Financial Alliance for Net Zero (GFANZ) provides guidance across several topics for financial institutions, such as</p>

¹¹ B. Caldecott et al., 2022. *How Sustainable Finance Creates Impact: Transmission Mechanisms to the Real Economy*. Oxford Sustainable Finance Group, Smith School of Enterprise and the Environment, University of Oxford p16

¹² See P30-31 FTSE Russell, 2022. *Investing in the Green Economy 2022: Tracking Growth and Performance in Green Equities*.

¹³ Based on the FTSE All-World, which includes large- and mid-cap firms; See P4 FTSE Russell, 2022. *Mind the Gaps: Clarifying Corporate Carbon*.

	Engagement can be individual or collaborative with other investors.	measuring portfolio alignment and forming transition plans.
Asset owners	<p>Asset owners may be able to influence in the same way as asset managers above.</p> <p>Unlike asset managers, asset owners have direct control over the assets that they may choose to invest in. Asset owners can set investment criteria that supports direct allocation of capital to transition objectives.</p>	<p>Net zero Asset Owners Alliance (NZAOA)</p> <p>PRI</p>
Banks	<p>Banks are increasingly setting emissions intensity reduction targets for high emitting sectors and restrictive lending policies for sectors such as coal.</p> <p>Greenhouse gas emission estimations in their portfolio that can help borrowers measure their own footprint</p> <p>Managing their risks (e.g., banks may reduce risk appetite by better taking into account climate risk) or implementing scenario analyses and stress testing practices.</p> <p>Ceasing financing to companies that fail to meet policies in relation to thermal coal and oil sands is a lever to influence behaviour.</p> <p>Corporate client engagement</p> <p>Retail bank consumer education</p>	<p>Net-Zero Banking Alliance (NZBA)</p> <p>The industry-led, UN-convened Net-Zero Banking Alliance brings together a global group of banks, currently representing about 40% of global banking assets, which are committed to aligning their lending and investment portfolios with net-zero emissions by 2050. Combining near-term action with accountability, this ambitious commitment sees signatory banks setting intermediate targets for 2030 or sooner using robust, science-based guidelines</p> <p>JPMorgan uses its Carbon CompassSM Methodology to engage clients on climate issues.</p>
Insurers	<p>In their role as asset owners, insurers can exercise 'stewardship' techniques to influence behaviour. In some cases, especially where they are direct investors, this can take the same form as the asset manager examples used above. In addition, asset owners can use their mandates to influence the way that asset managers apply stewardship.</p> <p>In their role as underwriters of risk, insurers have a range of tools to influence behaviour of clients – in particular where insurers can oblige clients to act to reduce potential exposures as a condition of providing cover.</p> <p>Internal GHG reduction targets for 'insurance-associated emissions' could encourage insurers to prioritise providing affordable cover for real-economy transition projects.</p> <p>In some cases, insurers can withdraw from providing cover to certain product lines, where these do not align with the need to transition to Net Zero (though such decisions will need to ensure that people living and working near infrastructure are not disadvantaged by a lack of access to compensation).</p>	<p>Net Zero Insurance Alliance</p> <p>www.unfriendcoal.com</p>

RECOMMENDATION 4 – LEVERAGE EXPERTISE TO INFLUENCE POLICY

Intermediaries and capital providers should use their expertise to identify specific changes to policy, regulation and international agreements that would enable or accelerate investments and should use their influence to advocate for them

Financial institutions can make significant contributions to advancing climate solutions and financing the transition - in particular, their understanding of the investment landscape allows them to identify specific barriers and potential solutions to scaling up investment across sectors

and geographies.

Achieving net zero-aligned investment at scale ultimately requires deploying new technologies and new business models to deliver new market opportunities. The policy environment will be a critical enabler of success – given existing policy and regulation in the real economy were created under a different set of operating and market conditions. It is critically important therefore that the right incentives and regulatory frameworks are created that enable the capacity for the market to deliver the investment needed.

We recommend that the financial sector establishes dialogues with policymakers on the detail of policy aimed at attracting private capital. In particular, they should articulate how regulation, policy incentives and targeted public finance could be used to create an investment environment that can crowd private capital in to support the delivery of a net zero and resilient economy. This can be done individually and collectively via multisectoral groups. Examples of multisectoral groups include the work of the Green Finance Institute (GFI), Institutional Investors Group on Climate Change (IIGCC) and Glasgow Financial Alliance for Net Zero (GFANZ), mentioned earlier. Specific initiatives in the insurance and banking sectors are also convening financial institutions to address financing challenges. For example, the Insurance Taskforce of the Sustainable Markets Initiative¹⁴.

The case for seeking and providing transitional financing is clearer when it is being sought to meet future anticipated regulatory expectations. A predictable policy environment is required to encourage private investment in climate solutions and transition activities. Clear policy signals can help early adopters de-risk investments.

In line with actions being called for by other financial sector industry initiatives (such as those listed above), financial institutions are advocating for policymakers to take action, including the steps outlined below:

- 1 Declare net zero targets, in line with limiting global temperature rise to 1.5 °C, for 2050 at the latest.
- 2 Set corresponding 2025 and/or 2030 interim targets in order to support financial institutions' engagement with corporates on the transition;
- 3 Develop and publish credible sectoral roadmaps which will collectively deliver net zero/interim targets, backed up by a blend of cross-sectoral and sector-specific policies to attract and de-risk private investment. In addition, this may be supported through targeted interventions to encourage early adopter investments.
- 4 Use public funds to crowd in private investment through the use of blended finance, and scaling finance for mitigation, adaptation and resilience.
- 5 Strengthen mandatory climate disclosures across the financial system aligned with the recommendations of the Taskforce on Climate-related Financial Disclosures and the forthcoming standards of the International Sustainability Standards Board. For example, the UK has established the Transition Plan Taskforce¹⁵ to advance disclosure around transition plans in the UK.

As a contribution to this process, CFRF has developed sector-specific scoping notes on CCUS, EV infrastructure and retrofitting commercial real estate, as annexes to this report. More granular work into these specific sectors will take place in Q4 2022 and Q1 2023, including recommendations for the financial sector and policymakers to work together to mobilising investments into these areas.

RECOMMENDATION 5 – SHARE BEST PRACTICE

Intermediaries and capital providers should share best practice to encourage others to follow models that support the transition of the real economy

¹⁴ <https://www.sustainable-markets.org/taskforces/insurance-taskforce/>

¹⁵ <https://transitiontaskforce.net/>

By sharing best practice examples and information on overcoming challenges, intermediaries and capital providers can help to advance the economy-wide transition. This can be done through their own reporting mechanisms, or through membership of groups such as the CFRF and the Banking Environment Initiative (BEI)¹⁶.

Note to Editors

This document is aimed at financial institutions to assist them in their efforts to support the transition to Net Zero. In reality, these financial institutions are one part of a complex and interrelated system with multiple interdependent parties. The actions and interactions between these parties will dictate the success of the transition or otherwise. The following notes attempt to explain at a high level the interaction of each party in the system in order to help editors contextualise the efforts of the CFRF.

- a. When constructing financing solutions for the real-economy transition, intermediaries and financial institutions have to consider the respective interest of key stakeholder groups outside the financing project and how their interests interact with the proposed financing. This includes whether those respective interests can be leveraged to support the financing of new ventures/technologies.
- b. Customers provide the funds (in the form of deposits, investments or pension savings) to capital providers that are ultimately invested in sustainable initiatives on their behalf. They have a primary interest in the return on their investment with varying degrees of certainty according to the nature of their contracts and the risk profile of the investment. They expect Governments to establish and uphold legal frameworks that protect their investments. They increasingly have a secondary interest in the way that the money that represents their funds is invested and may become more engaged in Sustainable Finance as it becomes more established and discussed.
- c. Capital Providers accept varying degrees of risk according to their appetite for reward

¹⁶ <https://www.cisl.cam.ac.uk/business-action/sustainable-finance/banking-environment-initiative>

and loss. Generally, capital providers are incorporated as companies, either publicly or privately, however they can also take the form of pension funds where the sponsor is the capital provider or as other forms of trusts or investment vehicles. Generally, the interests of the body corporate are represented by a board of trustees who set the risk appetite of the body on behalf of the capital providers. The capital providers expect government to ensure stability in law and regulation so that their expected return can be assessed based on the merits of the investments and without external political or regulatory disruption.

- d. Government set the policies and law that establish the equilibrium between customers and capital providers in a way that fulfils the government’s policy aims. It should also have a deliberate risk appetite that establishes the circumstances in which they will take over a capital provider that becomes insolvent and therefore instils confidence in customers that their contracts will be fulfilled. They may delegate the duty of rulemaking and supervision of practitioner companies to regulators.
- e. Regulators should act on behalf of government to maintain the desired balance of interests between customers and investors to ensure that government policies are achieved within the government’s risk appetite as economic conditions change.

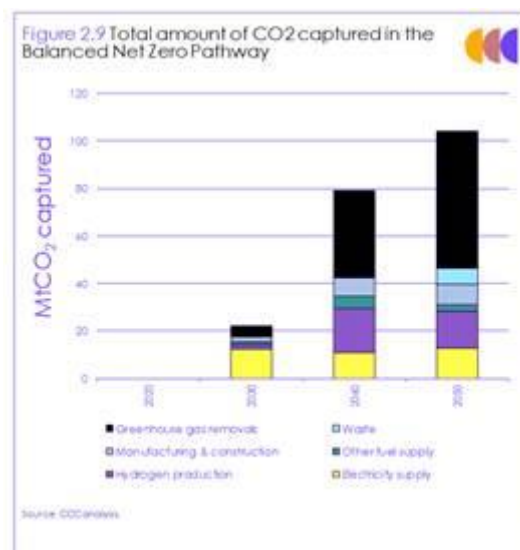
ANNEX 1: Carbon Capture, Utilisation and Storage (‘CCUS’) - scoping note

The scale of the opportunity, challenge & investment need

Most cross-economy pathways for delivering net zero in the UK include a large component of Carbon Capture, Utilisation and Storage (CCUS). This is because in a number of sectors, the challenge of delivering alternative methods for decarbonising at lower/equivalent cost are likely to be limited. CCUS therefore forms a key part of cost-effective pathways.

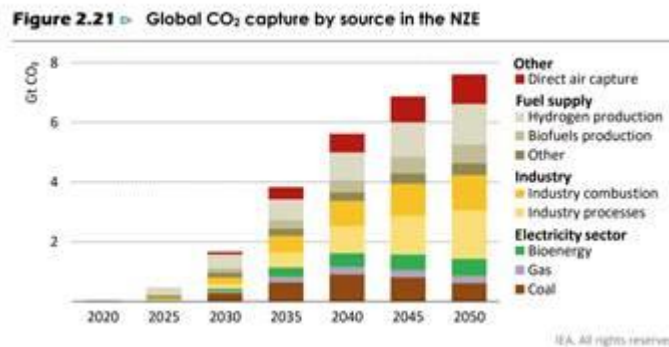
The Climate Change Committee’s central 2050 scenario foresees a requirement of over 20 megatonnes (Mt) of CO₂ captured and stored per year by 2030; 80Mt by 2040; and over 100Mt by 2050.

Government forecasts are similar, with an aim of 20-30Mt of CO₂ captured and stored by 2030.



Source: CCC 6th carbon budget advice

CCUS is also seen as a crucial technology for global decarbonisation. The International Energy Agency’s net zero pathway estimates a requirement of 7.6 gigatonnes in 2050 – equivalent to around 20% of total global emissions in 2020.



Source: International Energy Agency

While the costs of CCUS are uncertain, all elements of the technology have been tested (for example through use in enhanced oil recovery) and deployment is the key next stage for reducing costs.

What is CCUS?

Carbon Capture, Utilisation and Storage (CCUS) is a process by which CO₂ emissions, principally from the combustion of fossil fuels, are captured and stored.

It can make a contribution to decarbonisation in three main areas:

- Power generation: capture of emissions produced by power generation from waste, gas, coal or bioenergy.
- Industrial production: capture of emissions produced by combustion of fossil fuels or bioenergy in industrial production processes.
- Hydrogen production: hydrogen produced by steam methane reformation uses gas an input fuel; the resulting emissions are captured and stored.

The infrastructure associated with CCUS can also be used to support greenhouse gas removals (i.e. the direct removal of CO₂ from the atmosphere).

CCUS requires significant infrastructure investment across the value chain – in particular:

- The installation of capture technology at point sources, such as power stations or industrial installations;
- The development of transport and storage (T&S) infrastructure, to move captured CO₂ from point sources to storage sites.

Total investment requirement is likely to run into the tens of billions; the UK Government has estimated an investment requirement for T&S alone of £15bn by 2035.

The UK has the potential to be leading global player in CCUS deployment. It is

in the top 5 countries globally for CCUS readiness¹⁷, and has one of the largest potential CO₂ storage capacities in Europe. There is significant potential to transfer existing capabilities and skills into CCUS given UK expertise in offshore infrastructure projects. The government has estimated that CCUS-enabled clusters could support 50,000 jobs in the UK by 2030; and there is a significant export potential given the potential for engineering, procurement and construction management services.

Potential challenges & barriers to investment

Designing markets and investment models which will attract large-scale investment in CCUS is challenging, for four principal reasons:

- Unlike some other low carbon investments, CCUS will increase costs in comparison to unabated fossil fuel alternatives (i.e. it is cheaper to burn fossil fuels and release CO₂ into the atmosphere than it is to burn fossil fuels, capture and store the CO₂) unless a value is placed on the CO₂ captured.
- CCUS is a novel infrastructure investment – while all the component elements of the technology have been demonstrated, it has not been delivered at scale in the UK or elsewhere.
- There is a significant coordination requirement to ensure CCUS infrastructure can efficiently serve a range of point sources – for example by focusing CCUS infrastructure around “clusters” of emitters to enable scale efficiencies to be delivered. This challenge is exacerbated by the complex supply chain involved in delivering the various elements of CCUS.
- Providing a sustainable funding model for shared infrastructure for transport and storage requires specific funding arrangements to be in place.
- There are a range of long-term risks to be managed, for example liabilities for future leakage from CO₂ stores.

Lessons learned from existing infrastructure investment

While CCUS has a unique set of challenges to deliver investment, there are lessons to be learned from other sectors. The success of UK deployment of offshore wind shows how complex technology involving deployment of infrastructure at scale, connectivity to energy networks, national policy structures and local/regional decision making can develop into an attractive asset class, thanks notably to the Contract for Difference regime. A recent report from the [Institute for Global Change](#) captures some of the key lessons which could be built upon.

Enablers of CCUS

¹⁷ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1068444/ccus-roadmap.pdf

A significant amount of work has already been done to develop investable models for CCUS in the UK.

The UK government is focusing on developing CCUS around key industrial clusters – helping to deliver economies of scale and provide a net zero-aligned future for industrial areas. Key components of its approach are: launching a range of funding schemes to support CCUS deployment, with the aim of establishing four operational industrial clusters by 2030; investing to build T&S infrastructure to enable delivery of the 2030 target to capture 20-30Mt CO₂/year; and taking steps to build a stable long-term market to drive investment.

These are not yet final and have focused principally on deployment of “first of a kind” projects. Given the scale of the deployment challenge, there is a need to move to business models which can enable investment for “nth of a kind” projects to flow at scale.

The key objective should therefore be to ensure we have stable investment regimes in place, which enable capital to flow at scale from a range of providers, including those such as pensions investors with significant scale but relatively low risk appetite.

There is much that financial institutions can do to rapidly scale the investment required and navigate the challenges specific to CCUS infrastructure. Specific considerations for the next phase include:

- **Working with policymakers to determine and put in place the appropriate, stable investment regimes** for both deployment of CCUS capture technology at point sources, and for T&S infrastructure. This may include:
 - Advocating for legislation that will enable the rapid design and implementation of business models for CCUS deployment, such as the Energy Bill that is proposed currently. The recent publication of a [draft Dispatchable Power Agreement](#) is a welcome example of progress.
 - Clarifying how risk should be allocated between different actors in the value chain to enable risks to be priced and reflected in the cost of capital.
 - Articulating the needs for each element of the CCUS value chain, adapted to the different activities for which it will be used. This could include, for example, instruments in the power sector which provide appropriate levels of de-risking for investors; clarity on how risk and return regimes drive investment in T&S infrastructure; and work to develop the business case for investment in hydrogen production, including reliable demand for hydrogen produced.
 - Anticipating issues, such as the emergence of potential obstacles with the planning regime
- **Understanding of funding regimes.**
 - There are a number of funding commitments for CCUS in place, and investors need to better understand how to navigate them. Seeking clarity on the interaction between different funding pots, and how they will evolve over time will be important.
 - Investors have an opportunity to engage with the UK Infrastructure Bank (and other government mechanisms for de-risking investment and crowding in private capital).

- **Coordination with other actors.** A key challenge for CCUS is the requirement to coordinate a wide range of actors – for example, the various CO₂ producers (heavy industry, power generation) in clusters; local and regional government and other bodies; central government; and investors / capital providers. Coordinating with these actors will be essential to enable the packaging of investable propositions.
- **Direct engagement across the full range of potential capital providers.** There is an opportunity to build on the recent CCUS Investor Roadmap by engaging directly with the full range of potential capital providers for CCUS deployment. A structured engagement programme would enable issues with investment models to be identified and addressed, and help build investor confidence to enable a broad pool of capital availability and reduced cost of financing.

ANNEX 2: Electric Vehicle (‘EV’) Infrastructure - scoping note

The scale of the opportunity, challenge & investment need

The decarbonisation of road transport, via drivers switching to electric vehicles (EVs), forms a key part of the UK Government’s Net Zero Strategy. The switch to EVs also has other societal benefits, especially the impact on air quality.

- The biggest share of GHG abatement for the surface transport sector will come from the switch to EVs – making this a critical part of the overall UK Net Zero strategy.
- The UK Government has set a clear target (to end the sale of all petrol and diesel vehicles by 2030) and this has been met by a change in consumer behaviour (in 2021, one in every eight car sales was an EV – more than the total number for the previous five years combined).
- To meet this ambition, there needs to be a rapid increase in the installation of public chargepoints and more clarity over how many of these need to be rapid or super rapid. Although the primary chargepoint for many EV drivers will be their homes, 90% of current EV drivers use public chargepoints for at least some of their journeys.
- Availability of chargepoint infrastructure and ‘range anxiety’ is one of the two key barriers drivers that would potentially dissuade them from switching to an EV – so the wider objective of phasing out the sale of petrol/diesel vehicles will not be met without this infrastructure.

- To meet an objective of at least 300,000 public chargepoints¹⁸, the UK will need to install c30,000 new chargepoints each year up to 2030. There are currently just under 34,000 chargepoints in the UK, of which 6,236 are either ‘rapid’ or ‘super rapid’ chargepoints¹⁹, capable of charging a vehicle within 30 minutes.
- Good progress has already been made –the Government has a clear target for both vehicles and the charging infrastructure, it has published a detailed strategy for charging infrastructure and announced a pipeline of public funding.
- The financial services sector has already shown a significant willingness to invest in this infrastructure²⁰. However, as the Government’s own strategy acknowledges, progress in rolling out chargepoint infrastructure is currently too slow, the planning system is too complex and there is too much regional variation amongst local authorities in their approach.

Potential challenges & barriers to investment

The Government’s EV charging infrastructure strategy sets out a strategy for how local authorities and businesses will roll out public charging infrastructure. There are a wide range of challenges that will need to be overcome:

- Even with the policy signals the Government has provided, early investment in EV charging infrastructure is not low risk. Charging infrastructure needs to be delivered ahead of need, to ensure drivers are confident enough to switch to an EV. This means there will be a lag between the upfront investment in the supply chains needed to install devices and the returns on investment. This means potential investors will be those with a longer-term outlook, attracted by the prospect of consistent returns over time, rather than rapid growth. Investment models should be designed with these investors in mind.
- The Government has acknowledged that local authority approaches to procurement and planning for EV chargepoint infrastructure have varied significantly²¹. Although the location and capacity of chargers will rightly vary according to local need and the structure of the energy grid, the investment structures (such as contract length and management) should be as consistent as possible, with clarity required on whether investors will be formally ‘bidding’ for public contracts or reacting to incentives aimed at scaling up private investment. For investment at scale, institutional investors will want a more consistent framework that allows them to use the same investment models in different parts of the UK. This consistency will also be important to local authorities, as it will

¹⁸ Government modelling estimates that between 280,000 and 720,000 public chargepoints could be required by 2030 – the EV infrastructure strategy indicates a target of “at least” 300,000 public chargepoints (see [EV Infrastructure Strategy](#), p.126)

¹⁹ Source: [Zap Map EV Charging statistics](#), August 2022

²⁰ For example, Connected Kerb recently secured an investment from Aviva Investors of up to £110m, which will support the delivery of up to 190,000 on-street EV chargers ([details here](#))

²¹ UK Government [response](#) to CMA Electric Vehicle charging market study, p.13

allow them predictable funding streams to develop and retain dedicated local resource to maintain this infrastructure.

- Not all chargepoints will have the same frequency of users or as commercially viable, whilst the challenges of connecting some to energy networks will make the up-front investment more costly. Longer-term and stable investment models can help provide funding for infrastructure in areas where the short-term business case is less compelling and minimise the number of chargepoints that are solely funded by public spending.
- There are also some practical challenges to overcome. For example, there is sometimes a mismatch between the need for a long-term lease for the EV chargepoint itself to make it a viable investment and the short-term leases on the site where it is located, such as on retail premises. More broadly, there will be a need to confirm the arrangements for grid connectivity.
- The focus of the Government's EV infrastructure strategy is currently, understandably, on rolling out the installation of new chargepoints as quickly as possible. However, investor confidence will depend also on clear expectations for how the ongoing maintenance and upgrade of this infrastructure will be managed.

Lessons learned from existing infrastructure investment

There is no direct precedent in the UK for the full range of challenges that need to be overcome to scale up EV charging infrastructure investment, with the UK already a leader in this sector (although there is much to learn from the Netherlands' successful rollout of chargepoints²²). However, lessons learned from a range of different sectors could be combined to show how an effective model could work:

- The success of offshore wind shows how complex technology involving deployment of infrastructure at scale, connectivity to energy networks, national policy structures and local/regional decision making can develop into an attractive asset class. The UK now has the largest installed offshore wind capacity in the world, with a further pipeline in construction.
- The sale of the student loan book in 2018 involved creating a new asset class based on packaging together loans of varying seniority, maturity and interest rates. A key part of making these investments attractive to institutional investors was work by the Government actuaries department to create a model that allowed projections of future cash flows. Given that new financial vehicles, such as 'utilisation-linked loans', may form part of a package of new mechanisms to finance EV chargepoint, a similar approach of providing forecasts of anticipated cashflows should be adopted for EV chargepoints.

²² Research by Uswitch places the Netherlands top of a list of the best EU countries to drive an EV, with 24.15 charge stations per 10km² - considerably higher than the next at 6.87 -

<https://www.uswitch.com/electric-car/ev-charging/best-countries-to-own-an-ev/>

- The rollout of high-speed broadband (where the Government is also working towards a 2030 target) is an example of infrastructure where the business case varies significantly by geography. A single Government agency (Building Digital UK) co-ordinates a process of bids by commercial providers, underpinned by a voucher scheme for rural areas where there is unlikely to be a commercial business case for the infrastructure. A similar balance between public and private investment will be needed for EV chargepoints.
- Lessons can also be learned from the successful rollout of contactless payment devices, which required an effective programme of industry co-ordination to understand customer journeys, educate users and support the investment in infrastructure. In this example, the success of certain large-scale schemes (such as TfL and Tesco) provided a 'tipping point' that allowed wider adoption of the new technology.

Enablers of EV Infrastructure

A significant amount of work has already been done to prepare for the rollout of EV charging infrastructure and the financial services sector can work to unlock the investment required and navigate the challenges specific to EV charging infrastructure. Specific considerations include:

- The UK Government is expected to form a single body to co-ordinate the rollout of this infrastructure. Financial institutions have an opportunity to formulate recommendations for the structure of this body and how it will work with local authorities.
- The Green Finance Institute has made a series of recommendations²³ on creating toolkits for local authorities and establishing regional area tendering. These systems are worthy of consideration, to ensure that investment can be scaled up rapidly (rather than this being contingent on the capabilities of individual local authorities).
- In taking forward the EV charging infrastructure strategy, financial institutions should work with Government and local authorities to define a list of potential investment structures to be agreed (which would include mechanisms to link the funding of chargepoints to properties or to enable 'crowdfunding' via consortia of local businesses). Consistency in the models allows these to be bundled up for institutional investors and reduces the burden on local councils or businesses to attract investment on a case-by-case basis.
- Financial institutions could investigate what they would require to forecast short and longer-term cashflows and how it would suit their different risk appetites. This would enable any public funding to be focused solely on those parts of the network for which there is no viable long-term investor appetite.

²³ Green Finance Institute, "[Road to Zero: Unlocking public and private capital to decarbonise road transport](#)", November 2021, p.10

ANNEX 3: Retrofitting Commercial Real Estate - scoping note

The scale of the opportunity, challenge & investment need

The retrofitting of the UK's existing stock of commercial real estate properties is a critical pillar in the effort to meet the goals of the UK Government's Net Zero strategy.

The built environment is a significant contributor to carbon emissions, inclusive of construction and operation (globally, it contributes nearly 40%).²⁴

The UK's non-residential building stock is old, with ~70% constructed before 2000 and ~40% constructed before 1970, which is around the time that thermal regulations were widely introduced.²⁵

As a result, a significant proportion of the property stock exhibits low energy efficiency. For example, 60% of non-domestic rented premises across England and Wales (representing 1.1 million buildings) would fall below the upcoming minimum energy efficiency standards ("MEES") regulations, which stipulate: ²⁶

- As of April 2023, it will be illegal in the UK to let buildings with Energy Performance Certificates ("EPC") rated below E

²⁴ UK GBC - [DEEP DIVE: The Whole Life Carbon Roadmap](#), April 2022.

²⁵ Royal Institute of Chartered Surveyors - [Time to Retrofit: Decarbonising UK buildings and economic recovery](#), November 2020.

²⁶ UK Department for Business, Energy & Industrial Strategy – [THE NON-DOMESTIC PRIVATE RENTED SECTOR MINIMUM ENERGY EFFICIENCY STANDARDS](#), 7 Jan 2020.

- Beginning in April 2027, it is proposed that it will be illegal in the UK to let buildings with EPC ratings below C
- It is proposed that EPC B ratings will be a requirement from April 2030. Those minimum will apply unless a valid exemption has been registered.

Importantly, most of the buildings that will exist in the UK in 2050 have already been built (80% are, according to the UK Green Building Council).²⁷ This means that optimising usage and retrofitting (i.e. reducing operational carbon), rather than carbon intensive new build, will be the main vehicle by which the Transition to Net Zero goals are met.

The investment needed to do so are significant, with the Association of British Insurers (ABI)²⁸ estimating that £200bn will be needed through 2035 in the property sector in order to meet the UK's Net Zero targets; this aligns with the UK Government's Build Back Greener strategy²⁹.

What is retrofitting?

The UKGBC, in an effort to provide increased clarity and consistency for the industry, offers the following definitions of the two main types of retrofit: light retrofit and deep retrofit.

- **Light Retrofit:** focuses on basic remodeling, replacement, or adaptation of existing building elements which tend to focus on a single aspect or feature (e.g., lighting upgrades, optimisation of building controls and operation, etc.).
 - Examples include works involving energy efficient equipment, packaged MEP replacement, and upgrades (fan coil units, radiators, pipes, etc.)
 - These works are generally considered to be limited in their disruption to tenants (can remain in operation) and can be carried out with minimal shutdowns of building power.
- **Deep Retrofit:** focuses on significant works of size or scale that result in a fundamental change to the building structure and/or services. This can be represented as a collection of light retrofit enhancements or individually disruptive measures, such as major plant replacement, which usually comes with a higher capital requirement. Depending on the scope, works of this type would typically require consent from property stakeholders (leaseholds, etc.) and sometimes would be subject to permissions from local authorities.
 - Examples include works to substructure (insulation of floors and retaining walls), superstructure, including façade and roof elements (increased air tightness, windows, and thermal bridges), and central MEP upgrades (efficient air handling units, replacement of boilers, and improvements to riser insulation).
 - These works can be a collection of light retrofit enhancements or individually disruptive measures, such as major plant replacement, which usually comes with a higher capital requirement.³⁰
 - A deep retrofit should be considered as having such an impact on a building structure/use as to require the asset to be fully vacated before starting the works.

Retrofitting is distinct from better property management and performance optimization, which incorporates data to define a baseline and devising actions plans as well as implementing smart

²⁷ UK Green Business Council – [Climate Change](#).

²⁸ Association of British Insurers [ABI-climate-roadmap](#)

²⁹ [HM Government Net Zero Strategy: Build Back Greener](#)

³⁰ UK Green Business Council - [Delivering Net Zero: Key Considerations for Commercial Retrofit](#), May 2022.

building technology. Retrofitting generally requires higher capital investment and works being carried out.

Potential challenges & barriers to investment

In some cases, the retrofit of an existing building will not create significant additional carbon emissions through refurbishment works and the resulting energy efficiency gains for the building will make the asset very attractive to tenants and could lead to rental premiums. In these cases, investing in the retrofit is clearly attractive for equity investors and real estate lenders alike and the market has seen examples of this type of refurbishment already completed.

However, the focus of this paper is on the larger portion of the market where there are barriers to achieving such outcomes. The main barriers to financing retrofitting are:

- Unsatisfactory rate of return of certain retrofit investments / Difficulty to assess a rate of return
The high costs of deep retrofits for non-domestic buildings will be one of the main challenges to investment, especially because in some cases the cost to retrofit could be a significant percentage of the value, which makes commercial decisions for property owners difficult. Additionally, scaling up retrofits at a portfolio level is a challenge especially when assets are located in different geographical regions.
- Availability of capital to (re)finance assets to be retrofitted in particular for deep retrofit on non-income generating assets
When investing in retrofit projects, capital providers need to consider how their debt will be serviced. Not all retrofit work that is necessary will increase cash flows at the properties. Although tenants are likely to benefit, it will often be the case that the tenants are unwilling to shoulder cost of investment through increased rents. Indeed, much of the work will be needed to keep the building lettable and meet interim Government milestones in terms of EPC ratings, etc. Additionally, most commercial properties already carry some form of mortgage debt and as such it is not always obvious where the additional revenue streams will come from to service the additional burden.
- Lack of cooperation between landlords and tenants
The relationship between landlords/owners and tenants is also an important consideration where incentives are sometimes mismatched. The costs of retrofits are often borne by the property owner and the benefits, for instance lower energy or heating bills, are often realized by the tenant. Conversely, when leases are structured as full repairing and insuring ("FRI"), the incentives are flipped. The tenant is responsible for all of the costs for repairs and insurance for the property being leased from the landlord in FRI leases and thus would bear the burden of retrofit works. Working together and aligning the competing incentives in commercial property on a win-win basis for landlords and tenants is the first priority.
- Owner/occupier collaboration and availability of energy consumption data
While the UK's open EPC registry is one of the most open and accessible in the world, relying on EPC's alone is insufficient in the transition to Net Zero due to limitations in data availability and the frequency at which they are refreshed. As the operational performance of an asset significantly depends on the way the tenant operates it, it is crucial for landlords to have access to actual energy consumption data that is regularly updated. This enables landlords to understand the level of investment and steps needed to be taken in order to improve the energy efficiency of a building. A great example of legislation that enables data sharing between owners and occupiers is the French binding legislation 'Le Décret Tertiaire' (The Tertiary Decree). The decree sets a mandatory decrease in energy consumption for all existing commercial buildings of more than 1,000sqm. In achieving this reduction target, landlords and tenants need to disclose annual energy consumption

data for each asset on a platform (OPERAT platform) each year.³¹ This approach has the potential to help commercial sector to overcome one of the biggest challenges that owners are currently facing in meeting their Net Zero commitments.

- Net Zero skills shortage and lack of supply for current low carbon technology
The transitioning to a low carbon economy depends both on the availability of green skills and the pace at which the current technology can be scaled up. Investment in a net zero future could support up to 700,000 jobs by 2030 and 1.7 million by 2030, half of which are likely to be located in the North, Midlands and Scotland.³² A skills shortage could delay UK's net zero ambitions and a barrier for decarbonising CRE.

Additionally, the impact of the current macroeconomic environment and especially rising interest rates must be considered moving forward. A higher rate environment could discourage some pools of capital (insurance companies, for instance) from investing in large scale retrofit projects where returns are becoming less attractive, and this could in turn slow down or delay the Net Zero transition.

Lessons learned from existing infrastructure investment

The work surrounding residential retrofit can provide a helpful basis for the roll-out of incentive programmes for commercial buildings.

The UK Government's Green Homes Grant Scheme ("GHGS") for example aims to reduce the cost burden of energy efficiency renovations and provides owners with vouchers for up to a third of the investment in insulation, heat pumps, or solar thermal heating systems.

Scaling up an initiative such as this for larger commercial retrofit would contribute positively to the meeting of the UK's Net Zero goals. An example of an incentive of this type could be a retrofit tax reduction scheme (tax breaks on buildings that carry out retrofit works or hit certain energy efficiency benchmarks). Additionally, policies such as an energy-adjusted Stamp Duty Land Tax (SDLT) to drive demand for energy efficiency works, much like the one the UKGBC and GFI advocated for the residential market, could be considered as well.³³

The US Department of Energy operates the Property Assessed Clean Energy (PACE) model for financing energy efficient and renewable energy improvements on private property including commercial properties. This program allows a property owner to finance the up-front costs of energy or other eligible improvements on a property and then pay the costs back over time—typically 10 to 20 years—through property assessments, which are secured by the property itself and paid as an addition to the owners' property tax bills. These assessments are tied to the property and can be transferred through a change of ownership, addressing a key disincentive to investing (unable to recover the upfront costs if an owner does not stay in the building long enough). The PACE model has to date mobilised over \$9.8 billion in financing towards energy efficiency improvements across 323k homes and has created over 140k skilled jobs³⁴. Property-Linked Finance, which takes some of the principles highlighted above, is in the process of being developed in the UK alongside various market participants.³⁵

Enablers of Retrofitting Commercial Real Estate

The scale of the commercial property retrofit challenge makes it clear that there will be no "silver bullet", or one size fits all answer.

³¹ [Le Décret Tertiaire](#)

³² [Net Zero Factsheet - Environment APPG briefing](#)

³³ Green Finance Institute - [Letter to Chancellor of the Exchequer](#), 16 September 2021.

³⁴ US Department of Energy - [Property Assessed Clean Energy Programs](#)

³⁵ Green Finance Institute – [New research shows UK appetite for innovative financial products to enable energy-efficiency upgrades and reduce energy bills](#), 6 September 2022.

The financial services sector can work to rapidly scale the investment required and navigate the challenges specific to retrofitting commercial real estate. Specific considerations include:

- Work with the UK Government to articulate a long term, stable approach to the sector, including using its expertise to make policy recommendations that will provide confidence to capital providers, help to unlock demand and also prime the pump for further investment.
- Improve the availability and accessibility of real-time emissions data will be another key component of meeting Net Zero goals. A system that obligates tenants to share actual energy emissions data will help to improve environmental performance while making the pathway towards Net Zero clearer on a property-by-property basis. Similar disclosure policies have been put in place in France and the UK Government could use these laws as guidelines.
- Stronger coordination and collaboration will be key between local authorities, Government, and financing providers of all kinds to help foster and grow the retrofit market. Financing providers can promote the creation of public-private partnerships and explore private sector financing solutions to help deploy funds, whether in the form of debt, equity, or a mix, on a sufficiently large scale to tackle the transition challenge. Indeed, the reputational benefits of financing providers becoming more involved and innovative in the retrofit space as it relates to the Net Zero transition can be another powerful driver.
- The increased coordination and collaboration also includes emphasizing the possible opportunities and non-emission related benefits to the transition. This is a major investment program which, if managed well, can have strong economic benefits throughout the UK including the potential creation of tens of thousands of new jobs dedicated to the transition according to the Construction Industry Training Board.³⁶

³⁶ UK Climate Change Committee – [The Sixth Carbon Budget](#), December 2020.

