Securing the UK's role as a green financial hub

Contents

Acknowledgments

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Back to contents

Executive summary

In the Ten Point Plan for a Green Industrial Revolution (November 2020), the Prime Minister Boris Johnson announced his ambition to make the UK the global centre of green finance. This followed the UK's commitment in 2019 to achieving net zero carbon emissions by 2050.

The Green Financing Framework was developed in June 2021 and the government reaffirmed its commitment to "much needed" infrastructure investment through the mainstreaming of green finance products, most notably the UK's first sovereign green gilt expected to be issued in 2021.

However, much more is needed to accelerate the growth of green finance and achieve net zero. Ahead of COP26 in Glasgow in November, Cornwall Insight and TLT sought to analyse stakeholder views on the UK's prospects of securing its role as a green finance hub, and the associated policy and regulation.

We asked what more is needed – from the government and other key stakeholders – and how the UK can drive environmentally-friendly financial decision making and the growth of green finance options. We also discussed how the UK can channel more private capital into renewables projects and technologies by making these assets more bankable.

Key findings

Coordination

- Given its traditional position as the world's most prominent international financial centre and its increasing leadership in the fight against climate change, the UK government needs to coordinate policy and stakeholders across sectors and regulators.

Leadership and policy

- The UK government needs to show leadership in what it is championing domestically and through its support for international progress towards net zero.
- To bridge the gap between rhetoric and action, the government must design and implement ambitious policies and regulatory frameworks that can tackle the myriad of challenges accompanying net zero, especially in hard-to-abate sectors such as transport and heat.

Credibility

- In an environment where trust in green regulation will be paramount, the UK's reputation for regulatory integrity and sound legal principles has to be preserved.
- The government must appoint credible teams that can engage with and understand markets and draw the right conclusions to design practicable solutions.

Data

- Businesses will require immediate access to both retrospective data and forward-looking information about the strategies of other organisations.
- It is essential that the UK can enable effective opportunity management as well as risk management.

Climate-related disclosures

- Mandating disclosures across the entire UK economy by 2025 will play a key role in effectively tackling greenwashing, which is key to the UK maintaining its credibility.
- While this is certainly a positive step, all companies – especially small and medium sized enterprises – must be equipped with the proper tools to produce meaningful reports.
- The government must ensure that investors can access and understand mandatory disclosures and appoint experts to monitor the quality of data as time progresses.

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UK taxonomy

- An alignment with the definitions in the EU taxonomy could assist with the free movement of capital, however the UK could consider deviation from the EU's position where necessary.

Sustainability-linked products

- The UK's upcoming sovereign green bond, albeit small compared to other EU countries, is an important step as the sovereign issuances will greatly enhance the UK's reputation as a green hub. However, more and larger issuances are needed.
- Slow-to-grow consumer markets such as green mortgages will require strong incentives for price-sensitive customers, and to give issuers more certainty over demand so they can innovate.

Subsidies/incentives for investing in renewable generation and technologies

- While Contracts for Difference (CfDs) significantly contributed to the UK's installed low-carbon electricity generation, a holistic approach towards reforming the existing electricity market is needed to take account of increasing levels of intermittent renewable generation and ensure the right investment signals.
- Low carbon mobility, heat and energy storage are critical to net zero but to date the lack of clarity over future revenue streams has prevented adequate investment in these sectors. The Subsidy Control Bill could be a catalyst for the deployment of these newer technologies, closing the viability gap and placing them on the same footing as more established technologies such as onshore wind and solar.

Back to contents

Chapter 1: Mapping the green finance landscape

Green finance fundamentals

Green finance is a phenomenon that combines economic growth with environmental protection and the delivery of a net zero economy. As defined by the UK government's 2019 Green Finance Strategy, green finance is about "aligning private sector financial flows with clean, environmentally sustainable and resilient growth".[1]

This concept integrates two partially overlapping principles. "Financing green" involves channelling private capital into renewable energy projects and clean technologies, while "greening finance" is about integrating the material risks and growth opportunities from environmental and climate change factors into mainstream financial decision-making.

Figure 1: Defining ESG principles

Environmental: aligns economic activities with climate change concerns and the general integrity of our planet.

Social: incorporates the implications the economy has on human societies and the wellbeing of individuals.

Governance: embeds ethical concerns into the strategies and internal structures of businesses.

> "It is inevitable that green finance will become finance, and that all finance will have to become green over time

Prashant Vaze, Senior Policy Fellow, Climate Bonds Initiative

"It is inevitable that green finance will become finance, and that all finance will have to become green over time," says Prashant Vaze, Senior Policy Fellow at the Climate Bonds Initiative.

Environmental, social and governance (ESG) principles are important when considering green finance (see Figure 1) and there are a variety of motivations behind the increasing penetration of ESG principles into finance. While some asset managers, investors and lenders actively want to contribute towards impact-related social or environmental goals, others adopt ESG principles to manage risks, anticipate regulatory actions and access new economic opportunities.

As ESG regulations are set to become more stringent, these factors are fundamentally changing the global financial landscape to incorporate elements that have otherwise been relatively neglected in recent decades.

1 https://www.gov.uk/government/publications/green-finance-strategy

Back to contents

International landscape

Growing recognition of the looming climate crisis has resulted in several major international policies, which have contributed to making the conversation around green finance more mainstream.

The launch of the United Nations (UN) Environment Programme Finance Initiative in 1992 marked one of the first global initiatives to link sustainability with financial practices.[2] Over a decade later, the Principles for Responsible Investment (PRI) were set up to act as a holistic guide for responsible investment practices in line with six core principles, and has almost 4,000 signatories to date.[3]

Another crucial multi-stakeholder initiative to tackle global sustainability is the 2030 Agenda for Sustainable Development launched in September 2015. It defined 17 global Social Development Goals (SDGs) to promote growth alongside social issues and the protection of the planet.[4] While all the SDGs present implicit environmental dimensions, at least seven goals have strong environmental features.

Within two months of adopting the SDGs, the Paris Climate Agreement was negotiated at COP21 and was subsequently ratified by over 180 UN states.[5] Signatories committed to keeping global temperature increases to well-below 2°C and towards 1.5°C above pre-industrial levels, and agreed to submit national emission targets every five years.

These inter-governmental agreements are non-binding, but they have created strong market signals prompting action from the private sector. The Financial Stability Board set up the Task Force on Climate-Related Financial Disclosures (TCFD) in 2015 as a vehicle to promote voluntary and consistent climate-related financial disclosures to improve understanding around the material risks associated with climate change (see Chapter 2).[6]

BlackRock's CEO, Larry Fink, issued a letter to its shareholders in 2020 to signpost that sustainability is at the heart of the firm's investment strategy. It challenged the companies BlackRock invests in to disclose climate-related risks in line with the TCFD's recommendations.[7] Another letter was issued in 2021, which reaffirmed this position and illuminated how ESG-aligned portfolios had enjoyed a "sustainability premium" over the previous year, meaning they outperformed their parent benchmark.[8]

While there are plenty of examples of these types of commitments, both letters are revealing because they show the private sector is in some instances becoming as proactively engaged as policymakers in embedding environmental factors into finance.

In January 2021, HRH Prince of Wales launched the Terra Carta initiative as a defining set of principles for the private sector to adopt in order to become more sustainable by 2030.[9] It includes commitments to protect biodiversity and further the ambitions of achieving net zero by 2050, and a goal to mobilise $10bn towards natural capital by 2022. Its objective is to put "nature, people, and the planet at the heart of global value creation," thereby broadening the scope of finance to include non-human stakeholders.

> The Dear CEO letter shows that the private sector is becoming as proactive as policymakers in ensuring that environmental factors are embedded in finance.

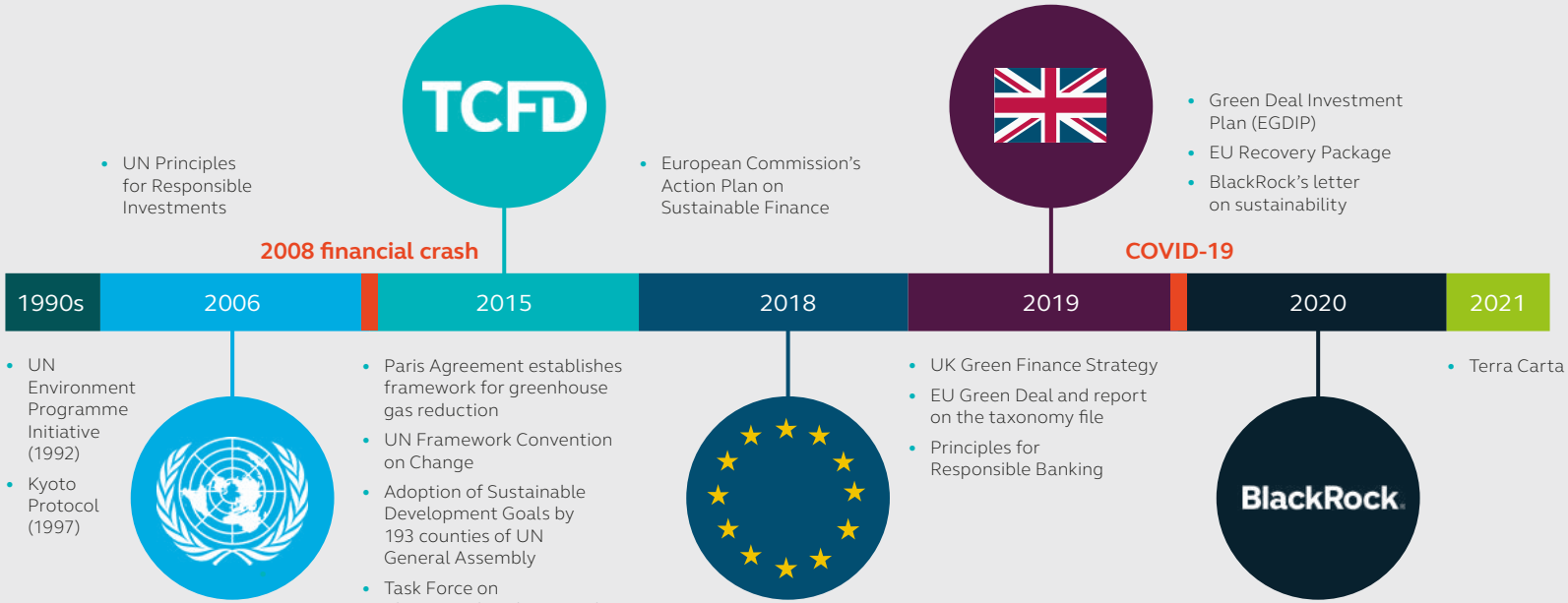
2 https://www.unepfi.org/
3 https://www.unpri.org/
4 https://sdgs.un.org/goals
5 https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement
6 https://www.fsb-tcfd.org/
7 https://www.blackrock.com/corporate/investor-relations/2020-larry-fink-ceo-letter
8 https://www.blackrock.com/corporate/investor-relations/larry-fink-ceo-letter
9 https://www.sustainable-markets.org/terra-carta/

UK landscape

Within this international context, the UK has made moves to cement itself as a financial hub for green finance. In 2008, the Climate Change Act placed the UK on a trajectory to reduce its greenhouse gas emissions by at least 80% from 1990 to 2050, underpinned by a framework of five-year carbon budgets.[10] Largely due to the rapid decarbonisation of the power sector, by 2019 the UK was able to cut its emissions by 45% since 1990, while growing its economy by almost 80% (see Figure 3 on following page).

The UK government amended the Climate Change Act in 2019 at the recommendation of the Climate Change Committee (CCC) to the more ambitious target of net zero by 2050, making the UK the first G7 country to enshrine net zero in law.[11] The government has recently committed to a statutory target to cut emissions by 78% by 2035 compared to 1990 levels and to ensure that the sixth carbon budget takes into account emissions from international shipping and aviation.[12]

Figure 2: Evolution of main ESG developments



Source: Cornwall Insight

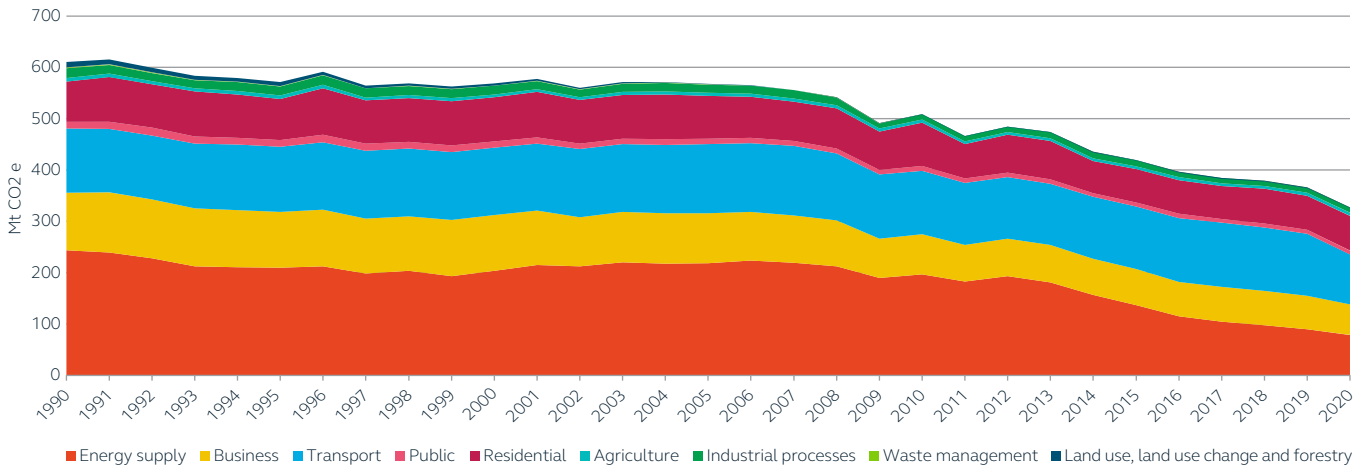
10 https://commonslibrary.parliament.uk/research-briefings/cbp-8666/

11 https://www.legislation.gov.uk/ukdsi/2019/9780111187654

12 https://www.gov.uk/government/news/uk-enshrines-new-target-in-law-to-slash-emissions-by-78-by-2035

Back to contents

Figure 3: Changes in UK emissions by sector



Source: BEIS

Financial flows need to be aligned with environmental goals to keep the country on its net zero trajectory. A crucial step was the publication of the Green Finance Strategy. The document laid out plans to increase the availability of capital for green assets and implement initiatives to align the financial sector with environmental objectives. Due to be updated in 2022, the strategy includes:

- The greening of the financial system;
- The mobilisation of capital into clean growth; and
- Capturing the opportunity of the transition to net zero.

At the end of 2020, the UK released several notable policy papers to provide a long-term pathway for net zero. This included the Ten Point Plan for a Green Industrial Revolution, the National Infrastructure Strategy and the Energy White Paper.[13] Combined, they set out a blueprint to make the UK a global leader in low carbon economies and position finance as a key enabler for this vision.

For these ambitious policy frameworks to be credible, one interviewee said the government must show leadership in what it is championing because supporting international progress towards net zero is a "mixture of what you do domestically and whether you put the money where your mouth is." For example, the proposed small coal mine in Cumbria, which may seem small in global emission terms (~10m tonnes per year), is not small in credibility and is inconsistent with the UK's international environmental agenda.[14]

13 https://www.gov.uk/government/publications/energy-white-paper-powering-our-net-zero-future; https://www.gov.uk/government/publications/the-ten-point-plan-for-a-green-industrial-revolution; https://www.gov.uk/government/publications/national-infrastructure-strategy

14 https://councilportal.cumbria.gov.uk/ieListMeetings.aspx?CommitteeId=124

To bridge this gap between rhetoric and action, the government must develop policy and regulatory frameworks that can tackle the multiple challenges accompanying net zero – especially in hard-to-abate sectors such as transport and heat – and instigate action that channels private capital towards clean and resilient growth.

For the government to effectively lead change, policy should be rigorously informed by industry concerns. Action to encourage industry participation is supported by the Council for Science and Technology's (CST's) open letter to the government in January 2020, which outlined how a whole-systems approach may be used to provide a framework for the energy transition.[15] The CST's recommendations include:

- Strengthening the institutions, governance frameworks and leadership structures needed across central government to galvanise action to achieve net zero;
- Developing the analytical capability, flow of information and reporting needed to inform decisions; and
- Maximising the contribution of technology, mobilising financial systems and galvanising international collaboration.

In respect to the third element, the government has committed to cement Leeds and London as global financial hubs. Josephine Bush, Owner at JRB Consulting, says, "London is one of the leading financial centres globally and contains some of the greatest financial minds with a very reputable stock exchange and regulatory environment". These advantages equip the UK with incredibly strong foundations to boost innovative finance, which the government intends to accelerate with a £10m investment in two new research hubs in Leeds and London. Both cities will provide data and analytics to banks and private firms internationally to support the integration of climate-related factors into financial decision-making.[16]

The government is certainly feeling the heat with regard to the vast scale of net zero ambitions, with criticism from the CCC on 24 June 2021 for being "too slow" and riddled with "uncertainty and delay" regarding its new climate strategies.[17] The CCC said the government is taking a "high-stakes gamble" by focusing everything on a new Net Zero Strategy in the autumn, adding that "it is absolutely critical that the new strategy is published before the COP26 climate summit, with clear policy plans, backed fully by the Treasury."[18] While lockdown-related measures have led to a decrease in UK emissions, the CCC stated that "delayed plans" on surface transport, hydrogen and biomass must be delivered, and an ambitious Heat and Buildings Strategy that works for consumers is urgently needed.

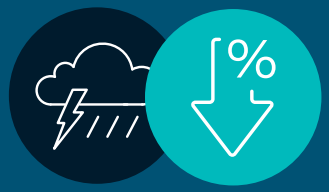
UK Centre for Greening Finance and Investment hubs

15 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/910446/cst-net-zero-report-30-january-2020.pdf
16 https://www.gov.uk/government/news/leeds-and-london-set-to-become-global-centres-of-green-finance
17 https://www.theccc.org.uk/2021/06/24/time-is-running-out-for-realistic-climate-commitments/
18 Ibid

Chapter 2: Aligning finance with net zero goals

Physical and transitional risks

Today, many firms are taking a more holistic approach to investment that drives positive change, produces long-term sustainable returns and insulates against climate-related risks.



The risks associated with climate change and a low carbon economy are typically defined as “physical risks” and “transitional risks”

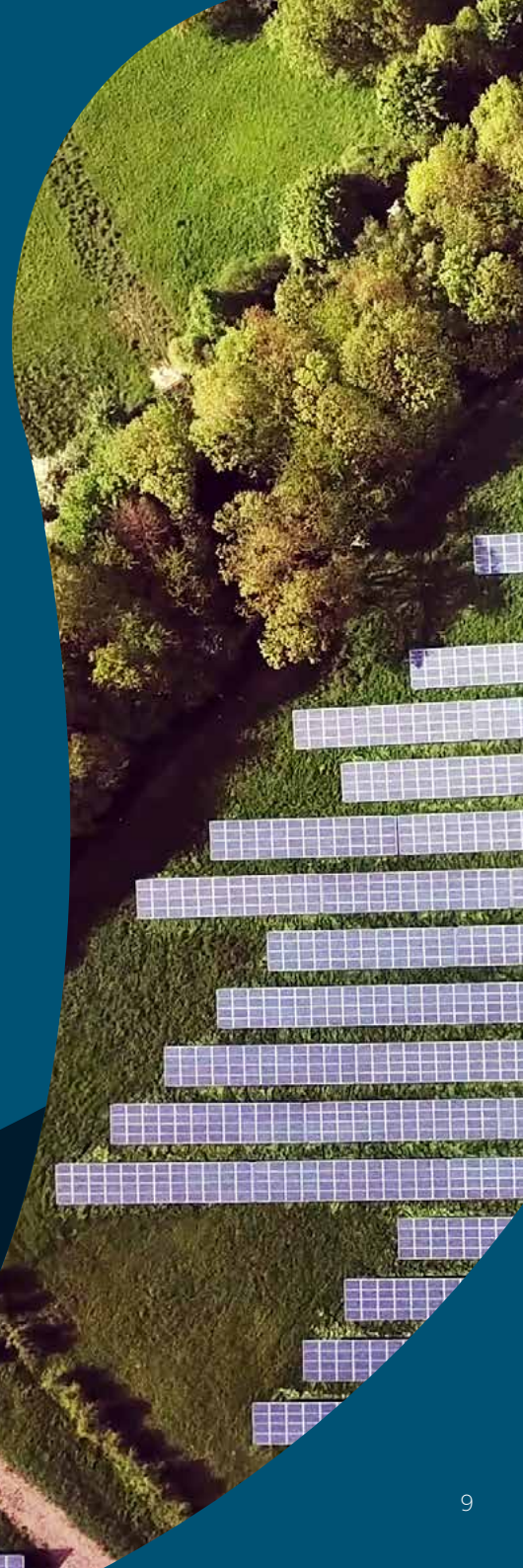
The risks associated with climate change and a low carbon economy are typically defined as “physical risks” and “transitional risks”. Physical risks are associated with the increasing severity and frequency of climate and weather-related events on asset classes and portfolios. A physical risk, for example, could directly damage infrastructure, change seasonal demand or indirectly disrupt supply chains. The result is reduced asset value and future low profitability for banks, assets owners and other financial institutions and non-bank lenders.[19] The Bank of England has reported that 10% of the value of mortgage exposures across England are from properties in flood-risk zones.[20]

Case study

The Bank of England has begun to implement a robust stress test of the ability of UK-based financial institutions to manage climate-related risks. The so-called 2021 Biennial Exploratory Scenario (Climate BES) aims to test the resilience of the largest banks, insurers and the financial system to different climate pathways, therefore presenting a holistic assessment of the UK financial system’s exposure to both physical and transitional risks.

Transitional risks, on the other hand, refer to macroeconomic risks, including changes in technology, policy and regulatory and consumer sentiment that could prematurely devalue an investment or create stranded assets. This may be due to unanticipated reductions in demand, a shift in consumer preference, increasing liabilities resulting from environmental damage (e.g. carbon taxes) or other factors that could require the reassessment of asset values and the creditworthiness of some borrowers.

If both types of risks are properly understood by industry – particularly carbon-intensive industries – some economic actors may be compelled to switch to low carbon technologies to future-proof their long-term growth.



19 https://www.fsb.org/2020/07/stocktake-of-financial-authorities-experience-in-including-physical-and-transition-climate-risks-as-part-of-their-financial-stability-monitoring/

20 https://www.bankofengland.co.uk/prudential-regulation/publication/2020/climate-related-financial-disclosure-2019-20

While long-term risk management has great utility, Bush is concerned that for larger organisations there is currently too much emphasis on risk and not enough on opportunity. "We need to move away from risk management to opportunity management. And we need policy to support it meaningfully, whether it's through blended finance, public private partnerships or other forms of incentive (subsidy or tax incentives) for innovation." Companies should consider how they can generate opportunities to foster growth, how and where they can potentially innovate, and how they can mobilise capital to support those innovations.

> We need to move away from risk management to opportunity management. And we need policy to support it meaningfully, whether it's through blended finance, public private partnerships, or other forms of incentive (subsidy or tax incentives) to support innovation.
>
> **Josephine Bush, Owner, JRB Consulting**

Governance

A growing number of UK organisations are attempting to develop robust governance frameworks that define the internal rules and processes to manage and mitigate climate risks. Emissions reduction targets are the clearest example of this, whereby a company publicly commits to the goal of achieving net zero by a certain date. This may include increasing the percentage of investments aligned with net zero indexes at a portfolio level or simply switching to a renewables-based supplier.

To assist corporations in integrating environmental factors into their governance structures, the World Economic Forum attempted to create a set of guiding principles in 2019. These include establishing climate accountability on boards, ensuring that the board reflects the diverse skillset necessary to tackle these issues, and that climate considerations inform long-term strategic investment and planning. They also recommend that any material implications of climate change are assessed and disclosed on an ongoing basis, and that boards ensure executive schemes are aligned with climate-related targets.

Figure 4: TCFD pillars

Governance: disclosing the organisation's governance and oversight around climate-related risks and opportunities.

Strategy: disclosing the actual and potential impacts of climate-related risks and opportunities on the organisation's strategy and financial planning.

Risk management: disclosing how the organisation identifies, assesses and manages climate-related risks.

Metrics and targets: disclosing the metrics and targets used to assess and manage relevant climate-related risks and opportunities.

Source: TCFD

> The market is moving in a certain direction, and if you're not moving with it, investors can withdraw their investment or use their proxy voting power to force change, even at board level.
>
> **Josephine Bush, Owner, JRB Consulting**

Shareholders may choose to hold companies to account through active ownership by voting on resolutions that promote change at an investee company. In March 2021, ShareAction and several institutional investors filed climate change resolutions that secured HSBC's commitment to phase out its financing of coal by 2030 in the EU and OECD and by 2040 elsewhere.[21] In June 2021, a tiny activist hedge fund named Engine No. 1 won three seats in ExxonMobil's twelve-member board, and secured a resolution to force fuller disclosures of the company's lobbying. With a relatively small ownership stake at just 0.02%, Engine No. 1 has promised to use these seats to "Reenergize Exxon" into clean energy.

Watershed moments like this have sent ripples across the economy. As summarised by Bush, "The market is moving in a certain direction, and if you're not moving with it, investors can withdraw their investment or use their proxy voting power to force change, even at board level."

The Bank of England has also incorporated an internal governance strategy to understand and mitigate financial risks resulting from climate change across all of its activities. This includes assigning an Executive Sponsor for climate-related risks, whose responsibilities include recommending strategies for mitigating climate change risks and ensuring this is discussed by the Court of Directors and Audit and Risk Committee.[22]

The Prudential Regulatory Authority of the Bank of England has set out a list of demands for banks and issuers to embed long-term approaches within existing governance structures that identify and manage financial risks from climate change.[23] It expects firms to set up dedicated roles within the board and its relevant sub-committees for managing climate-related risks, and to apply stress testing and scenario analysis to inform risk identification and management.

Mandatory disclosures

As mentioned in Chapter 1, the TCFD was designed to improve the transparency and pricing of climate-related risks and in 2017 it released a series of recommendations for climate-related financial disclosures across four pillars. These recommendations have become industry standard and have aided businesses in better understanding, disclosing and mitigating against their exposure to physical and transitional risks. They also generate useful learnings that can be disseminated across the economy.

> The scale of the challenge requires businesses to have immediate access to both retrospective data and forward-looking information about the strategies of other businesses.

To increase the quantity and quality of disclosures, the UK government has mandated listed companies and large asset owners to disclose in line with the recommendations by 2023 and across the economy by 2025.[24] Emma Harvey, Director at the Green Finance Institute, believes this could "catalyse action within these institutions" and ensure continuity over the long term to mitigate the risk of stranded assets.

Mandatory TCFD-aligned disclosures have enormous potential, according to Prashant Vaze, because it is currently difficult for financial industries to comprehend their own liabilities and exposure to climate risks without their counterparties (i.e. the businesses they interact with) reporting as well. "It is no good just expecting and waiting for voluntary initiatives," he says. The scale of the challenge requires businesses to have immediate access to both retrospective data and forward-looking information about the strategies of other businesses, particularly high-emitting sectors that are trying to ensure their capital is not stranded in several years.

21 https://shareaction.org/resolutions-2021/

22 https://www.bankofengland.co.uk/-/media/boe/files/annual-report/2020/climate-related-financial-disclosure-report-2019-20.pdf

23 https://www.bankofengland.co.uk/-/media/boe/files/prudential-regulation/policy-statement/2019/ps1119.pdf

24 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/972422/Consultation_on_BEIS_mandatory_climate-related_disclosure_requirements.pdf

According to Bush, as more data comes to light, industry will gain a rich insight into how decisions are made off the back of disclosures. This will drive meaningful engagement among investors who will suddenly have access to the strategic journeys of their counterparties.

> Once this data becomes available, the UK must ensure that investors fully understand it and that it is accessible.

Once this data becomes available, the UK must ensure that investors fully understand it and that it is accessible. Supporting evidence put forward by the CCC suggests that some organisations are struggling with aspects of reporting, such as the financial impact of global warming.[25]

Similarly, it is important that this data accurately reflects the intensifying complexity of the energy market, which has been increasingly penetrated by a multitude of different actors and is now characterised by the proliferation of intermittent disaggregated renewable generation. In this regard, TCFD initiatives may not be as effective without the necessary expertise to monitor the quality of the data and reporting to ensure businesses are adequately prepared for climate change.

Another consideration raised by Paul Cannings, Senior Partner at YFM Equity Partners, is that disclosure requirements should be appropriately scaled for small and medium-sized enterprises (SMEs) to ensure they reflect what SMEs can realistically do, measure and report. Smaller businesses make up the majority of businesses across the country and have less resources than larger organisations to manage these risks, with many severely impacted by Covid-19. There is a risk that by making disclosures mandatory for SMEs, it becomes a "boilerplate" box-ticking exercise. There should be good practice and sharing amongst businesses and global leaders to furnish SMEs with appropriate tools and resources, especially as they are the most likely to be impacted by extreme weather and flooding.[26]

The SME Climate Hub, launched in late 2020, seeks to address this problem. Its mission is to act as a "one-stop-shop" for SMEs to assess the physical and transitional risks for understanding climate-related impacts. While independent initiatives like this are useful, the question remains whether more government intervention is needed to ensure all types of SMEs with different requirements can access these tools.

25 https://www.theccc.org.uk/publication/2021-progress-report-to-parliament/
26 Ibid

Tackling greenwashing

The definitions attached to terms such as “sustainability”, “net zero” and “green” are ambiguous and can vary depending on who is interpreting them. “Greenwashing” is the term used to describe business activities or projects improperly labelled as environmentally sustainable.

As highlighted by Cannings, it can be challenging to differentiate between those companies that have merely committed to reducing their impact on the planet and those that have a robust implementation framework in place. The disclosure requirements are useful as they demonstrate whether a company is executing its strategies in line with its stated aims.

Bush says, “There’s a huge reputational risk for organisations not following through on their strategies. Legally, now we’re seeing courts intervene to enforce change.” For example, in a recent landmark case a court in the Netherlands ruled that Shell must cut its CO2 emissions by 45% compared to 2019 to ensure that its policies align with the Paris Agreement. While the ruling applies to the Netherlands, it sets a precedent that is likely to cross borders.

> “There’s a huge reputational risk for organisations not following through on their strategies. Legally, now we’re seeing courts intervene to enforce change.
>
> **Josephine Bush, Owner, JRB Consulting**

UK taxonomy

To tackle greenwashing and help investors, asset managers and rating agencies navigate green finance and the myriad accompanying definitions, policymakers propose to implement a UK taxonomy. The classification system would create a common set of standards and labels for the types of assets and activities that are environmentally sustainable to aid stakeholders in screening activities that are genuinely sustainable and exclude those that are not. The UK taxonomy will make it easier for debt issuers and investors to frame their goals and activities and distinguish themselves from those that invest in unsuitable activities or do not meet basic environmental standards.

UK standards will be developed by a Technical Expert Group and loosely aligned with the EU taxonomy, which defines sustainable activities as those that contribute to at least one of six stated environmental objectives and do not significantly harm the other five (see Figure 5).

Figure 5: The six taxonomy environmental objectives

1. **Climate change mitigation**
2. **Climate change adaptation**
3. **Sustainable use and protection of water and marine resources**
4. **Transition to a circular economy, waste prevention and recycling**
5. **Pollution, prevention and control**
6. **Protection of healthy ecosystems**

Source: European Commission

> “The EU taxonomy is a useful reference because it is an outcomes-based form of regulation, which avoids the rigidity of rules-based prescriptive regulation and can provide flexibility against the ever changing net zero landscape.
>
> **Imogen Benson, Associate, TLT**

"The EU taxonomy is a useful reference because it is an outcomes-based form of regulation, which avoids the rigidity of rules-based prescriptive regulation and can provide flexibility against the ever changing net zero landscape", says Imogen Benson, Associate at TLT. On the other hand, Prashant Vaze points out that the UK taxonomy should not be so loosely defined that it attracts polluting industries; otherwise, it will risk undermining the credibility of financial initiatives and be tarnished as a form of greenwashing.

Vaze also says the UK should not compete on definitions with the EU, rather on the underlying investment and skills of the investment managers. After all, London is home to many fund managers that interact with EU markets, with the UK capital being the second largest investment management centre after New York, with around £1.3trn managed.[27] These firms will be required to abide by UK-based laws and therefore it is necessary to make these definitions as regionally sensible as possible, so that capital can move freely between the UK and the EU and other international markets. The UK should not radically diverge from how the EU defines certain green assets. "The UK taxonomy is likely to mirror the EU's, and that would make sense because you don't want two parallel systems, particularly for international organisations," adds Bush.

Benson noted that it is difficult to define what green is and to "have a fool-proof method whereby nothing can slip through the cracks." This is evident in the recent controversy over the inclusion of nuclear power and natural gas in the EU taxonomy. Many have argued their inclusion is necessary as "transition fuels", while others say it could legitimise greenwashing by companies that are investing in allegedly unsustainable practices.

27 https://www.theia.org/sites/default/files/2020-09/20200924-imsfullreport.pdf

Sustainable financial products

Sustainability-linked products that raise capital for activities and projects with environmental benefits are crucial for the transition to a net zero economy.

Green bonds

First issued by the European Investment Bank (EIB) in 2007, green bonds are exclusively used to finance or refinance projects, in full or in part, that are contributing to the environment. For example, projects that improve energy efficiency, decarbonise transport or build wind farms. The use of proceeds for green bonds are pre-determined and verified.[28] Issuers may use them to signal to the wider market that they have implemented a meaningful strategy to address environmental risks, while investors can use them to finance projects with a positive environmental outcome. While small sustainability projects are doing well from these types of bonds, the market has not yet found many routes to expand.

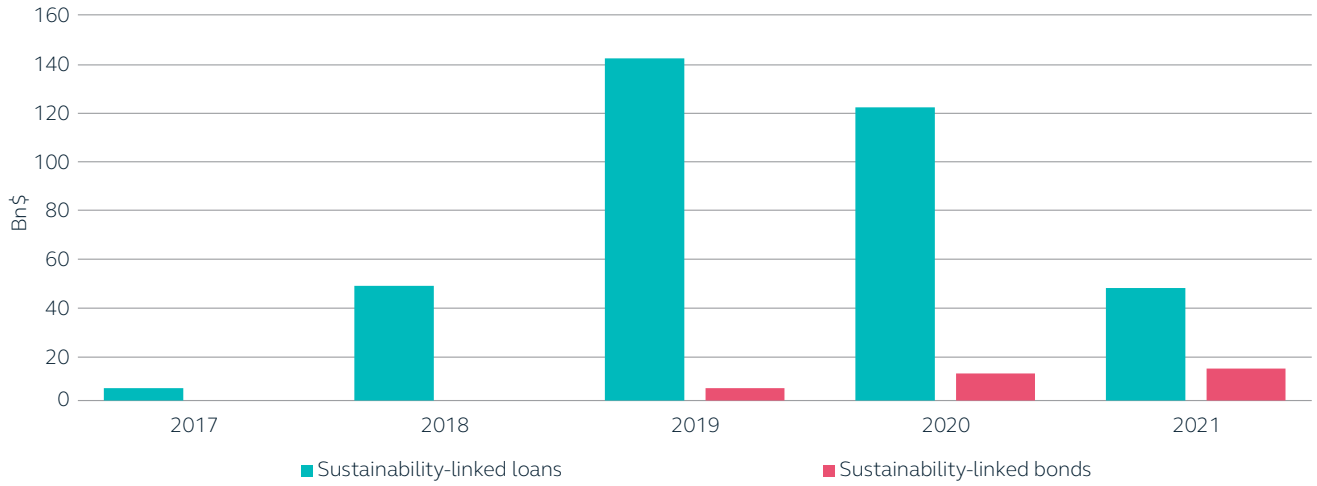
Green loans and sustainability-linked loans

Green loans are used for a specific green project and include a use of proceeds requirement. Alternatively, sustainability-linked loans are tied to the borrower's environmental impact in which the use of proceeds can be used for any general corporate purpose. They incentivise the borrower to meet ambitious predetermined sustainability performance targets – such as a reduction in greenhouse gas emissions – for example by offering a reduced interest rate. Unlike green bonds and green loans, the flexibility in proceed use helps hard-to-abate sectors and smaller businesses obtain sustainable finance while they transition away from fossil fuels.

"If defined correctly, sustainability-linked products are crucial because they will allow investors to feel confident, knowing their investments are contributing to the green future we're trying to finance. It is pivotal that investors, asset managers and banks see the inevitability of switching their financial strategies towards assets that have a long-term future, which tend to be renewable assets," says Vaze. However, more work needs to be done to ensure that nature and reducing biodiversity loss are key elements of green finance and incorporated into net zero targets.

> If defined correctly, sustainability-linked products are crucial because they will allow investors to feel confident, knowing their investments are contributing to the green future we're trying to finance.
>
> **Prashant Vaze, Senior Fellow, Climate Bonds Initiative**

Figure 6: Global issuances of loans and bonds linked to sustainability performance targets



Source: S&P

28 https://www.icmagroup.org/sustainable-finance/the-principles-guidelines-and-handbooks/green-bond-principles-gbp

Throughout the last decade, green bonds have grown in popularity, with the UK expected to issue its first green bond in 2021. These securities have also been resilient, with issuances increasing in 2020 compared to 2019 despite the economic downturn caused by Covid-19 lockdown measures. Harvey at the GFI described green bonds as the "poster child of the green finance landscape" over the last decade. In her opinion, not only have they helped catalyse wider green markets by trickling down into other sustainability-linked products, but when they are linked to initiatives such as the Green Bond Principles, they have provided investors with a degree of certainty and transparency over the greenness of their investments.

> Sovereign issuances of green bonds generally provide domestic markets with greater respectability and mandates as bookrunners.
>
> **Emma Harvey, Director at the Green Finance Institute**

The issuance of the UK's green gilt is important, she adds, because sovereign issuances of these bonds generally provide domestic markets with greater respectability and mandates as bookrunners, which will help upscale the UK's domestic green bond markets. The retail investment element is also notable as green gilts provide an opportunity to engage with the public, thereby ensuring retail investors can meaningfully contribute towards net zero.

Green bonds have been increasingly issued by large corporates, which is important for their mainstreaming as large corporates use the debt-capital markets to raise much of their finance, says Vaze. Ontario Teacher's Finance Trust issued a €750m 10-year green bond in late 2020, guaranteeing that the proceeds will be allocated to environmentally sustainable assets that tackle climate change.[29] These sustainability-linked products also have a dual-use both as primary financial instruments and for refinancing purposes. Small issuance of green bonds, for example, can be used for refinancing as they can be packaged and then offered in debt capital markets for green bonds.

The UK's upcoming sovereign green bond is "very small by reference to the volumes that we've seen in Germany, France and other EU countries," according to Gayatri Desai, Managing Director at CIBC. If the UK government is seriously committed to green finance, it needs to "move up that trajectory very quickly." The concern is that while the UK is very well positioned to be a green finance hub, "It could start to lose ground if it does not get some of these key initiatives buttoned-down and out there." Indeed, the UK has long been slow on green bond issuance, ranking 12th in Climate Bonds Initiative's annual 2020 figures behind the US, China and a host of other European nations.[30]

> The UK's upcoming sovereign green bond is very small by reference to the volumes that we've seen in Germany, France and other EU countries.
>
> **Gayatri Desai, Managing Director, CIBC**

In June 2021, the government's Green Financing Framework stated that HM Treasury intends to follow up the first sovereign green gilt with a series of further issuances "to build out a green yield curve".[31] The same report also mentioned the upcoming launch of Green Savings Bonds via National Savings and Investments (NS&I), the retail savings organisation of the government, to allow individuals to back green projects and mainstream green finance products.

29 https://www.otpp.com/news/article/a/ontario-teachers-finance-trust-issues-inaugural-green-bond

30 https://www.climatebonds.net/

31 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1001023/20210630_UK_Government_Green_Financing_Framework.pdf

Green mortgages

Green mortgages are also registering an intense growth in the UK market, used to match the enormous funding requirement to get homes to higher energy performance standards by the mid-century. According to the CCC, £250bn is needed by 2050 to upgrade homes and install low carbon heating options.[32]

> One of the current barriers to growth in the green mortgage market from a lender's perspective is pricing; green mortgages are often not the cheapest product offered and customers tend to be price-driven.
>
> **Robin Penfold, partner, TLT**

To fund this requirement, banks have started offering aspiring homebuyers green mortgages, which provide the debtor with preferential terms if they can demonstrate the property meets certain environmental standards, such as having an Energy Performance Certificate (EPC) rating of A or B. If the applicant is successful, they may receive lower interest rates or a larger loan.

Barclays, for example, has used the proceeds from its green bonds to finance and refinance mortgages for properties in the top 15% of the lowest carbon intensive properties, based on EPC data.[33] Energy efficient homes free up a household's available income as they are spending less on their utilities, thereby lowering the risk of defaulting on their mortgage repayments if they are exposed to an unexpected increase in expenditure or decrease in income.

Another important aspect to consider is that one in five UK households rents from a private landlord.[34] Green mortgages for buy-to-lets could incentivise landlords to purchase properties that are energy efficient or make green improvements to their existing properties. The upshot is that the property requires less energy to heat it, thereby lowering utility bills for tenants and freeing up their ability to pay rent.

According to Robin Penfold, Partner at TLT, one of the challenges facing green mortgages is that customers tend to be interest-driven and price-driven; green mortgages are not always the cheapest option. UK mortgage advice rules may be ill suited in this regard, as they make it harder for mortgage advisers to take into account a customer's environmental aims if the resulting product is not the cheapest. The challenge from a regulatory and policy perspective is to incentivise homeowners to retrofit their homes, which would give issuers certainty in demand for new financial products and greater urgency to innovate.

Despite these challenges, the Intermediary Mortgage Lenders Association found that almost three quarters (74%) of lenders expect demand for green mortgages to grow over the next few years, with 13% reporting a rise in enquires since the pandemic. [35]

Fintech

There is increasing interest in the role of financial technology (fintech) in green finance. This has the potential to improve the pricing of environmental risks and opportunities, the measurement and tracking of ESG criteria and the research process. Broadly speaking, fintech combines the fast-paced, abundant and cheap data created by information technology with financial services to produce new business models, processes and financial instruments. The UN Environment Programme has identified several use cases for fintech, including pay-as-you-go resource utilities, flexible energy supply and demand and renewable energy peer-to-peer trading. Fintech also provides a means to refine ESG reporting, benchmarking and rating in a more standardised and comparable way that also improves the accuracy of the data for investors and asset managers.

32 https://publications.parliament.uk/pa/cm5801/cmselect/cmenvaud/346/34605.htm
33 https://www2.lseg.com/sustainablefinance/Guide-to-green-finance/download
34 https://www.generationrent.org/about_renting
35 imla-green-mortgages.pdf

Chapter 3: Financing the energy transition

Who pays for net zero?

Another key part of the UK government's Green Finance Strategy is "financing green", which involves channelling private capital into renewable energy projects and clean technologies.

1-2%

The Energy Transitions Commission estimates that net zero will require incremental capital investments over the next 30 to 40 years at around 1% to 2% of global GDP per annum.[31]

£50bn

In the sixth carbon budget, the UK's CCC estimates that spending needs to increase five-fold from £10bn in 2020 to around £50bn in 2030, costing between 0.5% and 1% of GDP.[32]

Given how capital intensive the energy transition is going to be, attracting investment into low carbon technologies and sustainable infrastructure projects is more necessary than ever.

Clean energy generation assets have proved particularly attractive to institutional investors, given their features in terms of returns, risks, resilience to macroeconomic downturns and cashflow. However, there are significant differences between subsidised operational and subsidy-free assets. Today, new-build projects not only include development and construction risk, but subsidy-free development also creates challenges around security of revenue. Conversely, subsidised operational assets offer reliable cashflow and are seen as lower risk due to their predictable returns

In recent years, capital inflows into the clean energy sector have led to a fiercely competitive environment, because of the relative shortage of bankable projects. This mismatch between the abundance of capital and a shortage of projects has led to an increase in asset prices and a decrease in returns.

Back to contents

Figure 7: Renewables scheme comparison

	ROC	FiT	CfD
Type of support	Certificates (ROCs) sold to suppliers to show renewable supply	Government-set tariffs for generation (differs by tech and scale)	'Top-up' against reference wholesale price
Capacity accredited	30GW	6.3GW	3.8GW operational 9.1GW
Support length	20 years	20 years (25 for early solar)	15 years (35 years for nuclear)
Programme length	2002 – 17 Support expires for last station in 2037	2010 – 19 Support expires for last station in 2039	2014 – ?

Source: Cornwall Insight

Alejandro Ciruelos, Managing Director Renewable Energy at SDCL, explained that while there is more capital available, it is chasing the same de-risked projects. Projects without the features that have historically made the clean energy sector attractive are struggling to get the same level of attention.

As the age of traditional subsidies is coming to an end across the more established technologies, the availability of projects with contracted revenues has diminished on a relative value basis compared to only a few years ago.

However, net zero is driving the market forward and there is a significant pipeline of new projects without subsidies. One of the challenges is matching these projects to a viable debt solution, and this is leading investors to adopt bolder investment strategies. In some cases, investors are increasingly moving upstream, in the sense of assuming degrees of development risk. But they are also becoming more eager to consider emerging technologies that were deemed too risky until recently.

"Investors have to accept different risk profiles. Rather than fixed return Feed-in Tariff/CfD assets, we've got a range of different assets with differing risk profiles and rising interest rates and inflation. The energy sector is more interesting than it's been for many years and different investors will target different opportunities," says Matt Hammond, Partner at Foresight Group.

Another challenge – driven by this recent increase in generation assets – is new risks arising from wholesale market price volatility and price cannibalisation. The depressive effect of intermittent wholesale prices can deter investors from deploying capital, weakening financial incentives to build new capacity. This has triggered a debate about whether the current market design is fit for purpose.

There is also a growing trend to invest in the companies behind generation assets. This clearly demonstrates the extent to which investors are getting more comfortable with higher levels of risk. "Private equity investors are starting to shift away from buying projects and are instead looking at funding and building companies that then invest in projects.

They're starting to understand that there is a greater value to the team than just the project," explains Ciruelos.

For example, in December 2020 Canada Pension Plan Investment Board (CPP Investments) established Renewable Power Capital Limited – a UK-based platform that will invest in solar, onshore wind and battery storage, among other technologies, across Europe.

Channelling capital towards mature technologies: routes to market

The UK is particularly well placed to retain a competitive advantage in the next wave of renewables development. For developers in particular, one of the key advantages of the UK market is the transparency and straightforwardness of the planning process. "The speed with which applications can be turned around makes the UK a more attractive place to invest in solar. In the UK, for a sub 50 MW project you know you'll usually have a determination in ~6-9 months depending on the complexity of the site and the LPA, whereas in other European markets there are more steps to follow and things could take over three years," says Martina Flanagan, Development Director at Cero Generation.

Back to contents

Different low carbon generation technologies have different risk profiles, with solar and onshore wind – and increasingly offshore wind – considered to be established technologies and cost-competitive with fossil fuels.

Despite the scale of investment in established low carbon generation to date, huge levels of investment are still required for the UK to reach net zero. National Grid's Future Energy Scenarios find that at least 3GW of wind and 1.4GW of solar capacity needs to be built every year from 2020 until 2050.[36] To put this into context, Cornwall Insight's Benchmark Power Curve for Q1 2021 forecasts 1.3GW in solar PV capacity between 2021 and 2030.

3GW & 1.4GW

National Grid's Future Energy Scenarios find that at least 3GW of wind and 1.4GW of solar capacity needs to be built every year from 2020 until 2050.

The UK's operational subsidised assets will hit their peak in 2026 and then begin to slowly wind down. Taking into account re-gearing on operational sites to extend asset life beyond the subsidy period and the development of new subsidy-free sites, there will be a considerable number of projects looking for viable and scalable business models to ensure cost competitiveness and attractiveness to investors. Contracts for Difference (CfDs), corporate power purchase agreements (CPPAs) and merchant risk modeling are all options to consider.

Contracts for Difference

CfDs have been hailed as a UK success story, particularly in driving down the costs of offshore wind and attracting a wide range of global investors.

With the Department for Business, Energy & Industrial Strategy (BEIS) confirming the reintroduction of Pot 1 (established technologies like solar PV and onshore wind) for Allocation Round (AR) 4 (with applications due to open in December 2021), the government plans to secure double the capacity procured in AR3, meaning they may secure up to around 12GW of capacity. However, the government's offshore wind ambition is likely to see a large proportion of the 12GW target allocated to Pot 3 (restricted to offshore wind).

While the auction parameters are still to be confirmed, competition is building up and more sites will become eligible before round kick-off. Flanagan explains the impact that CfDs could have on subsidy-free investment and the wider market: "The downside of a competitive CfD market is that there will invariably be a number of successful projects that then need an alternative route to market. For many, waiting two years for the next CfD auction with no certainty is not an option.

"The other concern is the message that high levels of competition send to investors. Flooding the market in this manner can mean securing capital at more favourable rates, but investor margins may suffer. That said, the uptick for subsidy-free generation is the push that a competitive CfD auction may give to the development of funding models, especially as high levels of liquidity mean that funders are looking for routes to deploy capital beyond investment in subsidised assets. Adapting risk metrics and the acceptance of risks that would have been considered excessive until recently could be the trigger needed to unlock debt funding for subsidy-free investments."

Overall, while CfDs significantly increased the UK's installed generation, the government should take a holistic approach to reforming the existing electricity market, to take into account the increasing levels of intermittent renewable generation and ensure the right investment signals.

Corporate Power Purchase Agreements

Another route to market is CPPAs. These are bilateral contracts between a generator and a corporate (the offtaker), whereby the corporate makes fixed payments to the generator over a period of time to acquire clean energy. Described by Guy Lavarack, Investment Director at Blackfinch, as "the next best thing to a subsidy", one of the key benefits of a CPPA for the generator is that it locks in power prices over the CPPA's duration and provides certainty to lenders by guaranteeing long-term revenue streams for debt repayments. The length of the contract is also likely to provide the offtaker with room to negotiate the best available price.

Guarantees of Origin will also support ESG credentials. With net zero high on the agenda, this is a significant driver for corporates – signalling to the market that they are purchasing 100% renewable energy directly from a generator and delivering against ESG objectives. Amazon recently mooted its plans to commit to buy 1.5GW of production capacity from 14 new solar and wind plants around the world as part of its push to purchase enough renewable energy to cover all of the company's activities by 2025.[37]

36 https://www.nationalgrideso.com/future-energy/future-energy-scenarios/fes-2020-documents

37 Amazon and Other Tech Giants Race to Buy Up Renewable Energy - WSJ

Flanagan explains that, in the UK, the developer is working to fill the huge appetite from corporate offtakers. “The big corporates are looking for ways to source green power; and smaller organisations are moving in this direction as well, so demand outreaches supply of quality projects at the moment.” However, in order for a CPPA to be viable and bankable, it needs to be underpinned by the financial solidity of the offtaker.

Similarly, Hammond observes that while there are “a lot of cashed up corporates, not just tech giants” under pressure from different stakeholders to invest in green energy, really long-term CPPAs are unlikely to become a mainstream solution covering the majority of generation. He adds that “most companies aren’t going to sign up to a 20-year PPA the way an old Renewables Obligation Certificate (ROC) or Feed-in-Tariff was, but you will get multi-year agreements that will certainly help to balance revenue streams. What it’s not going to do is provide you with long-term contractual certainty if you’re looking for a 35-year lifetime for your assets.”

Merchant financing

Against this backdrop, merchant financing is going to play an important role in delivering the capacity required for net zero. Lavarack estimates that “the lion’s share of projects will have to embrace merchant risk and therefore the debt funders will need to get comfortable with this model as well.” That may not be as much of a stretch as previously envisaged. In his view, “banks will move on this, especially where investors can offer comfort to funders that the risks are well understood and well managed and have flexibility to drive revenue.”

> “It is likely only a matter of time before lenders become comfortable with merchant risk in the UK.
>
> **Martina Flanagan, Development Director, Cero Generation**

Merchant models to finance clean energy projects can include varying degrees of additional support. This term is usually used in the context of unlocking funding for subsidy-free projects, however the merchant model can also apply to re-financing or financing subsidised projects. In this case, the project receives subsidies for a certain period of a contract, followed by a merchant ‘tail’. Lavarack observes that projects “lucky enough” to be awarded a CfD can mitigate and alleviate the wider merchant risk. Still, partially and especially fully merchant projects are particularly high risk, chiefly because of the uncertainties related to wholesale electricity prices, which still make them unpalatable for most lenders.

> “The types of products that are being developed on the institutional side are more hybrid debt equity products as opposed to just pure debt products, which is really interesting.
>
> **Alejandro Ciruelos, Managing Director Renewable Energy, SDCL**

While the direction of the market is clear, merchant projects remain challenging from a lender perspective. Flanagan says there are very few lenders issuing debt based on merchant projects in the UK at the moment. Still, it is starting in mainland Europe, so it is likely only a matter of time before lenders become comfortable with merchant risk in the UK, particularly as there are already elements of merchant risk within existing operational ROC projects. Likewise, Ciruelos has observed efforts by debt investors to innovate, adopting ground-breaking strategies to get merchant projects off the ground. “If debt finance is not coming from banks, it’s coming more from institutional capital. The types of products that are being developed on the institutional side are more hybrid debt equity products as opposed to just pure debt products, which is really interesting.”

UK Infrastructure Bank

In the past, interventions by public financing institutions including the former Green Investment Bank and EIB have helped to leverage private finance and scale up sectors including the offshore wind industry. The newly established UK Infrastructure Bank is now hoped to play a role in getting projects off the ground, especially when financing less established technologies.

“If done well, it could play a really good role in bringing forward some of the new technologies and supporting newer areas of decarbonisation …its aims are very good,” Hammond observes.

While investors are generally confident that the new multilateral could help fill the financing gap, they also hope that the institution will not compete with private sector investment.

Channelling capital towards less established technologies

Less established and more innovative technologies are set to play a key role in achieving net zero. The UK government's Ten Point Plan outlines its ambition to leverage public and private sources of finance and increase investment in research and development (R&D). Having committed to raising total R&D investment to 2.4% of GDP by 2027, the £1bn Net Zero Innovation Portfolio aims to accelerate the commercialisation of low carbon technologies, systems and processes in the power, buildings and industrial sectors by focusing on ten priority areas, several of which are considered in this report.

Generation

The CCC has said that the scale of the net zero challenge requires the deployment of emerging technologies such as carbon capture, utilisation and storage (CCUS) and hydrogen. By 2030 the government aims to have CCUS deployed across four industrial clusters, with the capacity to capture 10MtCO2 annually, as well as an active CCUS power plant and CCUS contributing to a target of 5GW of low carbon hydrogen production. It has consulted on a CfD scheme to support industrial CCUS projects.

> The scale of the net zero challenge requires the deployment of emerging technologies such as carbon capture, utilisation and storage (CCUS) and hydrogen.

While the government has set out plans to test, deploy and scale up emerging technologies such as hydrogen, questions remain on the extent to which the existing network is fit for purpose. For instance, what proportion of hydrogen can be safely injected into the grid to households and businesses and what might be the relative contributions of the different types of low carbon hydrogen in a future energy system? While small-scale trials of hydrogen blending with natural gas indicate that up to a fifth of hydrogen can be safely integrated into the gas grid, only 0.1% of the gas in Britain's network of pipelines is permitted to be hydrogen, by law. Such long-term political and regulatory risks are particularly complex to price into investors' calculations.

> The near-term focus around industrial clusters is "a big area where the government can make some early wins"

CIBC's Robert Todd advises that the near-term focus around industrial clusters is "a big area where the government can make some early wins." To have some of those projects reaching financial close in the mid-2020s will go a long way to giving a huge amount of confidence in the UK's direction. On hydrogen, Todd explains, "We're very much at an exploratory stage; what does a hydrogen purchase agreement (HPA) look like compared to a PPA? These are exciting areas that do remain quite young."

With the announcement of the Subsidy Control Bill in June 2021, those required revenue models may not be as far a stretch as previously thought. Indeed, for newer technologies that have viability gaps – such as CCUS and hydrogen – the Bill could be the catalyst needed to support the development and funding of these areas.

Mobility

Decarbonising mobility is crucial to reach net zero. Despite the increasing number of electric vehicles on the road, charging infrastructure is still evolving into an infrastructure asset class in its own right. The major issue is that revenue streams and long-term cash flows are still uncertain, given the charging-points-to-demand risk equation. Electric vehicle charging infrastructure (EVCI) is still largely perceived as an equity play, with limited project finance opportunities. However, institutional investors are closely monitoring this space, with breakthrough deals such as the 2019 stake investment in Pod Point by Legal & General (L&G). In March 2020, Triodos Bank UK provided finance to support the development of EV charging with a loan to Pod Point, with TLT advising on the transaction.

The UK has been a pioneer in the mobilisation of private capital into electric mobility through government initiatives such as the Charging Infrastructure Investment Fund. The UK's electric mobility space is clearly heating up, with Iduna raising £4m for EV charging in Manchester in just six days in April with support from public investors via Abundance Investment.

Heat

The decarbonisation of heat is another key priority. Heat networks are systems of insulated pipes that take heat and cooling generated from a central source and distribute it to a number of domestic and non-domestic buildings. They are particularly attractive in denser urban areas, and work well for new build developments and campuses, and for some more rural off-gas grid communities. They can reduce emissions from heating and help consumers to reduce energy bills.

14,000

Currently, there are more than 14,000 heat networks (12,000 communal and 2,000 district) supplying ~0.5m households in the UK

Currently, there are more than 14,000 heat networks (12,000 communal and 2,000 district) supplying ~0.5m households in the UK.[38] While heat networks currently provide ~2% of UK heat demand, the CCC has estimated that with government support, they could provide 18% of heat demand by 2050 in a least-cost pathway to meeting carbon targets.

According to BEIS, up to £16bn of investment is necessary for heat networks to fully contribute to net zero. The Heat Networks Investment Project – a £320m government funding programme – aims to increase the number of heat networks being built, deliver carbon savings and help create the conditions necessary for a sustainable heat network market. However, this must be supported by private investment.

> So far, the investor community has been cautious.

So far, the investor community has been cautious. For projects to be viable they must be pooled together to realise economies of scale. Alternatively, investors need to capitalise by developing localised infrastructure projects that combine heat networks with other infrastructure or real estate assets they already own.

One example of the creation of synergies between existing assets and investments in low carbon technologies is L&G's partnership with Kensa. L&G's retirement housing business (Inspired Village) was looking for the optimal heating solution for its first operationally net zero Retirement Living development and selected Kensa ground source heat pumps. L&G Capital has also invested in Kensa directly to support the business and scale up the delivery of low carbon heat pumps manufactured in the UK. Such partnerships are suited to institutional investors that would not engage directly with consumers as part of a heat supply contract, for example, given issues surrounding consumer credit risk. As Foresight's Matt Hammond observes, "Good heating projects tend to have contracts with credible counterparties to purchase heat for a long term, or credible demand that's easy to assess."

One thing that would help increase investor confidence is a regulatory framework – particularly if this framework looks similar to regulated utilities such as telecommunications and water. A potential funding model could be the Regulated Asset Base, although this could lead to an increase in costs for today's limited number of consumers. Since one of the key obstacles for the heat sector is a lack of scale, the creation of a strong infrastructure pipeline would allow investors to strategically deploy capital into the sector. Local authorities could also be pivotal in the development of a UK-wide infrastructure pipeline.

Overall, the challenges associated with investing in heat networks are related to the limited sizes of individual projects, whether that is at the household, street or district level. Hammond explains, "But when you do get them off the ground, they tend to be quite small." Indeed, while many of these projects are actually fundamentally quite sound, "You can't scale up your effort in the same way you can with solar or wind." Unless economies of scale can be realised, the effort and learning required to bring these projects to the fore is at odds with the scale of the outcome. Moreover, Hammond notes that realising economies of scale for heat networks could be complicated by an evolving regulatory landscape.

> One thing that would help increase investor confidence is a regulatory framework

Desai explains that "Heating is the second largest source of UK emissions, and to meet net zero targets ~27m homes will have to be converted to low carbon heating. Given the diversity of housing stock in the UK and associated costs and disruption, the green retrofitting of homes represents a huge challenge". The recent International Energy Agency recommendation that no new gas boilers are sold or installed from 2025 presents a particular challenge as well. Installers will require access to consumers' properties in order to install low carbon technologies, which could be disruptive and costly.

"There is certainly a lot of noise around senior debt financing for new low carbon technology. Strong sponsorship and the creation of viable offtake markets through the establishment of revenue models will be key to the bankability of these projects," observes Desai.

38 Hydrogen blending – what is it and why does it matter? – Energy Networks Association (ENA)

Multi-tech projects: the role of energy storage

Energy storage is essential to the energy transition as it can effectively integrate into the grid, increasing levels of intermittent generation. Specifically, exposure to unpredictable and volatile wholesale markets can be offset by additional and diversified revenues through contracting with distribution network operators to provide a source of flexible power generation and participation in the Capacity Market. Multi-tech projects that combine battery storage with established technologies (solar PV or onshore wind) and are well understood from a technical and commercial perspective can help to mitigate the risks associated with single projects that rely solely on intermittent sources.

While this space is generally considered reserved for equity investment, given the greater risk, the revenue streams available to such flexible assets will help support a project's bankability. TLT's Head of Clean Energy and Real Estate, Maria Connolly, confirms that there are a number of banks already looking at routes to market – though for those first-of-a-kind projects this is likely to be on a case-by-case basis until development modelling matches bank risk.

In anticipation of the potential revenue opportunities for multi-technology assets, developers are future proofing their solar projects with the addition of energy storage – either built in from the outset or with the option to add it on later.

Martina Flanagan of Cero Generation, a portfolio company of Macquarie, is progressing multi-technology projects in the UK and elsewhere, noting "you get more bang for your buck." Once a connection has been secured, it is important to use as much of that capacity as possible, and co-location or multi-technology projects can facilitate this. At the same time, critical mass plays a key role in a project's bankability, whether that is across the UK, Europe or globally.

Another significant challenge for developers is regulatory uncertainty, as it is still difficult to say whether the best investment opportunity lies in front-of-the-meter or behind-the-meter storage. The network necessitates utility-scale front-of-the-meter storage, with carbon-intensive baseload capacity being decommissioned and superseded by intermittent generation. However, behind-the-meter storage is important for customers willing to decrease their demand in order to manage load.

To investors, behind-the-meter storage provides smaller returns and limited scale, but offers revenue stacking opportunities and more visibility over the long term. While front-of-meter storage can offer higher returns and larger scale, it is still deemed a less certain investment proposition.

Interesting models are appearing in the storage sector, with at least some form of underwriting on the offtake. This means there can be a utility with a creditworthy investment grade covenant behind it, which can underwrite at least a certain level of revenue. Therefore, even a relatively small revenue floor can materially de-risk and materially increase the amount of debt that can be deployed into these types of assets.

Back to contents

Chapter 4: Outlook

The UK's net zero targets, as well as the major policy documents published at the end of 2020, have provided investors, developers and lenders with a degree of reassurance about its direction of travel.

However, while the UK's ambitions are clear and the rhetoric is loud, it is universally acknowledged that the journey to net zero and green finance becoming mainstream will be long and challenging. Other markets are competing just as fiercely as the UK to be recognised globally as a leading green finance hub and to attract the world's green investment capital, and are reporting impressive results.

At the same time, numerous obstacles stand in the way of generating sufficient supply and demand for green finance options. While many of these are not unique to the UK, they do demand bold solutions to ensure the UK can capitalise on its favourable starting position and compete with other markets.

- The government's rhetoric has raised industry's expectations ahead of COP26. Many will have high hopes that their optimism will be matched by practicable solutions that force or incentivise progress.
- The coronavirus pandemic has negatively impacted many sectors, potentially making those businesses and consumers more price-sensitive, which could threaten the growth of green finance. Yet, it has also highlighted the need for a green recovery, and created an opportunity to make relatively bold decisions to deliver against the UK's ambitious targets. The government must ensure it creates a fair and inclusive market in which everybody can participate.
- The drive for green finance will come from in-market as well as external pressures, but the policy and regulatory framework is key – in particular mandatory reporting and the UK taxonomy. Environmental principles have risen up the boardroom agenda; now, the data that will drive the UK forward and inform major financial decisions needs to come in behind this head of steam. The credibility of that data now and on an ongoing basis will be essential.
- Green finance will eventually become finance, and all finance will be green. So it follows that today's outliers will find it increasingly difficult to stand out, which may drive an increase in awareness campaigns and greater innovation in new green financial products.
- Overall, there are few doubts that the UK market remains one of the best energy infrastructure investment propositions globally, thanks to a highly developed and competitive market, a stable and investment-friendly regulatory framework and a thriving investor and advisor community. Hence, it is imperative that the country retains its position as one the leading global hubs for capital markets and investment, by ensuring the stability and reliability of its legal and regulatory frameworks.
- The Subsidy Control Bill is an encouraging development, which could accelerate deployment of newer technologies that have a viability gap – such as CCUS and hydrogen. However, more clarity as to how it will impact business models and revenue streams is needed, particularly as we may be about to enter a macroeconomic environment characterised by rising interest rates and inflation.
- The UK must keep on attracting global investors, including institutional investors, looking to remain competitive in a rapidly evolving market. Developing innovative funding mechanisms and products that allow open market access will be key in the coming months.

Back to contents

About Cornwall Insight

Getting to grips with the intricacies embedded in energy and water markets can be a daunting task. There is a wealth of information online to help you keep up-to-date with the latest developments, but finding what you are looking for and understanding the impact for your business can be tough. That's where Cornwall Insight comes in, providing independent and objective expertise.

You can ensure your business stays ahead of the game by taking advantage of our:

- Publications – Covering the full breadth of the GB energy industry, our reports and publications will help you keep pace with the fast moving, complex and multi-faceted markets by collating all the "must-know" developments and breaking-down complex topics
- Market research and insight – Providing you with comprehensive appraisals of the energy landscape helping you track, understand and respond to industry developments; effectively budget for fluctuating costs and charges; and understand the best route to market for your power
- Training, events and forums – From new starters to industry veterans, our training courses will ensure your team has the right knowledge and skills to support your business growth ambitions
- Consultancy – Energy market knowledge and expertise utilised to provide you with a deep insight to help you prove your business strategies are viable

For more information about us and our services contact us on enquiries@cornwall-insight.com or contact us on 01603 604400.

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Back to contents

About TLT

For what comes next

TLT is a UK law firm delivering strategic and day-to-day legal support across the green finance market.

As a full service commercial law firm with regional, national and global reach, we support clients with their ESG strategies, including the UK's major banks, building societies, fintechs, investment funds, asset managers, private equity and venture capital firms, pension funds and corporates.

We specialise in the clean energy; digital; financial services; leisure, food & drink; real estate; retail & consumer goods; and public sectors, offering tailored, commercial advice rooted in experience.

We advise on EU and UK green finance policy and regulation through our involvement with organisations such as the Green Finance Institute, Aldersgate Group and UK Finance.

Able to advise across the three UK legal jurisdictions of England & Wales, Northern Ireland and Scotland, TLT has six UK offices in Bristol, London, Manchester, Glasgow, Edinburgh and Belfast.

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Back to contents

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