

INVESTOR REPORT | February 2017

Banking on a Low Carbon Future

AN INVESTOR GUIDE FOR ENGAGING
WITH BANKS ON CLIMATE CHANGE



ShareAction»

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Abbreviations

- AUM – Assets Under Management
- b – Barrel
- BAML – Bank of America Merrill Lynch
- BBVA – Banco Bilbao Vizcaya Argentaria
- BEI – Banking Environment Initiative
- BNI – Bank Negara Indonesia
- CBI – Climate Bonds Initiative
- CCS – Carbon Capture and Storage
- CDP – Carbon Disclosure Project
- CFA – Chartered Financial Analyst
- CHP – Combined Heat and Power
- DCF – Discounted Cash Flow
- ESG – Environmental, Social and Governance
- FCA – Financial Conduct Authority
- FRC – Financial Reporting Council
- FSB – Financial Stability Board
- GABV – Global Alliance for Banking on Values
- GHG – Greenhouse Gas
- GRI – Global Reporting Initiative
- ICBC – Industrial and Commercial Bank of China
- IEA – International Energy Agency
- LGIM – Legal & General Investment Management
- mmBtu – One million British Thermal Units
- NDC – Nationally Determined Contribution
- NGO – Non-Governmental Organisation
- IPO – Initial Public Offering
- KPI – Key Performance Indicator
- LBO – Leveraged Buyout
- LNG – Liquefied Natural Gas
- M&A – Mergers and Acquisitions
- OBOR – One Belt, One Road
- PPP – Public-Private Partnership
- PRA – Prudential Regulation Authority
- R&D – Research and Development
- SDGs – Sustainable Development Goals
- SMEs – Small and Medium-sized Enterprises
- TCFD – Task Force on Climate-Related Financial Disclosures
- UNEP FI – United Nations Environment Programme Finance Initiative
- VaR – Value at Risk
- V20 – Vulnerable 20

Foreword by Lauren Compere, Boston Common Asset Management

Lauren Compere is Managing Director and the Director of Shareholder Engagement at Boston Common Asset Management, an employee-owned investment management firm specialising in US and international responsible investing. She oversees Boston Common's global shareholder engagement initiatives. Ms. Compere has worked in the responsible investment industry for over 25 years. She sits on the Governing Board of the Interfaith Center on Corporate Responsibility (ICCR) and serves on the Business Ethics Committee for the International Corporate Governance Network (ICGN).

Limiting global warming to less than a 2 degrees Celsius rise requires a major shift in the way we operate financially and economically. We need to dramatically reallocate resources, and develop and adopt cleaner, more efficient technologies. The funding requirements for such an undertaking are immense and require the determination and power of investors, large asset owners, and public and private banks.

As climate risk becomes recognised as critical to banks, investors want to know whether this risk is being managed well and at the highest levels of the organisation. For example, are the world's biggest banks incorporating top level corporate assessments of the potential effects of climate change on their loan portfolios, or adopting policies and governance systems to comprehensively manage climate-related risks? And are they offering products and services that support the transition to a low carbon economy?

Boston Common's 2015 report *Are Banks Prepared for Climate Change* assessed the practices and long term management of 45 global banks on ten climate performance metrics. The study concluded that there remains a huge divide between the global financial sector's current practices and its potential to be a catalyst to transition to a low carbon future. Our 2017 update report *On Borrowed Time: Banks & Climate Change* highlights that while there has been some progress, including the adoption of more sector specific restrictions and the increased use of carbon assessment tools (carbon footprinting, environmental stress tests, economic scenarios), the sector as a whole is not keeping pace in this rapidly changing environment.

ShareAction's investor guide *Banking on a Low Carbon Future* provides practical guidance on what investor expectations should be for banks to mitigate climate risk, seek green financing opportunities, and leverage public-private partnerships and industry collaborations to accelerate action on climate change. It provides detailed investor engagement questions on climate risk assessment and management, defining low carbon products and services, leveraging collaboration, and implementation and monitoring. This is very complementary to our own call to action for the banking sector to "establish practices that reduce their vulnerability to climate change and accelerate the transition to a low carbon economy".

The world is heading towards a tipping-point, where the effects of environmental degradation, climate change, and continued oppression of vulnerable populations linked to climate change inaction could become irreversible. Addressing these challenges will require urgent action, a mobilisation of vast sums of private capital, and a significant break from 'business as usual'. Investors wield enormous transformative power through their investor climate risk engagements, pension schemes, and as global banking sector clients, to support the redirection of capital flows needed to achieve a below 2 degrees Celsius future. Please join us in using the tools and questions provided by ShareAction and others to expand investor dialogue and action with the financial sector on climate risk.

Lauren Compere, February 2017

Executive summary

In a landmark climate deal struck at UN negotiations in Paris in 2015, international governments agreed to limit temperature rises to ‘well below’ 2°C, with an ambition for 1.5°C (hereinafter <2°C) and to make finance flows consistent with low carbon and climate-resilient development.¹ Banks have a critical role to play in the realisation of this agenda. To stay below the 2°C threshold, provision of finance must be aligned with the urgent need to decarbonise the global economy by mid-century, and directed away from activities that could undermine a successful low carbon transition.² Forward-looking banks can play a positive role in providing the major injections of capital required to finance technologies, infrastructure and the transition of traditional industries, as well as to cover the costs of adaptation. The International Energy Agency (IEA) estimates that the world needs to spend US\$359 trillion by 2050 to avoid catastrophic climate change.³

This report provides guidelines to inform investor engagement with banks, in line with the Paris Agreement. Investors are often the clients, shareholders and bondholders of banks and therefore have several levers to promote change in the sector. The report begins by making the case that for long-term investors seeking to reduce exposure to climate risks, banks stand out as a strategic choice for focused engagement efforts. The guidelines then turn to consider four key areas (see Box 1), outlining how banks can be encouraged to adjust their practices in light of the risks and opportunities associated with the transition to a <2°C economy.

The guidelines seek to be complementary to and expand upon the recommendations outlined by the Financial Stability Board Task Force on Climate-Related Financial Disclosures (FSB TCFD), and draw upon a range of sources that consider how financial actors must respond to the low carbon transition. We do not advocate a ‘one-size-fits-all’ approach to engagement: a case-by-case assessment will be required to fully address the specific issues associated with the activities of each bank. While beyond the scope of this report, we recommend a holistic approach that considers other social and environmental issues, such as human rights and biodiversity.

We hope that this report inspires meaningful dialogue between investors and banks, helping drive the much needed change required to help fulfil the ambitions of the Paris Agreement.

Box 1: Guidelines on four key areas

1. Climate risk assessments and management: This section provides guidance for investor engagement to promote the identification and disclosure of climate risks faced by banks at a variety of levels. It outlines how banks can adapt policies and day-to-day decision-making to manage climate risks.
2. Low carbon products and services: This section examines how investors can encourage banks to develop a company-wide and systematic approach to identifying, developing, incorporating and disclosing information about products and services that will enable the transition to a low carbon economy.
3. Policy engagement and collaboration with other actors: A successful transition to a low carbon economy will require various actions that fall beyond the remit of the banking sector. This section describes how banks and their investors can help bring about these wider changes through policy engagements and collaboration with other actors.
4. Implementation and monitoring: To support the company-wide integration of climate risks and opportunities, investors can encourage banks to develop and publish climate change strategies and complementary policies. This section explores how climate-related policies can be integrated into governance structures, and suggests accountability mechanisms to enable analysis and evaluation of their implementation.

The investor case for engaging with banks

The economic case for limiting global temperature rises to below 2°C is well established and has been widely welcomed by investors.⁴ Ahead of the Paris Agreement, over 400 investors with US\$24 trillion of assets under management (AUM) supported the Global Investor Statement on Climate Change.⁵ The focus of much climate-related investor engagement to date has been with high carbon industries. While these sectors face the most immediate risk from a low carbon transition, there is a strong and complementary case for engaging with the banking sector. Institutional investors can ensure that, at a minimum, banks are not hindering the path to a green and prosperous future, and are instead shifting capital flows to the areas required for an orderly low carbon transition.

This section sets out the investor case for engaging with banks on climate change. It considers the sector's systemic importance to the global economy, and how its alignment with <2°C pathways could significantly help investors reduce exposure to climate risks at a portfolio-wide level. It then outlines different climate risks that banks and their investors can be exposed to and help mitigate, before describing opportunities arising from the low carbon transition. It ends with suggestions on how investors can help accelerate climate action in the banking sector.

The banking sector in the global economy

From underwriting securities and providing loans, to enabling financial transactions and offering advisory services, banks play a wide range of roles that are central for the effective running of the global economy. Their main function consists in connecting economic actors that need financial resources to those that own or manage the world's capital, as well as providing capital themselves. They facilitate business and entrepreneurship, and through this foster innovation and development across all sectors. At present, within most of the world's largest banks, these functions are enabling high carbon activities that accelerate global warming.⁶ Reimagined, they could help facilitate the transition to a more sustainable economy.

Generally, the activities of banks can be divided into five areas: investment banking, corporate banking, retail banking, commercial banking and private banking (see table on page 7). Some banks also

run asset management branches and insurance businesses. Different companies cater to a diverse range of clients, regions and sectors. These variations are reflected in the ways individual banks are structured. For example, some operate globally and focus on investment and corporate banking, with big multinationals as clients, while others are limited to certain countries or regions and focus on retail and commercial banking.

“ Investors supportive of the goals of the Paris Agreement have much to gain from strategic engagement with the banking sector.”

Through this wide range of activities, banks are almost uniquely placed to influence the behaviour of actors across the whole economy. A shift on this scale is required to protect financial actors from the systemic risks associated with dangerous temperature rises – which can only be hedged against through a timely and economy-wide decarbonisation. While investors can reduce their exposure to asset-specific climate risks by tilting their portfolio away from industries unlikely to be successful in adapting for low carbon resilience,⁷ at a portfolio-wide level, they will remain exposed to the damage associated with high carbon climate scenarios.

Engagement with the banking sector could play an important role in risk reduction and creating a climate-resilient economy, not least considering that most companies, in terms of external sources of funding, are largely financed by bank loans rather than capital markets.⁸ Banks that align their products and services for consistency with <2°C pathways will assist economy-wide decarbonisation. On the other hand, by financing activities that facilitate high carbon processes, banks indirectly contribute to global temperature rises. As such, investors supportive of the goals of the Paris Agreement have much to gain from strategic engagement with the sector.

Area of banking	Role of the bank	Examples of products and/or services provided
Investment banking	Provision of various services to individuals, companies and governments; acting as the intermediary between entities that have money (generally institutional investors) and those that need it (generally companies)	Capital raising through initial public offerings (IPOs) or bond issuances, leveraged finance, financial advisory, trading platforms, research, etc.
Corporate banking	Provision of financing to companies through debt issuances, structured products, or other banking and investment products	Secured term loans, syndicated loans with multiple arrangers, structured finance-type loans, project finance, etc.
Retail banking	Provision of products and services to individual clients, rather than companies or other banks	Savings and transactional accounts, mortgages, personal loans, debit and credit cards, etc.
Commercial banking	Provision of the same products and services as in retail banking, but to companies	Savings and transactional accounts, small loans, debit and credit cards, etc.
Private banking	Also referred to as Private Wealth Management; retail banking and wealth management for high-net-worth individuals	Savings and transactional accounts, credit and debit cards, tailored lending, investment services, family governance, philanthropy services, etc.

Climate risks and the banking sector

Whether temperature rises are successfully limited to below 2°C or not, banks and their investors will face a number of climate risks. These are often classified in the three categories detailed below: physical, transitional and liability risks. Damage will be much more salient under high emission scenarios where insufficient progress has been made on adaptation measures to deal with the physical impacts of climate change.

Compared to other industries, exposure to the banking sector does not present the greatest direct asset-level climate risk to investors – although banks on the wrong side of the transition could be left managing challenges in a non-strategic manner, bearing the cost of clients ill-prepared for climate resilience and affected by the impacts of stranded assets. The real advantages investors can gain from engaging with banks can be seen at a portfolio-wide level, when considering the sector's potential to help facilitate an economy-wide decarbonisation.

Physical risk

The direct impacts of climate change and resulting environmental changes are called physical risk, and are already having an observable effect in many parts of the world today.⁹ Implications include ecosystem disruption, extreme weather events, rising sea levels, resource scarcity and poor crop yields – compounding existing issues of conflict, poverty and migration.¹⁰ It is in the interests of both banks and their investors to prevent such high carbon outcomes.

High carbon scenarios will result in systemic damage to the global economy, with recent economic modelling estimating that in a plausible worst case climate scenario (4°C of warming this century), the value at risk may be equivalent to a permanent reduction of between 5% and 20% in portfolio value in just over a decade.¹¹ Another recent study found that continuing to emit greenhouse gas (GHG) emissions on a 'business as usual' trajectory could entail a value at risk of up to 16.9% of the world's manageable assets, or US\$24.2 trillion, by 2050.¹² Particularly vulnerable sectors include agriculture, forestry and tourism. In the long-term, physical risks will likely impact all sectors due to the globalised nature of supply

chains, and the potential for geopolitical instability. This means that the range of assets potentially affected by physical risks is very broad.

Transitional risk

While there will be costs associated with the low carbon transition, these are, on aggregate, far less harmful than the implications of unmitigated climate change. The impact that companies could face linked to attempts to curtail GHG emissions is called transitional risk. These changes can happen rapidly, triggered by legislative and regulatory action on climate change and by technology and market-based developments in low carbon sectors – such as renewable energy.¹³

For instance, the Bundesrat (the federal council of German states) has recently voted in favour of a resolution to ban petrol and diesel cars on German roads by 2030.¹⁴ This would have effects not only on automakers, but also on component suppliers, refineries and garage owners. It is also estimated that, due to Germany's Energiewende – which aims to completely transform the country's energy sector – the market share in power generation of the Big Four utility companies (E.ON, RWE, EnBW and Vattenfall) has fallen by about 10% to around 50% in only three years.¹⁵

High carbon industries will face challenges in transitioning for low carbon resilience, and might be unsuccessful in this process. Transitional risk is most likely to affect the fossil fuel sector, utility and automotive companies and industrials. Companies that have not adapted their business models could be impacted by demand destruction, stranded assets and even bankruptcy. A bank heavily exposed to these sectors therefore risks an increase in impaired assets. Banks can mitigate this by proactively managing the risks posed by high carbon companies, and engaging with clients on their transition plans. More detail on this is provided in the next section.

Liability risk

Liability risk could arise for banks from parties who have suffered climate-related damages, and seek to recover losses from those they believe to have been in some way responsible. This could include clients who were not adequately advised on climate-related issues and suffered losses as a result. For example, M&A clients receiving advice on mergers

with or acquisitions of high carbon companies might feel they were not suitably informed about potential transitional risks. Banks could also lose revenue and potentially face loan impairments if large clients face legal action.

Applying climate to the risk types traditionally considered in banking

Physical, transitional and liability risks feed into the various risk categories already being assessed and managed by major banks today. The table on page 9 outlines how climate change could intensify each of these.

Recent investor engagement with global banks has shown that the sector has limited understanding of the implications of climate risk, and is yet to fully integrate climate factors into strategic planning.¹⁶ This lack of preparation should raise a red flag to investors in listed banks.

Opportunities in financing the low carbon transition

While it is critically important to ensure banks are not exacerbating climate risks through their activities, there will also be upside opportunities for banks that position themselves on the right side of the low carbon transition. The IEA estimates that in total the world needs to spend US\$359 trillion by 2050 to avoid catastrophic climate change,³⁵ and public finance will not be able to satisfy this gargantuan need for funding. Efforts to fill this funding gap will also contribute to the targets set by the UN Sustainable Development Goals (SDGs), particularly on the seventh goal on affordable and clean energy and goal number 13 on climate action.

Across all of the banks' business functions, investors can encourage the development, integration and promotion of products and services to meet these low carbon requirements. This includes the provision of loans and other services; such as selling securities to institutional investors, underwriting corporate issuances, advisory services and research. As well as increasing the bank's revenue streams, investors can benefit from increased access to green products and services.

Type of risk	Possible effect of climate change
Credit risk	<p>Under low carbon scenarios, loans to high carbon companies risk becoming impaired where clients have failed to transition to a low carbon business model and are left with stranded assets and other financial losses.</p> <p>Under high carbon scenarios, financial commitments made to clients in vulnerable sectors are likely to be the first to become impaired. Taking a longer-term view, high carbon scenarios are likely to increase credit risk across all sectors and regions. Moody's Heat Map has shown that credit impact from environmental issues varies widely across sectors globally, both in terms of materiality and timing.¹⁷</p>
Market risk	<p>Climate change could contribute to a wide range of market risks – affecting commodities, currency valuations and creating equity risk. Physical and transitional risks are likely to impact commodity prices (such as oil and agricultural commodities), and extreme weather events can reduce the value of currencies in countries where there is wide-spread economic disruption.</p> <p>The output of crop production will be affected by climate change in the short- to medium-term, thus providing a particularly salient example.¹⁸ Increased food prices affect general inflation, with food being a large component of the consumer price index.¹⁹ Recent recurrent droughts have affected agricultural output in Australia, leading to an increase in prices globally.²⁰</p>
Liquidity risk	<p>As seen in the housing market in 2008, liquid markets can become illiquid very quickly.²¹ Transitional risks could cause assets linked to high carbon sectors to become illiquid if there are capitulations, panic selling and bankruptcies. Under high carbon scenarios, companies severely affected by the physical impacts of climate change might find themselves in financial difficulty, and assets linked to those companies risk becoming illiquid.</p>
Reputational risk	<p>For banks wishing to attract and retain customers and staff, there could be competitive advantages for those with strong climate credentials, and negative implications for banks that come under pressure for supporting unsustainable activities. Climate campaigners are increasingly targeting banks and creating public awareness of their role in financing high carbon projects and companies.²² This could be increasingly important, as recent studies have shown that millennials demonstrate less brand loyalty and value environmental and social causes higher than previous generations.²³</p>
Operational risk	<p>Changing climate conditions present additional risks to banks' buildings, processes, staff and systems. The International Finance Corporation notes that <i>"business activities may be disrupted, and contingency plans may prove inadequate. Unless an institution's risk management methodologies and tools integrate considerations for climate change, its risk position may be underestimated"</i>.²⁴</p>
Systemic risks to the economy	<p>The effects of climate change on the global economy are likely to be systemic.²⁵ Given the transnational nature of supply chains, flows of capital and communication structures, the economic consequences of extreme climate events will not be limited to the most vulnerable and exposed regions. They could, for instance, lead to food price shocks, mass migration and resource conflicts.²⁶ This type of systemic risk affects all asset classes and cannot be hedged through diversification.²⁷</p>

Box 2: The case for considering climate in short-term activities

In their engagements with banks, investors might find that a key pushback is that many assets only remain on the balance sheet for a short time period, and climate change therefore does not need to be considered. The duration of loans, for instance, is often less than five years, and many other products and services offered by banks – such as underwriting securities – move off the balance sheet even more quickly. However, investors can challenge this. There is a strong case for incorporating climate risk assessments into short-term activities:

- **Short-term loans to high carbon projects or companies that do not have <2°C transition plans in place will contribute to increased temperature rises and the risk of carbon lock-in.** Carbon lock-in describes the inertia created by fossil fuel-based energy systems that hinders efforts to introduce alternative energy technologies. For example, once upfront investments have been made in hydrocarbon projects and related infrastructure, there is a considerable incentive to continue operating them for their full economic duration, which can be over 40 years.²⁸ This will intensify the effects of climate change on the economy as a whole, with associated losses for banks and their investors.
- **In many regions, the physical impacts of climate change are already being felt and are compounding other problems, such as resource scarcity, migration, conflict and poverty.** According to the Vulnerable 20 (V20) group of developing countries, losses linked to the effects of climate change were estimated at US\$45 billion a year since 2010, with annual losses of at least 2.5% of GDP²⁹ – a number expected to increase to US\$400 billion for the V20 by 2030.³⁰ This will have economic implications outside of the regions directly affected, given the globalised nature of trade, communications and supply chains.
- **Policy and technology changes are taking place much faster than many had previously predicted, accelerating the disruptive trends that challenge high carbon business models.** For instance, in China³¹ and India,³² momentum behind environmental policies continues to grow, reflected in both countries' Nationally Determined Contributions (NDCs). Alongside an increasingly ambitious international tapestry of policies, technological advances in low carbon products and services (such as renewables) are also taking place more rapidly than many high carbon industries currently forecast.³³ Royal Dutch Shell, for instance, describes the <2°C pathway as a 'Goldilocks' scenario, requiring a "combination of all the most optimistic outcomes".³⁴ This might suggest that the company is not seriously considering the implications of a rapid decarbonisation on its business model, and may not be making adequate headway on adapting for this outcome.
- While many of the products and services offered by banks move off their own balance sheets quickly, they will remain on their clients' for a much longer time period. If banks want their clients to be successful in the future, and continue using the bank's services, they need to consider the climate risks passed on to them.

The need for greater progress and the role of investors

In recent years, progress has been made by the banking sector to factor in climate concerns. A number of major banks have increased financial flows towards low carbon, climate-resilient activities. For instance, Bank of America Merrill Lynch (BAML), the second largest bank in the US, committed in 2007 to dedicate US\$20 billion globally over 10 years to finance new climate mitigation and adaptation technologies and energy efficiency.³⁶ The

bank met this goal in 2012 and has since committed to increasing its initiative to US\$125 billion by 2025.

Progress on low carbon financing must be weighed up against a bank's continued commitments to high-carbon projects and sectors, as this can undermine the total emission saving benefit. For example, one source estimated that BAML's financing of coal-related activities was approximately US\$18.5 billion between 2005 and 2014.³⁷ In 2015, however, BAML made positive headway to address this, and committed to reduce financing for coal mining

companies worldwide, and to end financing for mountaintop removal coal producers.

Other banks have taken steps to influence client practices and embed climate change concerns into how markets function.³⁸ Banco Bilbao Vizcaya Argentaria (BBVA), the second largest bank in Spain, developed an eco-rating tool to evaluate the environmental risk of companies.³⁹ It assigns a credit risk rating according to factors such as emissions, consumption of resources, potential to affect the environment, and applicable legislation.

go further in adjusting practices for a sustainable future. Through one-to-one meetings, proxy voting, collaborative engagement initiatives and filing and supporting shareholder resolutions, shareholders can urge for greater progress. As the clients of banks, investors can stimulate and signal demand for low carbon products and services, and use the climate credentials of banks when considering which firm to do business with. The Investor Toolkit at the end of this report provides further suggestions on specific actions investors are encouraged to take.

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There remains much room for improvement across major banks in their contributions to the low carbon transition.

Despite these advances, recent studies have shown that there remains much room for improvement across major banks in their contributions to the low carbon transition.⁴⁰ The progress seen to date falls short of the scale and urgency required to meet the goals of the Paris Agreement. So long as major banks continue to financially underpin high carbon activities (such as coal-based power plants), the sector's potential to play a positive role in the low carbon transition will remain stunted.

In light of the need for greater progress, this report provides guidance for investors seeking to promote credible climate strategies across the banking sector. Our recommendations focus on four key areas: climate risk assessments and management; low carbon products and services; collaboration with policymakers and other actors; and implementation and monitoring. They are complementary to existing frameworks, such as the FSB TCFD; discussing in more detail some of the key issues, highlighting focus areas, and suggesting specific questions to raise.

As shareholders, investors can use their rights to influence behaviour and encourage boards to

1. Climate risk assessments and management

This section explores how investors can engage with banks on the need to measure and disclose their exposure to different types of climate risk, and adjust policies and practices to proactively manage these. While climate-related policies are important in enabling the effective management of risks, it can take a long time to develop and implement them at a company-wide level. We therefore encourage this to be balanced with a bottom-up approach – with investors also paying attention to decisions that need to be dealt with on a more immediate timeline, as highlighted recently with the Dakota Access Pipeline.⁴¹ In this case, banks have come under scrutiny for financing activities that will contribute to temperature rises and violate indigenous rights.

Climate risk identification will require new forms of data collection and assessment, and its mitigation will require a refreshed approach to dealing with high carbon clients and those particularly vulnerable to the physical impacts of climate change. Investors should ensure that banks provide full transparency on the implementation of policies, allowing shareholders and others to evaluate how they are being enforced.

“ Climate risk identification will require new forms of data collection and assessment, and its mitigation will require a refreshed approach to dealing with high carbon clients.

Measuring and reporting risk

Approaches to assessing climate risks

There are two interlinked ways in which investors can consider climate risks in relation to the banking sector. On the one hand, banks themselves will be exposed to climate risks, including physical, transitional and liability risks. On the other hand, banks financially support the activities that cause climate risks: for instance, by providing capital to enable high carbon activities. All financial actors – including investors and banks – will be exposed to the systemic economic damage associated with high carbon scenarios. If banks take measures to mitigate climate change, they will lower their own risk exposure, and that of the economy as a whole.

Climate risks have a range of dimensions, and the exposure of an individual bank will depend on its structure, client base and geographic outreach. When investors assess a bank's resilience to different climate scenarios, this should be informed by how its assets are likely to be affected by the impacts of transitional, physical and liability risks; as well as potential economy-wide implications that could result in a general down-turn in business. Whilst these assessments remain more of an art than a science, a lack of full information does not preclude action being taken where risks are clear.

Approaches to identifying and measuring risk are constantly evolving. The FSB TCFD recently provided the first global, industry-led set of recommendations to assess and report on climate risks.⁴² Investors should encourage banks to report against these recommendations and, if applicable, also encourage their asset management and/or insurance arms to do the same. Investors can also request that banks require their clients to report against the TCFD framework. This information will be helpful for banks and investors in assessing risk in a comparable and consistent way.

Other helpful frameworks have been developed by Mercer⁴³ (see Box 3), the 2°C Investing Initiative,⁴⁴ Carbon Delta,⁴⁵ the Sustainability Accounting Standards Board,⁴⁶ the Global Reporting Initiative (GRI),⁴⁷ and others,^{48,49} and also include carbon footprinting. This report is not prescriptive about which framework is preferable and sees value in combining different approaches in order to achieve a rounded and comprehensive assessment. As

Box 3: Mercer framework – TRIP

A well-regarded framework has been developed by Mercer, one of the largest investment consulting firms. Mercer identifies four key risk factors relevant to climate change: Technology, Resource Availability, Impact and Policy (or, for short, TRIP). This framework covers progress in the development of technology to support the low carbon economy; the impact on investments of chronic weather patterns and related physical changes; the impact of acute weather incidence and severity; and international, national and sub-national initiatives to reduce climate risks. These elements provide a framework that can be used by investors and banks to identify climate risk factors.

tools and risk assessment frameworks continue to develop, we encourage investors to ensure that banks are utilising best-practice evaluation mechanisms. A standardised approach to risk assessment would allow investors to make like-for-like comparisons across the sector, and is an aspiration to work towards.

Different tools can be utilised when carrying out risk assessments, including scenario analysis, Value at Risk (VaR), and an Options Valuation Model. More information on these types of assessment can be found in Appendix 1.

Levels of risk assessments

Asset-specific level

When engaging with banks on climate risk assessments, investors can recommend that these are first carried out on an asset-specific level (including off-balance-sheet items). This requires a granular assessment of the client related to the asset and their resilience to different climate scenarios, from low carbon (including <2°C) through to high carbon (6°C+) pathways. Priority areas for these assessments should include:

- Assets linked to sectors and projects with high carbon business models: Under low carbon scenarios, assets related to high carbon industries – including fossil fuels, extractives, utilities and automakers – that have not successfully transitioned for low carbon resilience will pose the greatest risk to banks. Scenario analysis can be used to assess the impact of low carbon outcomes on these assets.

- Assets linked to sectors, regions and clients particularly vulnerable to physical impacts: Under scenarios of continued warming, sectors including agriculture, forestry, infrastructure, tourism, and clients located in geographically sensitive regions will be among the first to face economic disruption if they cannot adapt for resilience.

Banks should be encouraged to report on their exposure to these sectors. For a full analysis of asset-specific risks, investors might encourage banks to look at a company's sources of revenue, capital expenditure and supply chains. Investors can suggest banks collect information about an asset through client engagement and reporting, verifying their compliance with applicable environmental legislation, reviewing sustainability ratings and news reports, and liaising with relevant authorities and NGOs.

Company-wide level

Once asset-specific assessments have been carried out, the next step investors can encourage banks to take is to use this information to perform company-wide analysis for various climate scenarios, including <2°C through to high carbon pathways. For instance, banks can add up the VaR of each asset under different climate scenarios evaluated, and calculate the total impact on portfolios, the balance sheet, and the company as a whole. This information will be useful for investors analysing the risk exposure of different investee banks at a company-wide level.

Questions for investor engagement

What is the bank's exposure to high carbon sectors? How resilient are assets related to these sectors under low carbon scenarios, including <2°C pathways?

What is the bank's exposure to sectors, regions and clients particularly vulnerable to physical risks? What value would be at risk under high emission scenarios, considering the potential impact of weather events, rising sea levels, crop failure, etc.?

How is the bank collecting data about specific assets, and how can this information be verified?

What is the total VaR for the bank under different climate scenarios, including <2°C through to high carbon pathways?

Assessment of physical risk is best conducted at a regional level. Ecosystem degradation, extreme weather events and rising sea levels should be monitored to assess the potential implications and resilience of the economies where banks operate and have exposure to through supply chains. It is important to assess the social implications of these changes; how they may undermine the business of the bank and the risks they might pose to its clients.

Questions for investor engagement

What are the NDCs of the different countries the bank operates within? Are the bank's activities consistent with achieving these goals?

What monitoring processes does the bank have in place for the different countries it operates in to track policy and technological changes? How is the bank using this information to inform strategy and practices?

What monitoring processes does the bank have to assess physical change and the associated social implications of climate-related events in different countries? How is the bank using this information to inform policies and practices?

Country level

Investors can encourage banks to assess climate risks on a country level. Banks often operate in a number of jurisdictions where different emissions-related regulations apply. This includes the Nationally Determined Contributions (NDCs) established under the Paris Agreement. The Agreement contains a ratchetting mechanism to achieve its <2°C goal, requiring nations to convene a 'facilitative dialogue' to increase the ambition of the pledges every five years.⁵⁰ NDCs differ from country to country. For instance, while India aims to reduce emissions by 33% to 35% by 2030 below 2005 levels, Japan seeks a reduction of 26% below 2013 emissions by 2030.⁵¹ Banks should be prompted to, at a minimum, not hinder their achievement, and ideally contribute to their realisation.

Investors should ensure that banks are monitoring for policy and technology advances in nations where they operate that could stimulate transitional risks. These may not always be directly linked to climate change – for example, water pollution and urban smog are key policy drivers in India and China⁵² – but still affect demand for high carbon products, for example by banning diesel cars in cities.

Reporting on climate risks

Investors can ask for the analysis of these risks to be publicly reported, with top line data in Annual Reports and mainstream financial filings, and additional information in sustainability reports and other disclosure frameworks, such as the Carbon Disclosure Project (CDP). Banks should report to investors and other stakeholders the types of climate risk assessments carried out, what the outcomes were, and how these will affect policies and day-to-day decision-making. In particular, banks should report annually on their exposure to high carbon sectors, as well as on their assistance in the securitisation of high carbon assets.

It is important that the information provided to stakeholders can bare scrutiny, preventing misleading statements that obscure the true nature of a bank's exposure to climate risks. Accountability

can be improved through increased transparency: for instance, by publishing which companies they provide services to and what services they provide.

Questions for investor engagement

How does the bank currently report on its exposure to climate risks?

Does the bank disclose information about its exposure to high carbon sectors and its assistance in the securitisation of high carbon assets?

How can the bank verify the results of its risk assessments? What accountability mechanisms have been put in place to allow for external scrutiny?

leave banks and their investors exposed to high-risk projects and reputational threats, as well as raising a corporate governance red flag.

Exclusion policies

The activities of some companies and industries stand misaligned with the <2°C target of the Paris Agreement, as their continuation contributes to increased temperature rises, intensifying the effects of climate change on the economy as a whole. Such activities will counteract any adaptation measures the bank is also supporting, and reduce the emission savings that might be achieved through the promotion of low carbon products and services. In addition, there are often other risks associated with supporting high carbon activities, not least reputational threats, since they tend to come under closer scrutiny from campaigning groups and the media. Investors should discourage banks from providing products and services that enable the types of activities documented below.

Coal

The burning of fossil fuels is the chief cause of anthropogenic climate change.⁵⁴ The embedded carbon emissions from oil, gas, and coal in the world's currently operating fields and mines takes us beyond 2°C of warming.⁵⁵ To stay within the <2°C carbon budget, some fields and mines will need to be closed before they have been fully exploited.⁵⁶ China, for instance, has recently stopped the construction of 85 planned coal power plants.⁵⁷

Investors should engage with banks on the need to end the provision of financial services – including project finance, asset-specific financing and re-financing – to new coal mines and coal-based power plants, and new and existing clients that are highly dependent on coal mining or power plants. This does not imply that industries must be shut down overnight, but points to the need for banks to commit to phase out their exposure over an appropriate period, allowing time for readjustment.

To determine whether a company is dependent on coal, the Dutch NGO BankTrack recommends using the following three criteria:

1. The company is planning to develop new coal mines / power plants
2. More than 30% of the company's revenues are derived from coal

Mitigation of climate risks

Risk assessments that are not supported by policies for mitigation will fail to protect banks, clients and investors.

To best address the potential transitional risks associated with high carbon industries, and to help mitigate the longer-term physical risks associated with business-as-usual emission trajectories, investors can encourage banks to align the provision of financial services for consistency with <2°C pathways. In some cases, this will require the introduction of exclusion policies, and in others it will necessitate client engagement strategies that require companies to transition for low carbon resilience. Outlined below are a number of examples of how banks can manage and mitigate their exposure to climate risks.

An important theme that runs throughout this section is the need for transparency and accountability around the implementation of policies. Without sufficient disclosure, it is hard for investors to assess if a bank's policies are being reflected in practice. Concerns about this gap between words and actions have been raised by a number of organisations. For example, in 2015, NGOs accused Crédit Agricole of behaving inconsistently with its own policy on coal by supporting a proposed major new coal plant project in Croatia.⁵³ Such inconsistencies can

3. The coal company burns or mines and therefore leads to the burning of more than 20 million tons of CO₂ annually

Banks may respond that coal is essential for the economic growth of emerging economies, and that it is impractical to stop financing coal when industries are currently dependent on it. Investors can highlight that recent studies by international development and poverty organisations highlight that on aggregate, the negative impacts related to building more coal-fired power plants in developing countries exceed their positive effects, while renewable energy would be better for energy security, health and jobs.⁵⁸

Progressive policies on coal are being adopted by a growing number of European banks, and UK-based banks should be encouraged by investors to catch up with their peers. Policies on ending support for new coal mines and power plants have been put in place by, among others, Deutsche Bank⁵⁹ and Commerzbank⁶⁰ (the two largest German banks), by Natixis⁶¹ (see Box 4) Société Générale,⁶² Crédit Agricole,⁶³ and BNP Paribas⁶⁴ (some of the largest French banks), as well as by the Dutch bank ING⁶⁵ and the Belgian Bank KBC.⁶⁶ Policies on coal in the largest UK banks, if they exist, so far only apply to potential new clients, but not to existing ones.

Oil and gas

Investors should engage with banks on the provision of financial services that support the exploration and production of oil and gas reserves unneeded under <2°C pathways. In addition to over 80% of global coal reserves, a 2015 study found that nearly 50% of known gas reserves and a third of known oil reserves cannot be burnt if temperature rises of

more than 2°C are to be prevented.

Some of the highest risk assets are linked to large scale hydrocarbon projects with long lifespans (10+ years), and associated infrastructure. These pose a double-edged risk to banks and their investors since they are at risk of becoming economically stranded under low carbon scenarios, and will contribute to emission increases and associated temperature rises in the case they are fully exploited.

Investors could suggest that banks use cost curves to assess where financial services to oil and gas related activities should be restricted. For example, Carbon Tracker uses break-even prices to warn against the development of higher-cost projects unneeded under low carbon scenarios. This analysis showed that US\$283 billion of possible liquefied natural gas (LNG) projects would be surplus to requirements under the IEA 450 scenario (consistent with a 50% chance of limiting temperature rises to 2°C),⁶⁷ as well as numerous Arctic, deep water, tar sands and oil shale investments. Investors can discourage banks from supporting activities related to assets at risk of becoming stranded. Another means of assessment has been developed by the World Resources Institute, which calculates the potential GHG emissions from fossil fuel reserves.⁶⁹ Projects exceeding a maximum threshold could be refused finance.

Other contributors to greenhouse gas emissions

Investors should encourage banks to adopt strict policies for companies associated with other major causes of emissions, such as deforestation (i.e. for soft commodities like palm oil, pulp and paper) and intensive agriculture.⁷⁰ These must exclude the

Box 4: Example of good practice – Natixis

In order to bring its commitment in favour of climate change mitigation and environmental preservation a step further, Natixis has made the following commitments, worldwide. It commits to:

- no longer finance coal-fired power plants or thermal coal mines
- no longer accept new advisory or arrangement mandates linked to financing of this type
- no longer provide general purpose corporate financing to companies whose business is over 50%-reliant on operating coal-fired power plants and/or thermal coal mines.

This policy applies to bank financing, advisory services, capital markets, third-party asset management and Natixis's insurance business.

provision of financial services that facilitate some of the most destructive activities, such as large-scale deforestation. Investors should be aware that many certification schemes for soft commodities have been shown to fall short of fully addressing environmental and social concerns.⁷¹ Policies must therefore be supplemented by increased transparency across the groups' operations to allow better evaluation of the bank's activities.

Whilst exclusion policies are still in development, investors can monitor for any activities that banks are planning to support and discourage high-risk, high-emission deals from going ahead. Such projects are often highlighted by NGOs such as BankTrack, Greenpeace, Rainforest Action Network and urgewald.

Questions for investor engagement

What is the bank's policy regarding coal? How is this implemented, and by when does the bank plan to update it to reflect best practice?

What is the bank's policy regarding the provision of financial services that support the exploration and production of oil and gas reserves? Is it aligned with <2°C pathways? How is the policy implemented?

Is the bank presently planning to support any other high-emission activities that have been highlighted as high-risk and inconsistent with low carbon scenarios?

Sector policies and client engagement on <2°C alignment

Investors should monitor banks' policies related to high carbon sectors that are exposed to high or medium climate risks, assessing the minimum criteria that companies need to fulfil in order to access financial services. This includes industries such as oil and gas, extractives, utilities and transport.

Banks should be prompted to update policies to require that high carbon industries develop and integrate <2°C aligned transition plans in order to

“ Banks should be prompted to update sector policies to require that high carbon industries develop and integrate <2°C aligned transition plans, and engage with clients in these sectors to monitor progress.

access finance, and engage with clients in these sectors to monitor progress towards implementation. Both new and existing clients should be required to make adjustments for low carbon resilience. These requirements could be included in loan covenants.

Transition pathways are likely to differ from company to company, as well as sector to sector. Key items for assessment might include how companies are allocating capital (i.e. towards low carbon innovation, or further supporting high carbon activities), strategy and governance. The FSB TCFD has drafted sector-specific recommendations which could help inform a bank's assessment of how clients are managing climate risks.⁷²

Banks' policies should contain a timeline for engagement, with clear objectives and milestones that allow progress to be monitored. If clients make no progress towards these objectives over an appropriate time period, there should be repercussions, including refusing to refinance or renew services. Banks should be able to demonstrate to investors how these policies are being implemented and enforced. This could be achieved through greater transparency around the financial services provided by banks to the sectors described in this section.

The British bank Standard Chartered has taken steps towards engaging with energy companies around <2°C alignment (see Box 5). Investors can

welcome this policy and request further information regarding its implementation, such as the objectives and timelines for engagement, as well as the consequences for clients unable to comply. Over time, investors can encourage the bank to roll this policy out across other high carbon sectors, and across its other banking divisions.

Questions for investor engagement

What policies does the bank have in place regarding high carbon sectors, including oil and gas, utilities, extractives, automakers and industrials? Do these include provisions for <2°C alignment?

What are the objectives and timelines for client engagement, and what are the consequences for companies that fall short?

What disclosures does the bank provide to allow investors and other stakeholders to assess the implementation of these policies?

Recalibrating loan pricing to reflect climate risks in the cost of capital

Borrowers that present a higher risk to lenders should in theory be charged a higher cost of capital. The Industrial and Commercial Bank of China (ICBC) has shown that incorporating environmental risks into credit rating systems for firms affects the cost of capital for banks' clients, helping promote greener economic development.⁷⁴

Investors can ask banks whether they have considered recalibrating loan pricing to reflect climate risks in the cost of capital, which could be done following the assessment of climate-related risks for individual companies. The advantages of this are that it reduces climate risks in the bank's credit portfolio and allows the bank to adjust prices based on its own organisational goals, for instance in terms of loan portfolio composition (see Box 6). Additionally, it incentivises clients to adjust their strategies to gain access to capital at a lower cost.

Box 5: Example of good practice – Standard Chartered

Standard Chartered's Position Statement on Climate Change and Energy covers its clients in the energy industry in Corporate and Institutional Banking and Commercial Banking.⁷³ It commits to introducing new assessment criteria relating to climate risks for energy industry clients, in order to promote alignment with a 1.5°C climate scenario. Across all energy sectors, the bank expects companies to quantify annual emissions in accordance with an internationally recognised methodology and implement measures to improve energy consumption and resource efficiency, and reduce the release of greenhouse gases.

Box 6: Example of good practice – First Green Bank

First Green Bank is headquartered in Florida and is a customer-driven bank that aims to provide localised decision-making and set a positive environmental and social example to its community.⁷⁵ The bank has introduced policies to promote green building projects and solar programmes, such as:

- Discounted interest rates for commercial and residential projects that meet green building criteria of LEED certification by the US Green Building Council
- Solar Loan program which offers a great, long-term fixed rate to encourage customers and employees to install solar panel systems for energy use

Communication about climate risks in IPO and bond prospectuses

Investors can monitor whether banks are informing clients of the climate risks associated with the securities they invest in, allowing clients of banks to carry out better long-term risk management. The same principle applies to securitised loans that are sold on to investors.

Managing climate risks in banking sector pension schemes

Investors may wish to engage with banks about the incorporation of climate risk considerations into the pension schemes of banks' own employees. It is important to note that pension funds are separate

entities from the bank and have their own board of trustees.

Good progress has, for example, been made by HSBC's defined contribution pension scheme (see Box 7). This scheme introduced a climate change policy, which states that in the context of their fiduciary responsibility, trustees of the pension scheme are supportive of the Paris Agreement to limit temperature rises to <2°C. Legal & General Investment Management (LGIM) manages the scheme's equity default option in its Future World Fund, which incorporates a 'climate tilt' to reduce exposure to companies with worse-than-average carbon emissions and fossil fuel assets, and increases exposure to companies that generate revenue from low carbon opportunities.⁷⁶

Box 7: Example of good practice – HSBC pension scheme

This policy was adopted in November 2016 and applies to defined contribution pensions held by HSBC employees.⁷⁷ It requires appointed investment managers of the pension scheme to be cognisant of climate change risks and opportunities within their investment processes, and to annually report on how these risks and opportunities have been incorporated into the investment process.

The policy recognises that climate change will be subject to much further analysis and subsequent policy changes in the coming years. Trustees are supportive of adopting an evolving policy in order to ensure all relevant developments are captured. Trustees will also support government policy initiatives that contribute to the 2°C target. 'Engagement' is generally preferred to 'Exclusion' as a method of incorporating climate change risks into an effective fiduciary framework. However, investment managers can independently consider whether exclusion or engagement is more appropriate within their investment process. The development of asset classes that are supportive of obtaining the 2°C target is encouraged.

Financing adaptation measures

In order to mitigate the risks posed by the physical impacts of climate change, banks can provide financial services to companies or projects that aid adaptation, helping strengthen the resilience of ecosystems, societies and economies to climate shocks. Examples of adaptation measures outlined by the European Commission include using water resources more efficiently; adapting buildings for future climate conditions and extreme weather events; building flood defences and raising the levels of dykes; developing drought-tolerant crops; choosing tree species and forestry practices less vulnerable to storms and fires; and setting aside land corridors to help species migrate.⁷⁸

Section summary

Key focus areas for investor engagement with the banking sector on climate risk assessments and management:

- Comprehensive risk assessments analysing the impacts of different climate scenarios:
 - consideration of physical, transitional and liability risks
 - oversight by the Chief Risk Officer
 - assessments based on existing frameworks, e.g. FSB TCFD and CDP
 - focus on asset, company and country levels
 - public disclosure of results
- Incorporation of exclusion policies and client engagement:
 - end the provision of financial services for activities misaligned with <2°C pathways, with a particular focus on coal, oil and gas, and other high emission activities
 - <2°C aligned sector policies for high carbon industries, with objectives and timelines for client engagement and consequences for those unable to comply
 - robust accountability mechanisms and transparency around policy implementation
- Introduction of other ways to manage climate risks, for instance via:
 - IPO and bond prospectuses
 - recalibration of loan pricing
 - financing adaptation measures
 - adjustments in pension schemes

2. Low carbon products and services

While at a minimum, investors should ensure that banks are not exacerbating climate risks through their activities, forward-looking banks can go further and position themselves to gain from the upside opportunities associated with financing the low carbon transition. Staying within the <2°C carbon budget will require a transformation of industries across the world, which will not be successful without large injections of capital. The IEA estimates that in total the world needs to spend US\$359 trillion by 2050 to make the changes required to prevent high-risk temperature rises.⁷⁹ Banks can help satisfy this need for funding by providing loans using their own capital, adapting existing products and services, and underwriting new low carbon products and selling them on to investors.

This section first outlines how investors can engage with banks about the adoption of a systematic and credible approach to integrating low carbon opportunities across the bank's activities. It then provides examples of products and services that could be promoted across different business divisions. It ends with some underlying themes to guide investor engagement and assessment.

Development of a systematic approach

Investors should engage with banks to understand whether they are developing a systematic approach to integrating low carbon products and services across all their divisions. To assess if a bank is taking a comprehensive and company-wide approach, investors might inquire about the resources and capacity that has been allocated in each division. Banks might also establish internal systems, online platforms and working groups to help drive group-wide progress.

To understand how banks are identifying specific opportunities, investors might inquire whether firms have hired sustainability experts, developed new committees and departments, or joined initiatives that will help with the identification and advancement of low carbon products and services. For example, the Global Innovation Lab for Climate Finance draws on experiences from around the world to identify, design, and pilot the next generation of climate finance instruments.⁸⁰ KBC, a major Belgian bank focused on private clients and small and medium-sized enterprises (SMEs), has adopted a pioneering approach, using the SDGs as a framework to identify opportunities (see Box 8). The SDG Industry Matrix for financial services compiled by the UN Global Compact and KPMG could also be used to achieve this.⁸¹

Investors can ask banks whether they are utilising digital finance and fintech to advance the development of a group-wide approach. There could be options in leveraging fintech for environmental gains: for instance, banks might use data on clients' transactions to identify behaviours linked to high carbon processes. This data could then be used to offer efficient products and services with the aim of reducing high carbon consumption patterns in ways that can save clients money.

With the emergence of an increasing amount of 'green' initiatives, there is a risk that these developments do not meet high standards of social and environmental sustainability. For example, there are concerns that some green bonds are financing environmentally problematic activities including waste incineration, large-scale biomass and fossil fuels.⁸⁵ For instance, there were concerns that GDF Suez's green bond might have supported a project in Brazil that had various negative environmental

Box 8: Example of good practice – KBC

A particularly forward-thinking approach has been adopted by KBC.⁸² The bank uses the SDGs as a framework to develop sustainable products and services that meet clients' needs. In terms of climate, KBC is particularly focusing on SDG 7.2 (renewable energy), SDG 7.3 (energy efficiency), SDG 7.4 (energy infrastructure and new technology), and SDG 13 (direct and indirect footprint).

The bank has committed to increase the share of renewables in the total KBC Energy Credit Portfolio to at least 50% by 2030. KBC supports renewable energy, such as hydro, solar and wind, but abstains from financing biomass and biofuel activities, with the exception of small-scale biomass projects (processing waste materials from e.g. food industry or agriculture).^{83,84}

impacts, including increased deforestation in the Brazilian Amazon.⁸⁶ There is a need for greater transparency and appropriate verification. Eligible investments should be clearly defined before the issuance of a green bond, and actual allocation of proceeds should be disclosed.

Investors concerned about the verifiability of products might inquire if the bank supports international initiatives aimed at setting robust standards for different types of products, and whether it adheres to stringent requirements. Examples of international initiatives in the area of green bonds include the Green Bond Principles of the International Capital Market Association⁸⁷ and the Climate Bonds Standard of the Climate Bonds Initiative.⁸⁸ Collaboration between banks can help achieve consistency across the sector on the requirements for labelling a product or service as 'green'. Banks can be encouraged to support and contribute to the development of initiatives for other asset classes in order to ensure common criteria for comparability.

Questions for investor engagement

How does the bank approach the development of sustainable low carbon products and services across its business divisions? How much resourcing and capacity is being allocated to support their development?

How does the bank certify and monitor products and services to ensure they are genuinely socially and environmentally sustainable? Does the bank disclose information to allow stakeholders to assess the credentials of 'green' products?

Examples of low carbon products and services

This section provides examples of low carbon products and services that could be offered across banks' business divisions - both through the development of new products, and adjustment of existing products and services. Investors can encourage banks to explore the suggestions presented below, and use their purchasing power as clients to signal interest in further developments.

Investment banking

A recent success story has been the green bond market, which has grown from US\$3 billion in 2012 to US\$118 billion currently outstanding.⁸⁹ Growing investor demand for green investments⁹⁰ presents an opportunity for banks to be involved in underwriting this type of bond. Aside from green bonds, other examples include:

- Mergers & acquisitions: advise clients on climate risks and opportunities involved in buying or merging with a certain company
- Venture capital for innovative climate solutions and research and development (R&D)
- Leveraged finance: incorporate climate considerations when providing advice to financial sponsors of LBOs. As it is often the medium-term goal of the sponsor to sell the company, it is in their interest for the company to be sustainable and viable in the long-run
- Sell-side research and advisory services: provide climate-related advisory services to institutional investors. Some banks are already producing high-quality research in this field, such as HSBC's Climate Change Centre of Excellence.⁹¹ Through this, banks can contribute to informing and stimulating demand for a well-managed transition. Research findings can also be applied by the banks themselves.
- IPO support for companies in sectors required for and supporting the transition, such as renewable energy, energy storage, energy efficiency, low carbon transport, alternative mobility and recycling

Corporate banking

- Project finance for low carbon technologies and infrastructure, for example sustainable energy infrastructure (renewable energy, smart metres, energy efficiency,...), green transport projects, water and waste projects, or large-scale green commercial developments, for example shopping centres
- General corporate financing for companies in sectors required for and supporting the low carbon transition
- Climate-related advice linked to the provision of loans to help clients manage climate risk

Retail and commercial banking

- Green mortgages: mortgages with a focus on energy-efficiency, offering incentives for people to, for instance, install solar panels on their house, insulate better, and/ or offering advice on energy efficiency. This could be done in collaboration with energy providers, and could lead to the securitisation of these mortgages as green bonds
- Loans rewarding energy-efficient and low carbon behaviour, for instance incentivising clients to buy electric vehicles or financing their low carbon transition in other ways
- Green savings facilities, which offer a range of sustainability themes and allow clients to save or invest in green products
- Environmental advisory services to help clients manage environmental risks and opportunities – these could again be offered in collaboration with energy providers
- Green leasing, for example leasing structures for green technologies

Private banking

- Climate-related financial advisory services for asset management and estate management. There is also potential to educate wealthy clients about the potential positive impact of their wealth
- Low carbon investment funds

Questions for investor engagement

What low carbon products and services does the bank currently offer across its different divisions? How is the bank seeking to expand and promote these?

Box 9: Example of good practice – Ekobanken

The Swedish bank Ekobanken is a transparent bank for those who want to take responsibility for the influence of their money in society, how money is invested, and the origin of money that is lent.⁹²

The bank allows retail clients to choose how their deposits are used. Clients can either decide that their money is used in line with the bank's other investments, which already mainly go to operations that create social, environmental or cultural added value, or they can pick on a sector-level where their money should be invested. In this way, it is possible for clients to, for instance, put their money into sectors that promote climate protection.

Underlying themes

This section outlines some underlying themes to guide investor engagement around the development of a systematic low carbon approach across all banking divisions.

Support for new technologies and infrastructure

Some of the sectors that require increased funding and other types of financial services are the following (see table below):

Sector	Description of opportunity
Renewable energy	This sector includes, for instance, wind, solar and tidal energy. Investments in renewable energy continue to grow: 2015 produced a new record, with the amount of money committed to renewables rising 5% to US\$285.9 billion. ⁹³ Renewable energy investment funds currently yield between 5.5 and 7% in the UK, ⁹⁴ while in emerging markets yields can be more than double that. ⁹⁵ Moreover, renewable energy prices continue to decline rapidly. Record low tariffs were awarded in solar in 2016 across countries as diverse as India, the UAE, Chile, Argentina, Mexico and South Africa. The UAE saw the lowest solar tariff yet at US\$24 per Megawatt hour in September 2016 (a 60% reduction in just 18 months). ⁹⁶
Energy storage	This sector includes various types of batteries, and also thermal, electrical, mechanical, chemical and other electrochemical technologies. Investment in energy storage technology is vital for the success of renewable energy and its full integration into the energy sector. According to EY, investors should stop thinking that energy storage is something that will arrive tomorrow, but instead realise that it <i>“arrived yesterday, the game is already changing and investors need to ask themselves how they can use the technology to secure the necessary returns in the future”</i> . ⁹⁷ Battery storage technology costs, for instance, have been declining at an impressive rate. ⁹⁸ According to Moody’s Investors Service, the price of lithium-ion batteries has declined by more than 50% since 2010. ⁹⁹
Energy efficiency	This includes building retrofits (lighting, insulation, glazing), onsite generation (CHP, renewable heat, heat pumps), adaptation of industrial processes (motors, pumps, kilns) and infrastructure (street lighting, heat networks, transport, smart meters). ¹⁰⁰ Two-thirds of Europe’s low carbon energy infrastructure investments to 2040 will need to be in energy efficiency. ¹⁰¹ This represents an eightfold increase in current levels of energy efficiency investment. Avoided consumption from energy efficiency delivers sizeable financial returns; the avoided expenditure in IEA countries resulting from energy efficiency investments over the last 25 years can be valued at US\$5.7 trillion to energy consumers. ¹⁰²
Transport and alternative mobility	This includes hybrid and electric vehicles, efficient batteries, charging points, and public transport infrastructure. PPPs, particularly in project finance, might offer banks the opportunity to issue and syndicate loans. ¹⁰³
Recycling and waste	This includes recycling, wastewater treatment, waste to energy conversion and resource recovery. The UK Green Investment Bank views the commercial and industrial waste market as an attractive and investible asset class, with high forecast investment returns. ¹⁰⁴

Questions for investor engagement

How much exposure does the bank have to low carbon technologies and infrastructure? Is this publicly disclosed? What is the bank's plan to increase this over the next five years?

Questions for investor engagement

How is the bank facilitating the shift to a low carbon economy in the countries that it operates in? Does it take the NDCs into consideration when assessing growth areas?

Financing for the NDCs

Under the Paris Agreement, every country has issued NDCs, which outline its contributions to achieving emission cuts. Investors can encourage banks to assess the NDCs of the countries in which they operate, and align the development of products and services with the targets that have been set. For instance, the German government has agreed to reduce its GHG emissions by between 80% and 95% by 2050, compared with 1990 levels.¹⁰⁵ These efforts will be spread as follows: 66% for construction, 61% for energy, 49% for industry, 40% for transport and 31% for agriculture. Banks could focus on these priority areas identified by countries.

For banks that operate in emerging markets, climate goals are particularly important. Many emerging markets will be disproportionately affected by the impacts of climate change, and will require the most capital to develop low carbon infrastructure. Furthermore, energy demand in developing countries is set to increase, and it is critically important to ensure this demand can be met through low carbon energy sources.

Banks can be encouraged to explore the considerable opportunities linked to these growing markets. Developing economies have already jumped ahead of developed countries in terms of total new renewable energy investment. The share of global renewable energy investments accounted for by developing countries rose from 49% in 2014 to 55% in 2015, with the dollar commitment at US\$155.9 billion.¹⁰⁶

Financing the transition of high carbon sectors

Investors can inquire how banks are helping companies who have made commitments to transition to low carbon business models. As traditional high carbon sectors adjust to meet the needs of a <2°C world, they might require additional financial services – for instance, to acquire low carbon equipment or diversify into new areas. For example, DONG (Denmark Oil and Natural Gas) Energy, was originally set up to manage Denmark's North Sea oilfields four decades ago. The company has since diversified and is now the market leader in offshore wind.¹⁰⁷ DONG Energy has recently announced that it is considering selling off its oil and gas assets completely.¹⁰⁸

Use of public-private partnerships

Banks can be encouraged to consider innovative ways of supporting the infrastructure needs of a successful low carbon transition. Public-private partnerships (PPPs) are one vehicle to support infrastructure developments, for instance the 'One Belt, One Road' (OBOR) initiative in China and the 'EU Infrastructure Investment Plan', also known as the Juncker Plan. Banks could integrate low carbon and climate-resilient considerations into the terms of PPPs.

Section summary

Key focus areas for investor engagement with the banking sector on low carbon products and services:

- Adoption of a systematic approach to fully realise the opportunities associated with the low carbon transition:
 - dedicate resources for the identification, development, incorporation, promotion, quantification and disclosure of low carbon products and services
 - incorporate across all different banking divisions
- Consideration of underlying themes:
 - focus on renewable energy, energy storage, energy efficiency, transport and alternative mobility, and recycling and waste
 - emphasis on the NDCs of each country in which a bank operates
 - financing of the transition of high carbon sectors
- Avoidance of reputational repercussions:
 - adherence to best-practice criteria, to ensure green products and services are truly socially and environmentally sustainable

3. Policy engagement and collaboration with other actors

A successful transition to a low carbon economy will require various actions that fall outside the remit of the banking sector. This section describes how banks and their investors can help bring these wider changes about through policy engagements and collaboration with other actors. Combining skills and expertise will promote learning and make climate action more efficient and effective across the economy as a whole.

Policymakers

The financial sector possesses and deploys significant resources towards regulatory and policy engagement globally. Investors can engage with regulators and policymakers on the need for a legislative landscape supportive of the goals of the Paris Agreement, and can encourage banks to do the same. Relevant institutions to engage with include the Basel Committee on Banking Supervision. Efforts made in the insurance sector can be used as a starting point, with some firms already engaging considerably with policy makers on climate matters (see Box 10). Investors should also monitor the trade associations that banks are members of, and encourage banks to ensure that those associations are aligned with the interests of a low carbon transition.

Specific examples of policies that banks and investors could support include ending financial incentives for fossil fuel companies – such as public subsidies and tax breaks – and requiring better company reporting on climate risks. Investors in UK banks might see value in engaging with policymakers on the need for the UK to match the commitments of other countries in terms of green finance strategies, such as the Chinese Guidelines

for establishing the green financial system¹¹⁰ and the Dubai Declaration of financial institutions in the United Arab Emirates on sustainable finance.¹¹¹ This engagement could form part of the City of London's Green Finance Initiative, launched in January 2016 in partnership with the UK government.

Another proposal to explore concerns lowering the risk weighting associated with green investments, in comparison to high carbon investments, to overcome the burden of high capital requirements. Indeed, the French Banking Federation has recently called for the lowering of capital requirements for financing and investing in assets that support the low carbon transition.¹¹² The past has shown that this is possible: in the EU, an SME Supporting Factor was introduced into the post-crisis banking regulation, allowing a reduction in capital requirements with the aim of freeing up capital for additional SME lending.¹¹³ A survey carried out annually by the Global Alliance for Banking on Values (GABV) consistently demonstrates that sustainability-focused banks deliver better financial returns than those shown by the world's largest banks.¹¹⁴ This suggests that sustainable assets might carry a lower risk weighting.

To support the case for lower capital requirements for green financial products, investors can ask banks to contribute to the evaluation of whether green finance has a lower risk profile than non-green finance.¹¹⁵ For instance, a US study found that green mortgages – secured against energy efficient homes – have a 32% lower likelihood of default than traditional mortgages.¹¹⁶ This search for evidence should start with data collection: banks could be encouraged to 'green-tag' their lending, using environmental criteria, to establish whether green-tagged loans have a lower default rate.¹¹⁷

Box 10: Example of good practice – Policy engagement in the insurance sector

The insurance sector was one of the initial forces behind the UN Environment Programme's Finance Initiative (UNEP FI) in the late 1990s. Specifically, their messaging on the need for climate and sustainable finance policy to enable the financial system to fully get behind the energy transition stands out. While many sectors offer top-line support of a solution to climate change, insurers have often gone beyond this and called for detailed policy measures. For instance, in August 2016, Aviva, Aegon and Amlin – which together manage US\$1.2 trillion in assets – issued a joint statement urging world leaders to build on previous commitments and end fossil fuel subsidies within four years.¹⁰⁹

Questions for investor engagement

Is the bank using its engagements with policymakers and regulators, both directly and through industry associations, to promote an orderly transition to a low carbon economy?

More specifically, has the bank been engaging with policymakers on any legislation or policy designed to reduce GHG emissions? What policy outcomes has it advocated for?

If the bank operates internationally, is their climate change policy position aligned across different geographies, and if so, what mechanisms do they have in place to ensure this?

What trade associations is the bank a member of, and what are their positions on key climate issues?

best to operationalise the recommendations of the FSB TCFD across the sector. Collaboration between banks could also be helpful for developing common standards for green financial products and services.

Other companies, including financial services companies

For a successful economy-wide decarbonisation, companies across different sectors should think of and operationalise solutions together. Investors can ask how banks are collaborating with other firms to help accelerate these processes.

There are various areas in which banks could benefit from the expertise of other companies. For instance, banks can learn from the experience of insurance firms and credit rating agencies in terms of modelling various climate change scenarios. Moody's, for example, has recently announced that it will use Paris climate pledges to assess corporate financial risk.¹¹⁸ Another example are advisory services, where investors might see benefits in banks collaborating with energy providers or consultancies, which could help advise banks' clients on how to reduce their total lifecycle emissions. Such partnerships have been developed, for instance, by SAC Apoyo Integral (see Box 11).

Investors might also see value in banks collaborating with stock exchange companies, which are able to exercise influence on the listing requirements for companies. They could, for instance, encourage the integration of climate-related requirements and disclosures for listed companies.

Industry associations

No individual bank is able to, by itself, create the market required for supporting the low carbon transition. Investors can ask what collaborative measures banks are taking – for example, through industry associations – to help advance and standardise climate-related standards and best practice across the sector. For instance, investors could suggest that banks collectively decide how

Box 11: Example of good practice – SAC Apoyo Integral

SAC Apoyo Integral is a microfinance enterprise based in El Salvador.¹¹⁹ The institution is committed to the sustainable development of its clients through quality products and services. To achieve this, Integral has developed strong partnerships with companies from other sectors, such as Tecnosol, a solar energy company, and Salvosol, a company that has developed a small and mobile photovoltaic charging station working on solar power, targeting rural households lacking connection to the power grid. Through this, Integral is able to offer green products and services that are accompanied by free technical assistance.

Investors

In their capacity as clients, institutional investors should actively seek a dialogue with banks to voice their interest in low carbon investment products.

Academics, NGOs and think tanks

Other fruitful collaborations can take place with academics, think tanks and NGOs. This can contribute to ensuring the integration of a wider range of perspectives and experiences into the development of banks' climate strategies. A number of NGOs have devoted considerable attention to modelling the financial impacts of climate scenarios and the financial advantages of a low carbon transition. Additionally, engaging with local groups in the areas the bank operates might help it monitor and avoid unintended consequences of lending activities, for example, to companies involved in unsustainable practices.

Questions for investor engagement

Which companies, NGOs, think tanks and academics does the bank engage with? How has this helped shape its activities?

How does the bank survey clients of its sell-side activities to gauge demand for low carbon products and services? Once developed, how are these opportunities communicated to investors?

Section summary

Key focus areas for investor engagement with the banking sector on policy engagement and collaboration with other actors:

- Support a policy landscape conducive to the low carbon transition:
 - proactive engagement with policymakers and financial regulators, in partnership with other stakeholders, to support legislative and regulatory changes that will accelerate alignment with <2°C pathways
 - efforts to go beyond top-line statements of support for climate policy
 - ensure member trade bodies and industry associations take progressive positions on climate legislation
- Collaboration and knowledge-sharing around climate risks and solutions with other actors, for instance via:
 - industry associations and peer banks
 - alliances with other stakeholders – including other financial services companies and companies in other sectors, civil society, academics and think tanks

4. Implementation and monitoring

To support the company-wide integration of climate risks and opportunities, investors can encourage banks to develop, publish and implement climate change strategies supportive of the goals of the Paris Agreement. While this process will be dependent on each bank's internal structures, there are a few general areas described below which will apply for all banks. This section also considers how climate-related policies can be integrated into governance structures, and suggests accountability mechanisms to enable monitoring and evaluation.

Company-wide climate strategy

Investors should provide banks with a mandate to develop, publish and integrate forward-looking and company-wide strategies on climate change which describe how the bank will adjust its policies and practices to work towards key objectives of the Paris Agreement, including <2°C alignment. This strategy should contain measureable objectives and a timeline for implementation, supported by additional disclosures to enable monitoring and evaluation.

Investors can use the suggestions outlined in this report and elsewhere to assess the comprehensiveness of strategies and how they align with best practice, and engage with banks to ensure they address key risks and opportunities.

Questions for investor engagement

Does the bank have a company-wide strategy on climate change? Is it aligned with the goals of the Paris Agreement?

Does the strategy explain how the bank will address key climate risks and opportunities? How does it compare to best practice?

so that it is available to other stakeholders, including to clients, NGOs and the wider public.

Suggested areas for enhanced reporting can be found throughout this report, as well as in the TCFD recommendations¹²⁰ and other guidelines. For instance, disclosures might include the results of banks' climate risk assessments, their exposure to high carbon sectors, and provision of finance to industries supportive of the low carbon transition. Standardised disclosure frameworks will help investors to identify which banks are making the most progress in adapting for a low carbon world.

Board-level oversight

Board-level oversight is a crucial factor in ensuring the climate strategy is taken up effectively across the entire bank.¹²¹ Not only does it illustrate commitment to tackling climate risks at the highest levels, but it also enables the board to directly provide meaningful input. For instance, the board could establish a climate change subcommittee, which reports to the board about climate risks. Investors should ensure that board-level oversight is taking place, and might in some instances wish to engage on climate-related issues with board members directly.

Employee engagement

While board-level oversight is crucial, it is also important that other relevant employees understand and incorporate climate-related considerations into their work. Investors can suggest that banks' employees receive relevant trainings on climate change. These could be carried out through internal roadshows, web-based trainings and seminars. Existing training can be useful, such as that provided by the PRI Academy.¹²² Investors could also encourage sustainability factors to be fully integrated into the Chartered Financial Analyst (CFA) curriculum.¹²³

Reporting and accountability

Investors should request transparency around the delivery of climate strategies and policies to allow for their implementation to be monitored and evaluated. This information should be made public

Box 12: Example of good practice – Bank Negara Indonesia

Bank Negara Indonesia (BNI), one of the largest banks in Indonesia, requires human resources that are ethical and environmentally sensitive.¹²⁴ The bank's employees actively engage in sustainability forums, such as workshops on renewable energy and energy efficiency financing and other activities related to sustainable finance, including financial inclusion and climate change mitigation.

BNI improves the competence of employees through various training, development and education programmes. One of the focus areas for human resource development is ESG issues. These types of initiatives are required across the entire banking sector to ensure employees have access to all information required to do their jobs, and for better employee retention.

Adjustment of objectives, KPIs and remuneration policies

To accelerate the integration of climate change strategies, further measures to clarify objectives across the various banking divisions need to be developed and adopted. Investors should ensure that every division has a clear understanding of what is expected from them in terms of climate-related adjustments to their activities.

Investors could encourage banks to adapt objectives and key performance indicators (KPIs) to ensure that the aims of the climate strategy are being achieved and progress is being tracked. Investors might consider the revision of remuneration policies, including executive remuneration, or the integration of climate KPIs into objectives of various departments and individuals.

Questions for investor engagement

Are there public disclosures of the bank's climate strategy and its implementation?

How does the bank compare to its peers in terms of progress in key areas?

Is there board-level oversight of the climate strategy?

How is awareness of climate-related risks and opportunities raised across the entire organisation?

How are objectives, KPIs and remuneration policies being adjusted?

Section Summary

Key focus areas for investor engagement with the banking sector on implementation and monitoring:

- Development and publication of long-term, company-wide climate strategies:
 - explicit support for the Paris Agreement and <2°C target
 - inclusion of timelines and milestones for implementation
- Enabling of external progress monitoring and evaluation:
 - enhanced disclosures and reporting on the implementation of the climate strategy
- Incorporation of the climate strategy into governance and operational structures, for instance via:
 - board-level oversight
 - staff trainings
 - KPIs and incentives

Investor toolkit

Measures for investors

For shareholders

- Clearly articulate climate-related expectations to banks in private engagements (meetings, calls, corporate engagement days) along with timelines for achieving them. These engagement objectives could be based on this report and other recommendations
- Identify and measure progress against key milestones towards reaching engagement objectives, applaud sector leaders and highlight laggards
- If a bank is unforthcoming on objectives, escalate the engagement by:
 - joining collaborative investor initiatives and other public means of engagement (for instance via investor statements)
 - using legal tools, such as complaints to the FRC
 - filing or supporting special shareholder resolutions
 - voting against management on items such as the remuneration policy or the re-election of the Chairman
- If the company completely fails to engage or shows no signs of progress, shareholders can divest if the bank is held in an active fund or take appropriate alternative action if the bank is held in a passive fund (such as voting to remove board members)

For clients of banks' sell-side services

- Signal demand for low carbon products and services through inquiring about green investment opportunities and research and through allocating more capital to these areas
- Use climate rankings of banks to inform decisions on whom to give business to
- If a decision is made against a bank based on its climate-related performance, inform the bank of this decision

Questions for investor engagement

This is a non-exhaustive list of questions investors can ask banks as part of their engagement, compiled by pulling out key issues highlighted throughout the guidelines. More detailed questions are included in the relevant sections of this report.

Climate risk assessments and management

- Is the Chief Risk Officer involved in the assessment and management of climate-related risks? Are they driving these assessments forward across the bank?
- Which frameworks are used to assess climate risk, and at what levels are these assessments carried out? How does the bank ensure all areas of climate risk are captured?
- Is a third party employed in this process, for either risk compilation or verification?
- Does the bank make the results of these assessments publicly available?
- What specific measures have been put in place to mitigate climate risks? How is the bank looking to improve these?
- More specifically, is the bank excluding certain projects or sectors, or engaging with high carbon clients about adjusting their business activities? If exclusions take place, how are these decisions made? If engagement takes place, are there timelines by which clients have to reach certain targets?
- What accountability mechanisms does the bank have in place to allow stakeholders to monitor the implementation of policies?

Low carbon products and services

- How does the bank ensure that its approach to developing, offering and promoting low carbon products and services is systematic across the entire bank? What resources are dedicated to achieving this?
- Does the bank have targets to increase its exposure to low carbon sectors, or provision of low carbon products and services?
- Does the bank use the NDCs to help identify priorities within each country it operates in?

- Has the bank made efforts to finance the transition of high carbon sectors? Are there any specific examples?
- How does the bank ensure that 'green' products and services are truly socially and environmentally sustainable? Which criteria does the bank adhere to and how can it guarantee that these are sufficiently stringent? Is there any third party verification involved?

Policy engagement and collaboration with other actors

- Does the bank engage with policymakers to accelerate the low carbon transition? What specific policies has the bank advocated for? Are the bank's policy positions on climate change aligned across different geographies?
- What other actors does the bank collaborate with on climate-related issues? What has this collaboration achieved so far, and what are the bank's future plans?

Implementation and monitoring

- Does the bank have a company-wide climate strategy aligned with the goals of the Paris Agreement? If it does not yet have one, by when will the bank have developed and published one?
- Is there board-level support of the climate strategy, and does the board oversee its implementation?
- How does the bank ensure that sufficient information about the implementation of the climate strategy is provided to allow for its evaluation?
- How are employees educated and motivated to drive forward the aims of the climate strategy?
- How is this climate strategy incorporated into governance and operational structures? Are there any KPIs or targets?

Conclusion

The role of banks in achieving a successful and orderly <2°C transition is crucial, and the sector therefore deserves increased attention from investors. Not only can banks help avert high-risk climate scenarios by diverting capital away from high emission activities, but the sector can also become a key facilitator of the low carbon transition. These changes would bring about portfolio-wide benefits for investors seeking to reduce exposure to climate risk. Investors should seize the opportunity to engage with the potentially most impactful sector within their portfolios. While this will be no small feat, and will require considerable and sustained efforts, this report offers a starting point and guide for investor engagement with the banking sector on climate change.

Appendix 1: Risk assessment tools

Scenario analysis

A scenario analysis uses a simulation technique to gauge how certain potential future scenarios will affect a company. Various models are used to assess vulnerability to different climate-related scenarios, linked to physical, transitional and liability risks and ranging from high carbon, business-as-usual scenarios (with 4°C to 6°C of temperature increases) to low carbon, <2°C scenarios. The different scenarios banks might decide to focus their analysis on will depend on their views about the ambition of policymakers and companies and the scope and speed of technological advances. According to the FSB TCFD, companies should disclose these underlying assumptions associated with the climate-related scenarios used.¹²⁵

Risk factors that are linked at varying degrees to these scenarios will include natural disasters, inequality and poverty, migration, air pollution, soil erosion, water stress and the availability of energy and natural resources.¹²⁶ They will also include transitional risks, such as legislative changes to support the low carbon transition, technology breakthroughs and the emergence of new, low carbon markets.¹²⁷

Value at Risk (VaR) analysis

As part of this scenario analysis, VaR analysis can help to assess the value that various climate change scenarios will put at risk. VaR is a statistical technique used to measure and quantify the level of financial risk within a firm or portfolio over a specific time frame. It determines the potential for loss in the entity being assessed, as well as the probability of occurrence for the defined loss.

Historical methods to calculate VaR will not be useful here, because climate change is a new type of risk that has not affected value in the past. Instead, banks can use an Options Valuation Model to ensure future risks are taken into account when calculating the VaR, as explained below. HSBC has come up with a different way of calculating VaR in the oil and gas sector, based on a specific scenario.¹²⁸ They carried out ceiling tests, calculating how selected high carbon companies would perform under a US\$50/b price for oil and a US\$9/mmBtu price for gas.

Options Valuation Model

Traditional valuation methodologies, such as Discounted Cash Flow (DCF) analyses, might not be appropriate if applied in the context of climate change, as they are generally static tools which work best when future conditions are relatively certain.¹²⁹ Investors can encourage banks to make use of alternative methodologies. One such alternative has been proposed by the Banking Environment Initiative (BEI): an Options Valuation Model.¹³⁰ It suggests a model based on DCF analysis, but enhanced by allowing for managerial flexibility to adapt to changing market conditions over time. This is particularly useful for the energy sector, where there is currently a lot of uncertainty. Banks and investors typically have to apply qualitative analysis to traditional DCF calculations in these circumstances.

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Acknowledgements

ShareAction would like to thank everyone who has contributed towards the writing, reviewing and editing of this report. The rich variety of feedback – from investors, NGOs, banks and academics – has allowed us to draw upon the knowledge and experience of a multitude of perspectives. We would like to offer special thanks to Bob Buhr and Lauren Compere for being so generous with their time.

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ShareAction (Fairshare Educational Foundation) is a registered charity that promotes responsible investment practices by pension providers and fund managers. ShareAction believes that Responsible Investment helps to safeguard investments as well as securing environmental and social benefits.

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