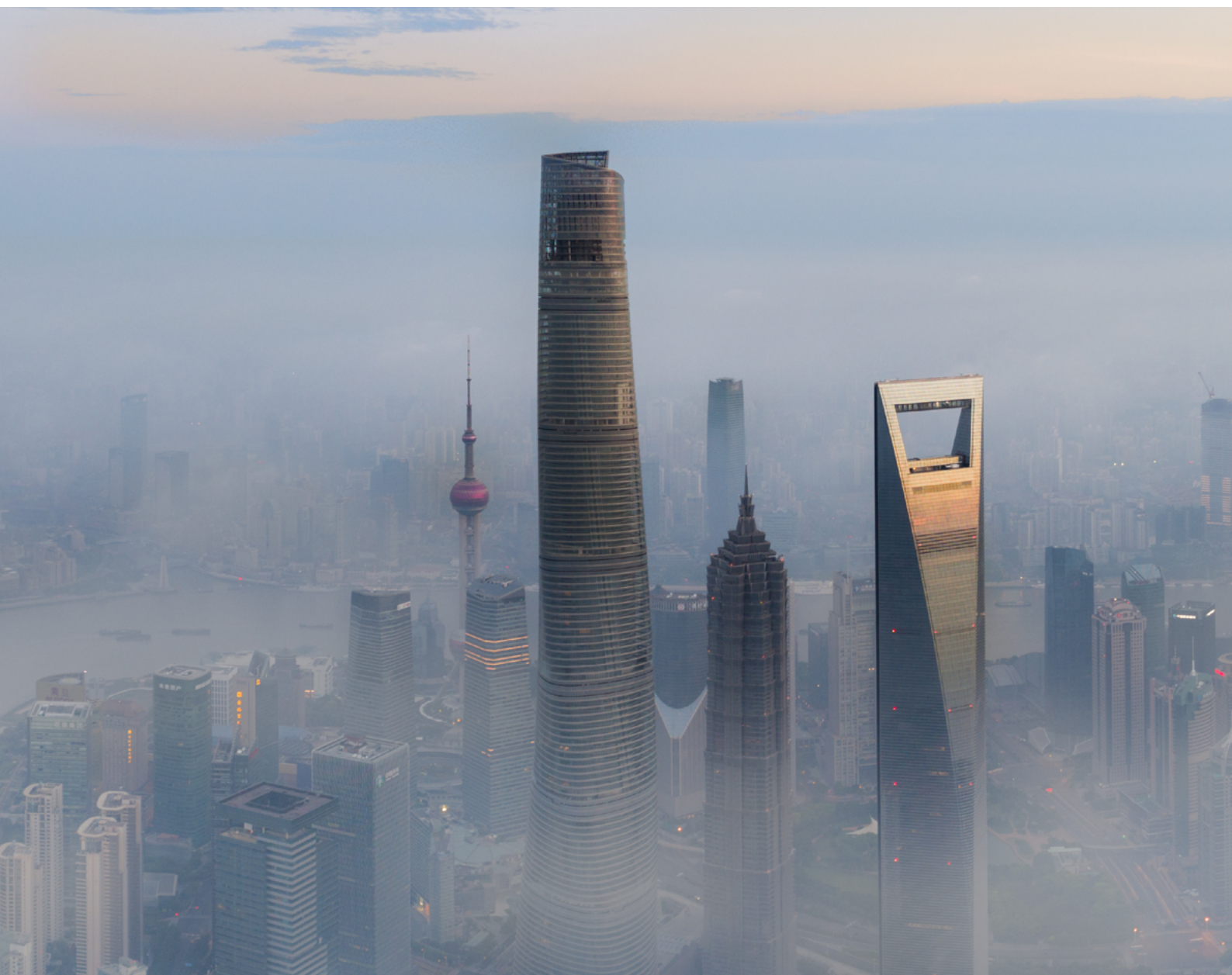




standard
chartered

Task Force on Climate-related Financial Disclosures
(TCFD) 2020

► Facilitating climate action where it matters most ◀



Standard Chartered is a leading international banking group

– with a presence in 59 of the world’s most dynamic markets. Our purpose is to drive commerce and prosperity through our unique diversity, and our heritage and values are expressed in our brand promise, Here for good.

Contents

4	Governance
4	Structural overview
8	Assessing and managing climate-related risks and opportunities within our business
10	Training and awareness building
13	Incentives structure
16	Strategy
16	The external and regulatory landscape
18	Our approach to climate change
18	Accelerating sustainable finance
22	Reducing our direct and financed emissions
23	Managing the financial risk from climate change
24	Assessing our resilience
30	Climate risk toolkit
30	Investing in risk quantification – our toolkit and partnerships
30	Physical risk
35	Transition risk and temperature alignment
35	Additional climate data
36	Academic advisors – Imperial College London
40	Risk
40	Risk definition and taxonomy
40	Overview of risk management processes
41	Climate Risk Appetite Statement
41	Embedding climate risk as a material cross-cutting risk
43	Credit risk
43	Corporate, Commercial and Institutional Banking (CCIB)
49	Consumer, Private and Business Banking (CPBB)
52	Operational risk
55	Country risk
60	Reputational risk
61	Compliance risk
63	Traded risk
63	Capital and liquidity risk
66	Metrics and Targets
66	Metrics to accelerate sustainable finance
67	Metrics to reduce our direct and financed emissions
73	Managing the financial risk from climate change
80	Appendices
80	Appendix 1
81	Appendix 2
84	Appendix 3
85	Appendix 4
86	Appendix 5
87	Appendix 6

We employ more than 83,000 people and our businesses serve four types of client across four regions, supported by nine global functions.

Our client segments:

- **Retail Banking** – serving more than nine million individuals and small businesses.
- **Commercial Banking** – supporting more than 45,000 local corporations and medium-sized enterprises across Asia, Africa and the Middle East.
- **Corporate & Institutional Banking** – serving more than 5,000 large corporations, governments, banks and investors.
- **Private Banking** – helping more than 7,500 clients grow and protect their wealth.

In January 2021, we streamlined our four separate businesses into two: Corporate, Commercial and Institutional Banking (CCIB) and Consumer, Private and Business Banking (CPBB). See page 21 of our **Annual Report** for more details. We make the most of our deep roots in rapidly developing Asian, African and Middle Eastern markets to seek out opportunities at every turn. We have been operating in these regions for more than 160 years, providing banking services, and supporting growth, where and when it matters most. We focus on supporting customers who trade, operate or invest across our unique footprint. What sets us apart is our diversity – of people, cultures and networks.

Our regions:

- **ASEAN & South Asia (ASA)** – our largest markets by income are Singapore and India. We are active in all 10 ASEAN countries.
- **Europe & Americas (EA)** – centred in London and New York with a presence across both continents. A key income originator for the Group.
- **Greater China & North Asia (GCNA)** – serving clients in mainland China, Hong Kong, Korea, Japan, Taiwan and Macau. The Group’s largest region by income.
- **Africa & Middle East (AME)** – present in 25 markets, of which the most sizeable by income are the UAE, Nigeria and Kenya.

These regions and networks provide us with a unique opportunity to mobilise capital to support climate adaptation and mitigation to areas of greatest need, and require us to play a leading role in understanding and responding to climate risks as they arise across economies and in our financing.

Our approach to sustainability is framed around a **Sustainability Philosophy** which sets out how we integrate sustainability into our organisational decision-making, a suite of Sustainability Aspirations that provide tangible targets for sustainable business outcomes aligned to the Paris Agreement and UN Sustainable Development Goals, and **Position Statements** that set out our environmental and social client standards. Further information on our approach to Sustainability can be found on pages 62 to 71 of our **Annual Report**, or in our standalone **Sustainability Summary**.

+ More information is also available in our **Sustainability Summary** at [sc.com/sustainabilitysummary](https://www.sc.com/sustainabilitysummary)

+ Read more on our Climate Change Position Statement <https://www.sc.com/en/sustainability/position-statements/climate-change/>

Task Force on Climate- related Financial Disclosures





This report is our third disclosure pursuant to the recommendations of the Financial Stability Board's Task Force on Climate-related Financial Disclosures (TCFD) recommendations.

We are making strong progress; this 2020 report provides substantial additional information on our approach and the capabilities we have developed during the year, showing our progress in aligning to the TCFD recommendations. Through this report, which builds upon our **Sustainability Summary** and **Climate Change Position Statement**, we aim to further enhance transparency and engagement with our stakeholders on the topic of our response to climate change.

Our progress has not been made alone. Recognising our intention to facilitate climate action where it matters most, we have worked with an ecosystem of partners as diverse as clients, academics, specialist consultancies and intergovernmental organisations. We will continue to do so in the coming years.

We recognise that there remains much work still to be done. Whatever context you are reading this in – client, investor, civil society or otherwise – we welcome your comments, your input and your support in this shared endeavour.

Figure 1: Summary of Standard Chartered's TCFD response

Pillar	TCFD recommendation	Summary of Standard Chartered's response	See pages
Governance 	(a) Describe the Board's oversight of climate-related risks and opportunities.	Board and Board-level committees support robust oversight and clear responsibilities.	4 to 7
	(b) Describe the management's role in assessing and managing the climate-related risks and opportunities.	The Management Team is responsible for execution of the climate strategy, and is supported by the necessary resources (people, toolkits and external expertise).	4 to 7
Strategy 	(a) Describe the climate-related risks and opportunities the organisation has identified over the short, medium and long term.	We have taken clear steps to build climate assessment capabilities and apply these to our portfolios, and assessed the capital needed for selected climate outcomes across our footprint. The Group has undertaken granular top down and bottom up (e.g. at a client level) scenario analysis for specific asset classes.	18 to 23
	(b) Describe the impact of climate-related risks and opportunities on the organisation's businesses, strategy and financial planning.	Initial gross transition risk scenario analysis shows potentially significant credit impacts from 2035, but that our assessment capabilities (including assessment of clients' transition and adaptation plans) are at initial stages and evolving. We are creating transition frameworks, and already reducing appetite for selected high-carbon sectors such as coal, while seeking more comprehensive strategic planning integration.	18 to 23
	(c) Describe the resilience of the organisation's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario.	Scenario analysis is still evolving, aided by exploratory regulatory stress tests scheduled over 2021, and there is scope to increase coverage within and across asset classes. Initial assessments so far demonstrate that within the planning horizon (five years) and significantly beyond, the Group's strategy is reasonably resilient against orderly and disorderly 2°C transition scenarios.	24 to 27
Risk 	(a) Describe the organisation's processes for identifying and assessing climate-related risks.	We have designated climate change as a material cross-cutting risk. How climate risk manifests across various risk types, the risk management actions that inherently control against climate risks and the additional substantial work undertaken to analyse the climate risk impact better are described in the Risk section.	40 to 63
	(b) Describe the organisation's processes for managing climate-related risks.		
	(c) Describe how processes for identifying, assessing and managing climate-related risks are integrated into the organisation's overall risk management.		
Metrics 	(a) Disclose the metrics used by the organisation to assess climate-related risks and opportunities in line with its strategy and risk management processes.	Our preliminary insights from various risk analyses are provided in the Metrics section.	66 to 77
	(b) Disclose Scope 1, Scope 2, and if appropriate Scope 3 greenhouse gas (GHG) emissions and the related risks.	We disclose comprehensive information on Scope 1 and 2 emissions, and a growing range of information related to Scope 3 emissions.	69 to 70
	(c) Describe the targets used by the organisation to manage climate-related risks and opportunities and performance against targets.	Building on our existing Sustainability Aspirations, we will set internal targets against relevant risk metrics in 2021.	66 to 77





Governance

- 4 Governance
- 4 Structural overview
- 8 Assessing and managing climate-related risks and opportunities within our business
- 10 Training and awareness building
- 13 Incentives structure

Governance

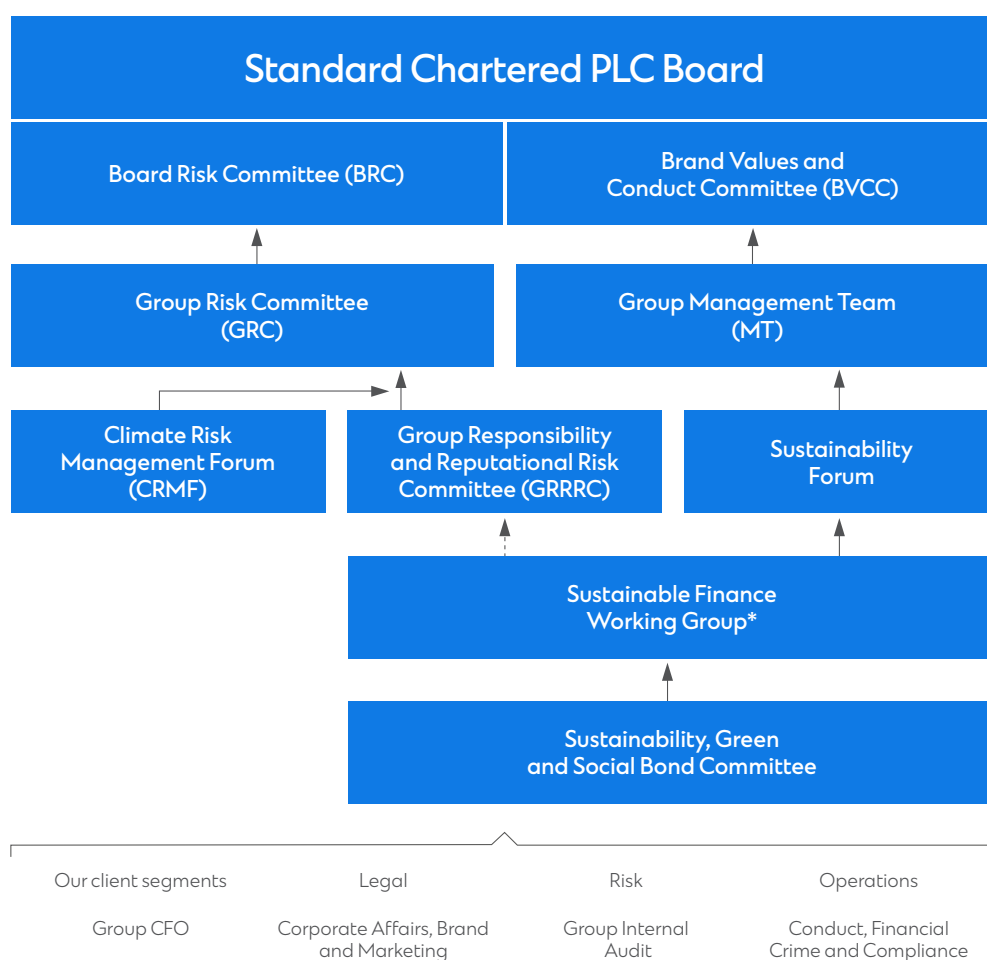
Robust governance underpins everything we do at Standard Chartered. Climate change and its associated risks, opportunities and organisational implications are overseen by Standard Chartered Plc (the Group)'s Board, Management Team and multiple supporting sub-committees.



The structure of the Group's Board and Management Team (MT) can be found on pages 83 to 89 of the [2020 Annual Report](#).

Structural overview

Figure 2: Structural overview of Standard Chartered's climate change governance



* The Sustainable Finance Working Group reports to the Sustainability Forum for 2020. In 2021, this will become the Sustainable Finance Governance Committee and will report to the GRRRC.

Standard Chartered PLC Board

Our Board is responsible for our long-term success, and for ensuring that the Group is led within a framework of effective controls. The Board is made up of individuals with a diverse range of experience and backgrounds, and several members hold considerable expertise in climate-related risk and opportunity. As a result, the Board and its supporting committees consider climate-related issues when reviewing and guiding strategic decisions.

For example, progress against the Group's climate risk workplan and risk reporting metrics are overseen by the Board Risk Committee, which also receives climate risk updates six times a year through the Group Chief Risk Officer's (CRO) report. We have a Board approved Climate Risk Appetite Statement and since January 2020, climate risk was incorporated in our central Enterprise Risk Management Framework (ERMF) and designated as a material cross-cutting risk. The Board also reviewed drafts of the 2021 Management Reporting Metrics.

Progress against climate-related goals and targets is monitored by the Board's Brand, Values and Conduct Committee (BVCC) which receives updates on the progress against the Group's Sustainability Aspirations as well as receiving intelligence on stakeholder perspectives.

Management Team

The Management Team (MT), led by Group Chief Executive, Bill Winters, comprises of 13 senior representatives from across Standard Chartered's geographical footprint, business segments and functions.

In response to the Prudential Regulatory Authority (PRA) Supervisory Statement 3/19 "Enhancing banks' and insurers' approaches to managing the financial risks from climate change", in 2019 we assigned responsibility for managing the risks arising from climate change to the CRO, as the appropriate Senior Management Function under the Senior Managers Regime.

The CRO is supported by the Global Head, Enterprise Risk Management who has day-to-day oversight and central responsibility for the Group's second line of defence against climate risk.

In recognition of the cross-cutting nature of climate-related risks and opportunities, each MT member is responsible for strategically driving and embedding climate issues into their own business area or function. The MT received periodic updates during the year on topics including how we measure and manage operational emissions, our approach to net zero for our portfolio, and progress against meeting regulatory expectations for managing climate risk.

Influencing the external market on climate

Tracy Clarke, Regional CEO of Europe & Americas and Private Banking (retired end December 2020), elevated the profile of climate risk within the business, speaking publicly on the importance of preparing for the low-carbon transition and the need for banks such as Standard Chartered to prepare for the risks.

Our CEO, Bill Winters, chairs the Taskforce for Scaling Voluntary Carbon Markets, which is an international private sector platform looking to put in place a scalable and liquid voluntary carbon market to allow companies to meet their net-zero and broader emissions reduction commitments. The Taskforce was initiated by Mark Carney and has been set up to work in much the same way as the Task Force on Climate-related Financial Disclosures.

Bill is also a representative at other leading international forums dedicated to tackling climate change, such as the World Economic Forum's CEO Climate Leaders Alliance and Sustainable Markets Initiative.

Our Chairman, José Viñals is the Group's lead representative in the United Nations' Global Investors for Sustainable Development (GISD) Alliance which has ambitious objectives to scale up private sector investment for the Sustainable Development Goals including SDG13 climate action. In 2020, the GISD collaborated on research to harmonise and scale up sustainable finance.

Governance committees and steering groups

The Board and MT are supported in their responsibilities by several committees responsible for the regular management and monitoring of climate change and its associated impacts on the Group.

Details of their responsibilities and processes for reviewing climate-related issues are set out in Figure 3.

“We have a Board approved Climate Risk Appetite Statement and since January 2020, climate risk was incorporated in our central Enterprise Risk Management Framework (ERMF) and designated as a material cross-cutting risk.”

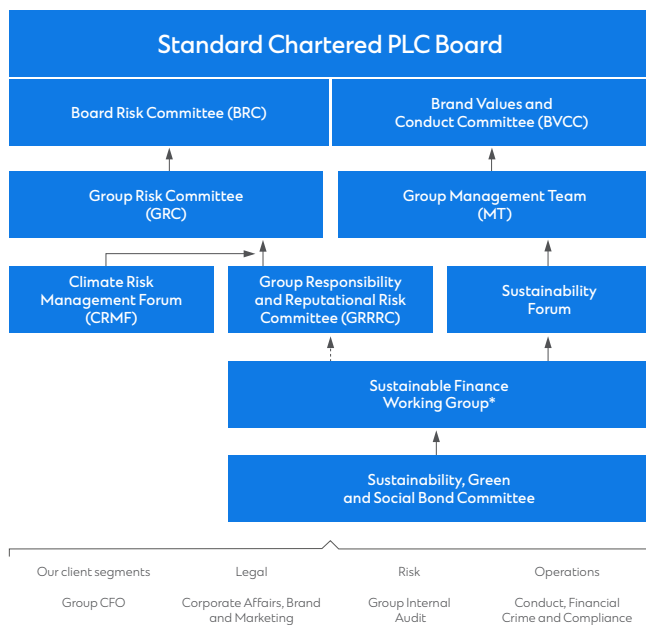


Figure 3: Governance committees and steering groups with responsibility for climate-related issues

Governance body	Chair	Climate risk agenda frequency	Purpose and responsibilities related to climate-related issues	Discussion topics, review areas and climate-related material decisions made in 2020
Board Risk Committee (BRC)	Independent Non-Executive Director	Climate risk updates to BRC in CRO reports six times a year. One dedicated discussion with BRC and wider Board annually.	<ul style="list-style-type: none"> Provide oversight of the Group's key risks on behalf of the Board. Consider the Group's Risk Appetite and make recommendations to the Board on the Risk Appetite Statement (RAS). Robustly assess risk types (including climate risk) and the effectiveness of risk management frameworks and policies. Provide oversight and challenge of the design and execution of stress and scenario testing, including for climate risk. 	<p>Reviewed:</p> <ul style="list-style-type: none"> Progress updates on the Group's climate risk workplan including matters for escalation. Qualitative assessment of climate risk as part of the approval of the Group's five-year corporate plan. Climate risk reporting metrics and management information. <p>Approved:</p> <ul style="list-style-type: none"> Climate RAS. The ERMF and its elevation of climate risk as a material cross-cutting risk.
Brand Values and Conduct Committee (BVCC)	Independent Non-Executive Director	Periodic updates on climate-related Sustainability Aspirations	<ul style="list-style-type: none"> Review the Group's key sustainability priorities including the Group's Position Statements, Sustainability Aspirations and its approach to community engagement against external commitments. 	<p>Reviewed:</p> <ul style="list-style-type: none"> Updates on progress against Sustainability Aspirations, including climate commitments. Proposed amendments to Position Statements, including those in high-carbon sectors for 2021.
Group Risk Committee	Group Chief Risk Officer	Quarterly Climate risk updates in CRO reports 11 times per year.	<ul style="list-style-type: none"> Ensure the effective management of Group risk in support of the Group's Strategy. Oversee implementation of the Enterprise Risk Management approach. Review risk appetite and approve risk appetite metrics for Principal Risk Types (PRT) and material cross-cutting risks, including climate risk. 	<p>Reviewed:</p> <ul style="list-style-type: none"> Detailed updates on the Group's progress against the climate risk workplan. Regulatory updates on climate risk and the Group's response, including the regulatory stress test requirements. Approach to measuring financed emissions.

Governance body	Chair	Climate risk agenda frequency	Purpose and responsibilities related to climate-related issues	Discussion topics, review areas and climate-related material decisions made in 2020
Climate Risk Management Forum (CRMF)	Group Chief Risk Officer	Quarterly	<ul style="list-style-type: none"> Oversee development and implementation of the climate risk framework. Oversee all aspects of risk management practices for climate-related financial and non-financial risks, including leadership and oversight in developing and effectively implementing the Group's climate risk management framework. Provide structured governance around engagement with relevant PRTs impacted by or linked to climate risk. 	<p>Reviewed:</p> <ul style="list-style-type: none"> Progress and challenges associated with integrating climate risk into PRTs. Qualitative assessment of climate risks impacting the corporate plan. Climate disclosures such as TCFD. Research and development on climate risk with Imperial College London. Benchmarking against best practice.
Group Responsibility and Reputational Risk Committee (GRRRC)	Group Head of Corporate Affairs, Brand and Marketing, and Conduct and Financial Crime Compliance	Four times per year	<ul style="list-style-type: none"> Review and approve climate-related Position Statements, which include sector-specific transition criteria, and associated risk tolerance thresholds. 	<ul style="list-style-type: none"> Reviewed and approved climate-related Position Statements. Discussed transition plans.
Sustainability Forum	Group Head of Corporate Affairs, Brand and Marketing, and Conduct and Financial Crime Compliance	Five times per year in 2020. This will increase to eight times per year in 2021.	<ul style="list-style-type: none"> Oversee development and implementation of the Group's vision to be the world's most sustainable and responsible bank. Guide a co-ordinated Group-wide approach to key sustainability themes including climate change. Agree and monitor Sustainability Aspirations. 	<ul style="list-style-type: none"> Discussed and agreed a Group-wide climate plan focused on operational impacts and engagement and oversaw delivery. Considered carbon footprint measurement and pricing mechanisms for operations and supply chain.
Sustainable Finance Working Group (Became the Sustainable Finance Governance Committee on 1 January 2021)	Global Head of Sustainable Finance	Quarterly	<ul style="list-style-type: none"> Provide leadership, governance and oversight in delivering the Group's sustainable finance offering. Review and endorse products to be able to carry the sustainable finance label. Guide the Group in identifying and embracing opportunities and reviewing the reputational risks relating to sustainable finance. 	<ul style="list-style-type: none"> Reviewed and approved new climate finance products prior to approval, such as a loan product in Kenya to support installation of residential solar power. Guided the Group's approach to systematically identifying all sustainable and climate finance credit exposures. Oversaw the update of the Group's Green and Sustainable Product Framework, encompassing a range of climate finance activities.
Sustainability, Green and Social Bond Committee	Global Head of Sustainable Finance	Quarterly	<ul style="list-style-type: none"> Agree content and implementation of Sustainability Bond Framework. Guide the Group in identifying and embracing opportunities relating to Sustainability, Green and Social Debt Issuance. Manage the process for project evaluation and selection and provide final review of the eligible projects for all Sustainability, Green and Social Debt Issuance from the Group and its subsidiaries. 	<ul style="list-style-type: none"> Conducted annual review of the Sustainability Bond Framework. Reviewed Sustainable Finance allocation and impact reports.

Assessing and managing climate-related risks and opportunities within our business

Our approach to, and monitoring of, climate change is managed by our Group Sustainability team, along with the Sustainable Finance and Climate Risk teams. These teams work wholly or substantially on climate change.

Within the Corporate Affairs, Brand and Marketing function, a dedicated Group Sustainability team is responsible for developing the Group's sustainability strategy and supports the Group's stakeholder outreach, including leading participation in a number of industry collaboration platforms and initiatives on climate. The outputs from these are used to help inform the Group's sustainability strategy including on climate change. The team is also responsible for leading development of the Group's sustainability disclosures including this TCFD report.

The Sustainable Finance team sits within our client business segment and is responsible for sustainable finance products and frameworks, and environmental and social risk management.

The Climate Risk team within Enterprise Risk Management has second line of defence responsibilities for climate risk, which includes tools and methodologies for risk identification, measurement and management, integration into risk frameworks and processes, reporting and training across first and second lines of defence.

The Climate Risk team delivers the day-to-day set-up, advancement and roll-out of climate risk-related governance, risk management, scenario analysis and disclosure for the Group.

Because climate risk requires changes to operations and process across the Group, the Climate Risk team works closely with other risk specialists, business areas and functions, helping them build knowledge and skills. For example, the 2021 biennial exploratory scenario (BES) is centrally coordinated by the Enterprise Stress Testing team within Finance, supported by the Climate Risk team with inputs from various specialists across both first line (e.g. sector specialists, relationship managers, sustainable finance, credit and portfolio management) and second line experts (e.g. senior credit approvers, and relevant risk framework owners such as country risk). As such, while Figure 4 provides the number of staff who work wholly or substantially on climate risk and opportunities, most colleagues in the Group have a role to play in managing climate risk as part of their roles and responsibilities, and are increasingly starting to do so.

The central Climate Risk team provides support to regional teams as they incorporate requirements on climate risk set at Group level, and also provides specialist input to regional teams leading responses to local regulatory requirements.

Operationally, our Property teams at both Group and market levels set the strategy and deliver initiatives that both minimise our environmental impact and contribution to climate change and mitigate the impact of climate risk to our operations.

Figure 4: Full time equivalent (FTE) staff dedicated wholly or partially to supporting climate risk and opportunities

Line of defence	Department	FTE 2020	FTE 2019
First line	Sustainable Finance and Environmental and Social Risk Management (ESRM)	23	14
	– Sustainable Finance	12	6
	– ESRM	11	8
Second line	Climate Risk	5	4
N/A	Group Sustainability	4	2

In addition, since its adoption as a material cross-cutting risk, climate risk has become increasingly integrated across the Group, and a regular feature on the agendas of other governing bodies and committees. Examples of such integration are demonstrated below.

Figure 5: Different committees' and forums' role in understanding impact of climate risk

Committee	Example topics discussed and/or planned
Non-Financial Risk Committees	Property Non-Financial Risk Committee owns our property location strategy, enabling discussion in relation to physical climate risk.
Private Banking Process Governance & Risk Committee	Implications of climate risk on Private Banking clients.
CCIB Risk Committee	Implications of climate risk to CCIB clients as risk profiles are finalised.
Stress Testing Committee	The key requirements of the 2021 BES and a summary of the PRA's Discussion Paper.
Enterprise Risk Management Forum	Overall climate risk profile and review of half-yearly and annual reporting disclosures.
Regulatory Developments Assessment Forum	High-level overview of climate risk regulatory activity each quarter, developments in key jurisdictions and Standard Chartered activity.
Regional and Country-level Risk Committees	As climate risk considerations are increasingly rolled out to regions through the ERMF, implication of climate risk at regional and country level discussed, e.g. guidance on transition risk while reviewing credit concentrations.

At a Group, regional and market level our governance committees considering climate change draw on input and representation from a range of functions. These include:

Our client segments

Our client segments are subject to impact from climate risk, as well as taking advantage of climate opportunities to support clients in mitigating transition risks and adapting to physical impacts. Our Sustainable Finance team, incorporating our dedicated ESRM team, plays a central role in this process through their ownership and development of the Sustainable Finance strategy and sectoral Position Statements and Environmental and Social Risk Assessments applying to clients across different segments.

Conduct, Financial Crime and Compliance

Our Compliance function plays a critical role in supporting the Group's identification of, and adherence to, regulatory obligations. During 2020, as part of our wider enterprise risk efforts on climate risk, we undertook a dedicated integration of climate risk into our compliance risk type to ensure we remain compliant with rapidly developing obligations across our footprint.

Group CFO

Strategy The Group Strategy team is responsible for guiding the development of the Group's strategy including reflecting this in the Corporate Plan process. During 2020, as part of the Sustainability Forum, Group Strategy helped to plan the Group's approach to managing its operational emissions footprint as well as contributing to efforts to further the Group's 2018 commitment to measure, manage and reduce emissions from financing.

Investor Relations The Group's debt and equity investors have shown early and growing interest in how we are responding to climate risks and opportunities. Our Investor Relations team supports our active engagement with the investor community including on climate and wider Environmental, Social and Governance (ESG) matters.

Legal

Group Legal helps identify, manage and mitigate legal risks facing the Group, and provides legal support to the Group's businesses and functions to help them deliver on the Group's strategic objectives. In this capacity, Legal plays an enabling role in embedding our climate risk approach across multiple risk types and related processes.

Risk

As previously discussed, the central Climate Risk team within Enterprise Risk Management is responsible for the day-to-day set-up, advancement and roll-out of climate risk-related governance, risk management, scenario analysis and disclosure to the Group.

As climate risk is being integrated into impacted PRT Frameworks, responsibility for second line ownership of climate risk specific to each PRT is delegated to the relevant Risk Framework Owner in Compliance, Credit Risk, Capital & Liquidity, Operational Risk, Country Risk and Reputational Risk. For example, Reputational Risk Leads have second line risk acceptance authority on climate-related reputational risks and the Climate Risk team provides input on topics such as understanding the temperature alignment for clients or transaction.

Corporate Affairs, Brand and Marketing (CABM)

Our dedicated Group Sustainability team which leads our sustainability strategy sits within the CABM function.

Group Internal Audit (GIA)

GIA is an independent function whose primary role is to help the Board and Executive Management to protect the assets, reputation and sustainability of the Group by acting as a third line of defence. GIA's mandate is defined by the publicly-disclosed Audit Charter. There is no aspect of the organisation which GIA is restricted from looking at as it delivers on its mandate. During 2020, GIA continued to develop its capabilities on climate including through developing an internal newsletter and dedicated training sessions.



Read our Audit Charter at (https://av.sc.com/corp-en/content/docs/Group-Internal-Audit-Charter_Jan-2018.pdf)



“As a material cross-cutting risk, climate risk has become increasingly integrated across the Group, and a regular feature on the agendas of other governing bodies and committees.”



Training and awareness building

Ensuring robust understanding of climate-related risks and opportunities is crucial for employees at all levels of the organisation.

As a new risk type, skills and expertise in managing climate-related risk and opportunity across the industry are in the early stages. We are committed to rapidly developing the necessary expertise with support from external partners and subject matter experts.

The Group Board received initial dedicated training on climate risk in 2019 and the Chairman has undergone one-to-one training. During 2020, the Boards of the Group's subsidiaries across Asia, Africa and the Middle East were provided with in-depth, targeted training on topics including climate risk, sustainability strategy, sustainability regulation and environmental and social risk management, delivered by internal subject matter experts. Several MT members have also completed the Climate Risk Foundation course, developed and delivered with Imperial College London.

“Really well assembled course – that has tremendous impact for a key leg of CCIB’s strategy.”

Simon Cooper
CEO, CIB and CB, Europe & Americas

In 2020, our training programme included:

Climate-related financial and non-financial risks: Dedicated training on climate risk was delivered in-person or through videoconferencing by the Climate Risk team to more than 1,000 colleagues. This included webinars open to all, and targeted training for job roles such as Regional and Country Chief Risk Officers, Credit Officers, Compliance Officers, Credit Analysts, Group Internal Audit, and CCIB and Retail Banking business colleagues.

Content included an introduction to physical and transition risks, how these present a risk to the financial system, impact on PRTs; the Group's climate risk workplan; regulatory expectations; and for some, a deeper dive into scenario analysis and stress testing.

New for 2020 was our digital training curriculum in Climate Risk and Sustainable Finance. Launched in October 2020, the climate risk digital training course was designed for Standard Chartered by Imperial College London and features external experts from academia and business, bringing in external knowledge and academic insights. By 31 December 2020, 360 colleagues had completed the training.

In addition, a webinar and report on energy transition scenarios and financial risks in India was delivered in 2020 as part of the long-term research we are funding Imperial College London to undertake, helping support industry-wide learning across the globe.

We also sponsored the [Climate Investment Challenge](#), aimed at graduate students and enabling the next generation to develop creative financial solutions and innovations to address climate change.

“Since the establishment of the Sustainable Finance team in 2019, there has been a concerted focus to train our frontline staff on environmental and social risk management.”

Sustainable Finance and Environmental and Social Risk

Management: Our dedicated Sustainable Finance team has focused on training our frontline staff on environmental and social risk management in the form of targeted training and our sustainable finance e-learning launched in 2020.

In addition, we launched the first phase of the Sustainable Finance Academy which is open to all employees. Training covers topics including the opportunities from sustainable finance; trends and recent developments; and the Group's product framework governance structure and product offering/capabilities.

In July 2020, our international panel law firm, Linklaters, held training for the Sustainable Finance team on the EU Sustainable Finance Taxonomy and how the technical screening criteria on climate adaptation and mitigation will impact our clients. This was recorded and shared on our intranet pages for all interested colleagues to access.

Our Sustainable Finance Champions programme is a network where knowledge and developments on sustainable finance are shared and disseminated throughout the Group. The Champions programme continues to grow rapidly, with approximately 880 members from all areas of the Group involved at the end of 2020.

The programme provides an opportunity for members to share ideas and receive training on a variety of sustainable finance and ESG topics. In 2020, training included a session on the Group's approach to climate risk and our commitment to develop a methodology to measure, manage and ultimately reduce the CO₂ emissions from the activities we finance.

Other awareness raising

Throughout 2021, we will continue our focus on upskilling and capacity building around climate-related issues. Plans include hiring a dedicated resource to develop all Sustainable Finance training including climate finance and accelerating the roll-out of job-role specific training on both climate risk and opportunity. For example, in collaboration with Baringa Partners, a leading climate change modelling and consultancy group, we will focus on upskilling our Relationship Managers on climate risk to enable stronger engagement with our clients.

“As a new risk type, skills and expertise in managing climate-related risk and opportunity across the industry are in the early stages. We are committed to rapidly developing the necessary expertise with support from external partners and subject matter experts.”



Case study 1

► Making climate risk learning digital in 2020 ◀

In 2020, we took a significant step forward in raising awareness on climate risk, supporting our staff to learn new skills through a new Climate Risk Foundation training course, hosted on our internal learning platform diSCover. We teamed up with scientists at Imperial College London, our academic partners, bringing the outside expert perspective in and equipping staff with the basics on climate change and climate risk in order to begin applying it to their roles, such as in client conversations for frontline staff, or considering energy efficiency in our own operations.

The short course includes videos, readings, research tasks and knowledge checks across multiple modules that staff can use at their convenience. Given the disruption caused by COVID-19, this course provided an ideal, remote way for staff to learn about climate risk from their own homes.

Example topics within the Climate Risk Foundation:

- Professors from Imperial College London explain why our planet is heating and the aims of the Paris Agreement
- External experts from academia and policy, plus Standard Chartered's own staff discuss:
 - Climate risk taxonomy, including physical and transitions risk and how these present financial risk
 - The financial and environmental benefit of using renewable energy over fossil fuels
 - How carbon pricing and government policies can be used as tools to reduce emissions
 - Shareholder demands on how companies should be responding to climate risk and supporting the low carbon transition
 - The regulatory expectations on banks and how Standard Chartered is responding
 - Questions Relationship Managers should bear in mind when talking to clients to understand their physical and transition risk

“Sustainability measures are also incorporated into our long-term incentive plan, which forms part of variable pay for the Group Management Team and executive directors.”

Incentives structure

We incentivise and reward colleagues for sustainability achievements through the inclusion of sustainability metrics in our annual and long-term incentive plans.

Selected Sustainability Aspirations, including those with a climate change dimension, are incorporated into our annual Group Scorecard which informs variable remuneration for all colleagues under our Target Total Variable Compensation plan, including the executive directors and Group Management Team. Sustainability measures formed four per cent of our Group Scorecard in 2020 and included our commitment to mobilise USD35 billion towards clean technology between 2020 and 2024 (see page 19), and our goal to reduce emissions from business flights by seven per cent during 2020 (see page 22).

Sustainability measures are also incorporated into our long-term incentive plan, which forms part of variable pay for the Group Management Team and executive directors.

As well as the Group Scorecard, dedicated climate and sustainability related objectives apply across functional and regional scorecards, including the Risk function, and individual objectives add a further link between sustainability and reward. Specifically, in relation to the delivery of core aspects of our climate change approach, the individuals and teams set out in Figure 6 may have objectives which impact variable remuneration.

In addition to the impact from scorecards and objectives, climate risk is considered as part of the overall assessment of the Group's principal risks when determining the size of the Group's total variable remuneration.

Figure 6: Individuals or teams with objectives that impact variable remuneration

Individual or team	Objectives/Performance linkage
Chief Risk Officer	Senior Management Function responsibility under the Financial Conduct Authority's Senior Managers Regime, second line of defence for climate risk.
Global Head, Enterprise Risk Management and Global Head, Risk Governance and Enterprise Risks	Day-to-day oversight of climate risk developments, and line management of Climate Risk team.
Climate Risk team	Delivery of the Group's approach to climate risk management, development of tools and methodologies for risk identification, quantification, management, monitoring and reporting; engagement with internal and external experts; building capacity and skills for climate risk management across three lines of defence and organisation wide.
Sustainable Finance team	Income targets for Sustainable Finance products and services, including delivery of relevant Sustainability Aspirations targets.
Clean Technology team, and other climate finance origination teams	Revenue targets for origination of climate finance.
Group Sustainability team	Development of the Group's climate strategy, including stakeholder perception.
Property team	Delivery of emissions reduction targets and operational Net Zero strategy as articulated in Sustainability Aspirations.



Strategy

- 16 **Strategy**
- 16 The external and regulatory landscape
- 18 Our approach to climate change
- 18 Accelerating sustainable finance
- 22 Reducing our direct and financed emissions
- 23 Managing the financial risk from climate change
- 24 Assessing our resilience

The external and regulatory landscape

We consider climate change to be one of the greatest challenges facing the world today, given its widespread and proven impacts on the physical environment, and human health, and its potential to adversely impact economic growth. Our unique footprint gives us the opportunity to engage with a wide range of stakeholders, including clients, governments, civil society and academics on the impacts of climate change, and leverage finance where it is needed most.

We recognise the role of the financial sector in achieving the 2015 Paris Agreement goals of holding the increase in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit temperature increase to 1.5°C, supporting climate adaptation, and directing finance flows towards a low carbon transition. Since 2018 we have pledged to align the emissions from our operations and financing of clients to the Paris Agreement goals, and in 2021 will work to the higher ambition level of net zero consistent with 1.5°C temperature alignment.

Figure 7: The regulatory landscape



During 2020, we saw a range of regulatory action, or proposals, in the area of climate change and the financial services sector. Figure 7 demonstrates some of these, and we anticipate the number of actions increasing in the coming years. These present a challenge where either the objectives pursued by regulators and supervisors, or the tools utilised in pursuit of these objectives, differ and thus result in fragmentation of response.

We welcome the efforts of organisations such as the Network for Greening the Financial System (NGFS) and the Financial Stability Board's work on climate risks and financial stability. We have embraced the opportunity to engage with national regulators and international platforms during 2020 and will continue to do so in 2021.

We have also seen continued interest in our climate approach from the Group's debt and equity investors,

including in our progress and our disclosures. We have sought to reflect these expectations in this TCFD report.

We have taken a range of internal actions and made public commitments consistent with the fight against climate change over the past decade (see Figure 8), supporting financial flows towards climate mitigation, and working to better understand climate risks. Climate change is a shared global challenge. We see collaboration with clients, peer banks, industry experts and regulators as key to overcoming the collective challenges in the approach to managing climate risks and participate in a wide range of trade associations. As we do so, we actively work to support advocacy positions that are consistent with our climate strategy and in alignment with the Paris Agreement goals. See Appendix 1 for a list of the platforms and initiatives we support.

Figure 8: A snapshot of our commitment and action on climate change.

2007			2008	2009	2010		
Signed Corporate Leaders Group Communiqué on Climate Change and UNEP-FI Declaration on Climate Change			Set Clinton Global Initiative target to mobilise 2007 USD8-10 billion towards renewable energy and clean technology 2007-12	Formed Renewable Energy & Environmental Finance team	Set long-term energy reduction targets for our own footprint, to reduce our climate impacts	Developed Environment and Climate Change policy, bringing together our actions	Published Climate Change Position Statement
2016	2017	2018					
Updated Climate Change Position Statement, including a target to fund and facilitate USD4bn towards clean technology 2016-2020 and a commitment to end direct financing of coal mines	Designated climate change as a Principal Uncertainty in our risk management framework Publicly supported TCFD recommendations	Signed the Katowice commitment jointly with four other banks		Published commitment to end direct financing of new coal-fired power plants, and to work to measure and ultimately reduce the impact of emissions associated with our financing. Released Prohibited Activities list including Arctic oil and gas and tar sands	Formed new Sustainable Finance team, to help bring capital to sustainability and climate solutions where it matters most		
2019							
Formed a new central Climate Risk team to develop our approach to managing climate-related risks	Climate risk governance strengthened as Senior Management Responsibility for climate risk designated to the GCRO and Board and Group Risk Committees Terms of Reference extended to include climate risk	Climate Risk Appetite Statement approved by the Board	Created a comprehensive workplan to develop and implement a climate risk framework	Published financed emissions ‘white paper’ Announced approach to coal-dependent clients, and new \$35bn renewable financing target 2019-2023	Imperial College London appointed as our academic advisor on climate risk		
2020							
Strengthened our central Enterprise Risk Management Framework to include climate risk as a material cross-cutting risk		Qualitative inclusion of climate risk into stress testing through the annual Internal Capital Adequacy Assessment Process (ICAAP)	Invested in and acquired tools for measuring transition risk and physical risk – initial outputs published in TCFD	Climate risk integrated into Reputational and Country Risk Frameworks, with other risk types including credit and operational risk under development	Imperial College London climate risk digital training made available for all staff		

Our approach to climate change

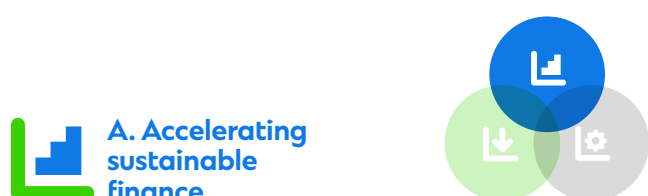
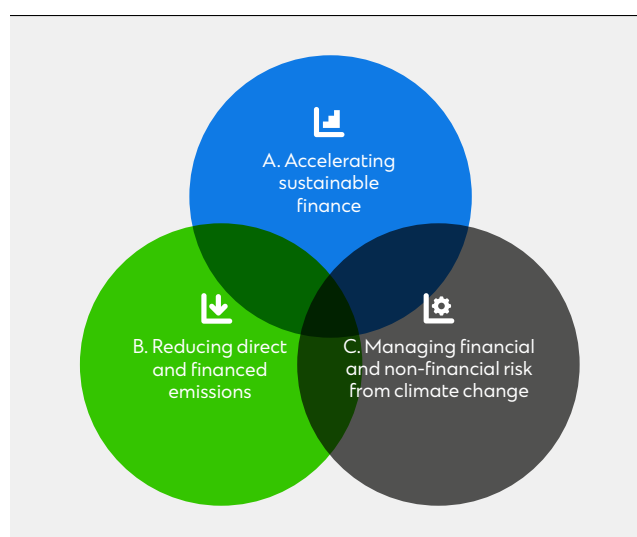
Our climate strategy is structured around three pillars, reflecting the ways in which we contribute to climate change, and our exposure to the risks arising from climate change:

A. Accelerating sustainable finance by supporting the net zero transition (e.g. renewable energy) and building resilience to physical climate risks (e.g. adaptation infrastructure), providing finance in the locations.

B. Reducing our direct and financed emissions in alignment with the Paris Agreement goal to limit global warming to below 2°C.

C. Managing the financial risk from climate change by developing the ability to systematically identify and assess climate risk and building this into our mainstream risk management practices and governance.

Figure 9: Our approach to climate change



We recognise the scale of the opportunity to provide financial services that support sustainable development, including climate action consistent with the Paris Agreement goals. Standard Chartered has a unique role to play, being present in both developed markets and with a footprint which encompasses emerging markets across Asia, Africa and the Middle East.

We have worked, and continue to work, to quantify this opportunity. In January 2020, we released our landmark report 'Opportunity 2030' which showcases the critical role of the private sector in meeting the UN's SDGs over the next decade, and the opportunity to do so in 15 of the fastest-growing economies. The report included a focus on SDG 7 'Affordable and Clean Energy', showing investment potential of more than USD700 billion in India, nearly USD150 billion in Indonesia and more than USD70 billion in Bangladesh. Capturing these opportunities is informing our approach as we enhance our climate finance capabilities, such as the partnerships we are forming with parties including institutional investors, sovereigns, academia and civil society.

Our dedicated Sustainable Finance team drives the growth of our sustainable finance product portfolio to support sustainable development, with products underpinned by a robust approach to governance. To assist in capturing and promoting these opportunities, we have established a Sustainable Finance Steering Group. The Steering Group is a monthly forum chaired by the Global Head of Sustainable Finance and made up of senior representatives from various business teams who discuss sustainable financing opportunities, including climate-related financing, across our footprint.

All products with a sustainability dimension, including climate, must be reviewed by the Steering Group prior to being launched. Our **Green and Sustainable Product and Bond Frameworks**, developed in collaboration with Sustainalytics and reviewed annually, was updated in 2020 and sets out what qualifies as 'sustainable' and 'green' products. Regular updates are provided to the CEO of our CCIB client segment.



Access our Green and Sustainable Product Framework at sc.com/sustainablefinanceframework

Recognising our role in channelling capital flows from institutional investors located in Europe and the Americas towards opportunities across our footprint, we are also active in addressing the barriers to such capital flows. In November 2020, we published our '\$50 Trillion Question' report, developed in dialogue with a panel of 300 of the world's largest investment management firms with total assets under management of over USD50 trillion. This demonstrated a bias towards deploying capital in developed markets, despite investors' acknowledgment of outperformance in emerging markets. The report detailed factors driving these decisions including political risk and the role of governments. The report also detailed the critical role of data, and standardisation of measurement.

We will continue to work on these themes in 2021, playing our role in removing obstacles to climate action across our markets – including the critical role of clear government policies to upholding the Paris Agreement goals and creating stable and predictable transition pathways for key economic sectors, and working across and beyond the financial sector to embed TCFD-aligned climate reporting and more detailed and consistent metrics to inform decision-making.

These endeavours will be substantially supported by the Bank of England's Biennial Exploratory Scenario (BES) analysis exercise on climate risk in 2021. As detailed throughout this TCFD report, we have been developing our capabilities and engaging our clients in support of this. We believe the BES offers an excellent opportunity to improve our understanding of our clients' businesses through the data and insights

“The good news is that we are having impact where it matters most, with 91 per cent of our sustainable finance assets located in emerging markets.”

we collect, and through this identify further opportunities to help advise clients on their transition journeys, and provide further financing for both adaptation and mitigation.

In support of this, we produced and shared a range of client insight materials during 2020 on topics including facilitating adoption of solar power, the role of blended finance in funding energy transitions, and the role of hydrogen.

We periodically update our Sustainability Aspirations, and in 2020 set a stretching new target committing to fund and facilitate USD75 billion of sustainable infrastructure and renewables by 2024 and embedded this into relevant business scorecards.

While the growth of sustainable finance has been encouraging, we know that impact matters just as much as volume, and the challenge to date has been how to measure the impact sustainable finance projects are making.

In 2020, we published our first annual **Sustainable Finance Impact Report** to provide investors with the much-needed transparency on the impact of sustainable finance assets. We have gathered and analysed data that helps us quantify the impact of our EUR500 million Sustainability Bond issued in 2019, and for the first time disclose the USD3.9 billion of Sustainable Assets that are aligned to the UN's SDGs in our Sustainable Finance portfolio. These include loans to renewable energy, healthcare and education as well as Microfinance and small to medium enterprise (SME) lending in low-income countries.

[+ Read our Sustainable Finance Impact Report at sc.com/SFimpactreport](https://www.sc.com/SFimpactreport)

The good news is that we are having impact where it matters most, with 91 per cent of our sustainable finance assets located in emerging markets and 86 per cent in some of the world's least developed nations. Our network means that we are providing finance in emerging markets where the need for funding as a positive catalyst for change is greatest; for example, financing a solar project in India will help avoid more than seven times the CO₂ from a similar-sized project in France, given the current sources of power on those countries' grids.

The report showed that from July 2019 to July 2020, our green projects helped us to avoid 738,998 tonnes of CO₂ emissions – the equivalent of 217,000 people's annual emissions in low- and middle-income countries.

Other successes throughout the year include launching new products such as extensions to our Sustainable Deposit offering, with 'evergreen' or rolling rather than time-limited options, a Sharia-compliant version, and making the deposit accessible to our Private Banking clients. These products are referenced to our **Green and Sustainable Product Framework**, meaning that they support the flow of capital towards climate-related activities including renewable energy, energy efficiency and climate change adaptation.

[+ Access our Green and Sustainable Product Framework at sc.com/sustainablefinanceframework](https://www.sc.com/sustainablefinanceframework)

In addition, and reflecting a burgeoning and rapid increase of interest across our footprint, we led and participated in a range of innovative transactions including a transition sukuk for Etihad airlines, see case study 3 on page 21.

We continued to see significant interest in sustainable investing from our Private Banking clients during the year, with July 2020's Private Banking Sustainable Investing Review showing that as many of 90 per cent of investors surveyed expressed an interest in sustainable investments, and climate action ranking in the top three UN SDGs by perceived importance. This continues to show the importance of our Sustainability Aspirations for Private Banking clients, which are intended to enable them to bring these preferences into their investment choices.

To support our efforts, we have substantially grown our Sustainable Finance team across Standard Chartered's footprint markets with new hires to cover the breadth of additional opportunities.

Figure 10: 2020 Sustainability Aspirations: Sustainable Finance

Aspiration	Target	Target date	Status	Progress
Infrastructure				
Everyone should have access to safe, reliable and affordable power and infrastructure which transforms lives and strengthens economies.	Facilitate project financing services for USD40 billion of infrastructure projects that promote sustainable development that align to our verified Green and Sustainable Product Framework.	Jan 2020 – Dec 2024	Not on track ¹	2020: USD2.4 billion
Climate change				
Climate change is one of today's greatest challenges and addressing it is essential to promote sustainable economic growth.	Facilitate USD35 billion worth of project financing services, M&A advisory, debt structuring, transaction banking and lending services for renewable energy that align to our verified Green and Sustainable Product Framework.	Jan 2020 – Dec 2024	On track	2020: USD18.4 billion

¹ The COVID-19 pandemic impacted the pace of delivering three new Aspirations set in 2020 focused on infrastructure, microfinance and retail. These Aspirations underpin sustainable development and we remain committed to progressing these targets in 2021. More detail on all Aspirations can be found at [sc.com/sustainabilitysummary](https://www.sc.com/sustainabilitysummary)

Case study 2

▶ EcoGreen International Group Limited ◀

Standard Chartered acted as Mandated Lead Arranger and Bookrunner, Underwriter (MLABU), and Facility Agent in the successful closing of a USD185 million syndicated Green Term Loan Facility (Facility) for EcoGreen International Group Limited (EcoGreen).

Headquartered in China, EcoGreen is a leading fine chemicals company. With a long-standing relationship since 2010, Standard Chartered is one of EcoGreen's core banks.

We identified EcoGreen Company as an ideal candidate for a Green Loan thanks to its environmentally friendly facilities which are highly recognised by the local government in China. After introducing the concept, we were successful in securing EcoGreen's debut Green Loan. The proceeds from the transaction will refinance EcoGreen's existing indebtedness and finance capex and general working capital need, which are to be applied in accordance with its certified Green Finance Framework.



Case study 3

▶ The world's first transition sukuk ◀

Sustainable and responsible climate action remains one of the most significant challenges facing the aviation industry today. During 2020, we capitalised on our superior financial expertise, leadership in sustainability and unique geographical reach to play a key role in supporting Etihad Airways (Etihad) in its transition journey as it aims to halve its net carbon emission levels by 2035 and cut net emissions to zero by 2050.

With Standard Chartered acting as Joint Sustainability Structuring Agent, in November 2020 Etihad issued the airline's inaugural USD600 million Sustainability-Linked Transition Sukuk. This landmark issuance is the first transition or sustainability-linked issuance for the Middle East and the global aviation industry, the first sustainability-linked sukuk globally, and the world's first ever combination of both a sustainability-linked element and transition use of proceed.

Etihad intends to use the funds for more energy-efficient aircraft and research and development into sustainable aviation fuel. The sukuk also includes a commitment from the airline to purchase carbon offsets should it fail to meet its short-term target to reduce the carbon intensity of its fleet.

B. Reducing our direct and financed emissions

Our operations

We are committed to reducing the climate change impacts of our own operations, setting medium- and long-term targets. These are intended to demonstrate the actions necessary to mitigate the most severe physical impacts of climate change, as well as enabling the market for net-zero goods and services needed to support a climate transition.

We achieve this through minimising the use of natural resources in our business operations, where we have set targets to improve energy and water efficiency, reduce paper consumption and manage emissions from air travel (see Figure 11).

This creates opportunities as more renewable power is required globally to meet the Paris Agreement. We are committed to procuring as many clean energy products as possible to enable us to meet this target. We are actively

seeking to procure clean, private power purchase agreements (PPAs) across the globe and already do so in the UK. Low carbon grids already exist in Zambia and France and we are engaged in clean PPAs across India.







Our suppliers

We also recognise our indirect exposure and contribution to climate impacts through the goods and services we procure from our suppliers. This manifests itself both through physical impacts on suppliers and supply chains which may impact the Group's operations and ability to serve its clients, as well as the carbon emissions associated with our procurement of goods and services. During 2020, with the oversight of the Sustainability Forum and Management Team, we developed an approach for measuring the emissions from our supply chain over the coming years. The implementation of this approach is reflected in our updated 2021 Sustainability Aspirations (see pages 440 to 441 of our [Annual Report](#)) and Group Scorecard.

Our Supplier Charter requires suppliers to support and promote environmental protection, support us in the use of goods and services which help mitigate our environmental impact, and promote the development and distribution of environmentally friendly technologies to reduce emissions.

[Read our Supplier Charter at \[sc.com/suppliercharter\]\(https://sc.com/suppliercharter\)](#)

Figure 11: 2020 Sustainability Aspirations: Climate Change

Aspiration	Target	Target date	Status	Progress
Climate change				
Climate change is one of today's greatest challenges and addressing it is essential to promote sustainable economic growth.   	Develop a methodology to measure, manage and ultimately reduce the CO ₂ emissions from the activities we finance	Jan 2019 – Dec 2020	Achieved	Methodology developed for corporate clients to measure alignment with the Paris Agreement.
	Only provide financial services to clients who are: By Jan 2021, less than 100% dependent on earnings from thermal coal (based on % EBITDA at group level)	Jan 2020 – Jan 2030	On track	After our coal-dependent client review during 2020, four clients across our portfolio were identified as 100 per cent dependent on thermal coal. We have ceased new business with all four clients and are exiting these relationships subject to any outstanding contractual arrangements.
	By Jan 2025, less than 60% dependent on earnings from thermal coal (based on % EBITDA at group level)			
	By Jan 2027, less than 40% dependent on earnings from thermal coal (based on % EBITDA at group level)			
	By Jan 2030, less than 10% dependent on earnings from thermal coal (based on % EBITDA at group level)			
Environment				
Reducing our own impact on the environment will protect our planet for the benefit of our communities.   	Reduce annual greenhouse gas emissions (Scope 1 and 2) to net zero by 2030 with an interim target: Dec 2025: 60,000 tCO ₂ e	Jan 2019 – Dec 2030	On track	2020: 117,859 tCO ₂ e 2019: 146,313 tCO ₂ e
	Source all energy from renewable sources	Jan 2020 – Dec 2030	On track	2020: 7.4% sourced
	Reduce our Scope 3 value chain emissions from business travel by 7%	Jan 2020 – Dec 2020	Achieved	2020: 63.9% reduction
	Introduce an emissions offset programme for Scope 3 travel emissions	Jan 2020 – Dec 2020	Achieved	
	Join the Climate Group 'RE100'	Jan 2020 – Dec 2020	Not achieved	RE100 was closed to new financial sector participants while they reviewed their entry criteria in 2020. We are committed to joining in 2021.
	Reduce annual office paper use by 57% to 10kg/FTE/year	Jan 2012 – Dec 2020	Not achieved	2020: 11.20 kg/FTE/year 2019: 16.96 kg/FTE/year
	Reduce waste by 50% per colleague to 40kg/FTE/year	Jan 2020 – Dec 2025	On track	2020: 64 kg/FTE/year
	Recycle 90% of waste	Jan 2020 – Dec 2025	Not on track	2020: 23% recycled

In line with the banking industry's approach, we prioritised the corporate loan asset class for this exercise. Our next priority is to extend the methodology to other applicable asset classes and explore more appropriate alternatives for certain asset classes against a rapidly evolving methodological landscape.

We set a 2020 Sustainability Aspiration to reduce our emissions from business air travel, and to offset the residual emissions. Given the context of COVID-19, our air travel emissions were significantly below levels expected when we set the target and we have reflected this in our target framework for 2021 and beyond. We purchased and retired emissions offsets equivalent to the emissions from our air travel in 2020 and will continue and extend this offset programme in 2021.

Our clients

Our main impact on the environment and climate change is through the business activities we finance. Our seven Position Statements outline the cross-sector standards we expect of ourselves and our clients, as well as sector-specific guidance for those clients operating in sectors with a high potential environmental impact.

These draw on International Finance Corporation (IFC) Performance Standards, the Equator Principles (EP) and global best practice. Our Prohibited Activities list sets out the activities we do not finance and can be found on [sc.com/prohibitedactivities](https://www.sc.com/prohibitedactivities).

We identify and assess environmental and social risks related to our CCIB clients and embed our environmental and social risk framework directly into our credit approval process. For Debt Capital Markets (DCM) transactions there is an established name clearance process for a bespoke review on the Bonds (where the use is for general corporate purposes) to determine if there is any exposure to environmental or social risks. As previously described, all relationship managers and credit officers are offered training in assessing environmental and social risk against our criteria, as well as access to online resources.

For more about the technical standards we apply in working with clients, please see our framework document and the **cross-sector** and **sector-specific** requirements in our **position statements**.

As documented in our Power Generation Position Statement and associated Sustainability Aspiration, in 2019 we committed to only provide financial services to clients who:

- By 2021, are less than 100% dependent on thermal coal (based on % EBITDA at group level);
- By 2025, are less than 60% dependent on thermal coal (based on % EBITDA at group level);
- By 2027, are less than 40% dependent on thermal coal (based on % EBITDA at group level);
- By 2030, are less than 10% dependent on thermal coal (based on % EBITDA at group level).

After our coal-dependent client review during 2020, four clients across our portfolio were identified as 100 per cent dependent on thermal coal. We have ceased new business with all four clients and are exiting these relationships subject to any outstanding contractual arrangements.

We are committed to engaging with all business clients to understand how they are participating in the low carbon transition and supporting them to improve their performance over time. Where this is not possible, transactions have been, and will continue to be, turned down.

In 2020, we began work which will create Transition Frameworks for eight of the most carbon intensive sectors within our portfolio, with the dual objective to reduce our financed emissions as well as support industries through transition finance opportunities.

During 2020, we established access to extensive data sources and methodologies to analyse the emissions profile and temperature alignment of our corporate clients. Further detail on this can be found on page 35 of this report. While more work remains to be done in this area, early results of this covering a sample of 100 corporate clients are provided in Figure 58 on page 71.

In response to the Bank of England's climate risk supervisory requirements and the upcoming 2021 BES, we are undertaking a large-scale outreach to approximately 2,000 top corporate clients, covering 80 per cent of our corporate net nominal exposure. Some initial insights from this work are included in the Metrics and Targets section for Credit Risk and CCIB, and further updates will be provided in due course.

C. Managing the financial risk from climate change



While transitioning to a net zero economy creates plenty of opportunity, with it comes risk. But before we can manage the risk, first we must size it.

We acknowledge that the uncertainties surrounding the manifestation of physical and transition risk mean that no tool or methodology is perfect. However, given the urgency of climate change we are moving quickly – exploring methodologies, running pilots and setting out the processes to integrate climate risk into mainstream risk management activities.

Climate risk was incorporated into our central ERMF in 2020, where it is designated as a material cross-cutting risk. As the risks from climate change manifest through existing risk types – for example, the creditworthiness of our clients or the operational viability of our office buildings, we have considered the materiality of climate risk against each of our 11 principal risks. Seven PRTs were determined to be most impacted by climate risk – details on the risks identified and processes used to do this can be found in the Risk section on pages 40 to 63.

We have developed a holistic toolkit to quantitatively measure climate-related physical and transition risk which included reviewing a wide range of proposals from FinTechs, consultancies, NGOs and academics offering a range of tools, methodologies and approaches. As a result, in 2020 we formed a partnership with Imperial College London who act as our academic advisors for climate risk. We also invested in physical and transition risk tools as a first step towards building our capabilities to measure climate risk. An overview of our toolkit is presented from page 30. Some initial results are disclosed in this report to illustrate our early steps in beginning to quantify the impact of climate risk. We fully intend to develop and mature our coverage and application of climate risk assessment over 2021 and beyond.

In our strategic business planning, we consider 'short term' to be less than two years, 'medium term' to be two to five years, and 'long term' to be beyond this. Parts of our climate risk assessments use an outer time horizon of up to 2050 for transition risk and up to 2100 for physical risk. For more details on how we apply scenario analyses and consider time horizons please see pages 24 to 27.

Assessing our resilience

Overview

We have progressively strengthened our scenario analysis capabilities – moving from top-down, narrative-based scenarios to bottom-up, quantitative and granular scenarios which are data and modelling-driven. As such, consequent consideration of such scenario analysis in business strategy and financial planning is also being progressively strengthened. In 2020, we completed a qualitative review of the corporate plan against top-down climate risks and made progress on more granular bottom-up scenario analysis. Our next phase of work will include consideration of the quantitative climate risk insights in the business planning process.

Through this report, we have provided initial results on granular data-led scenario analysis of 100 corporate clients, covering approximately 10 per cent of our corporate exposure across a range of sectors. In 2021, we plan to scale up this granular analysis to cover 80 per cent of our corporate exposure, and potentially extend to other asset classes.

Scenario analysis

In order to assess climate-related risks and opportunities in the short, medium and long term, we use scenario analysis to consider how risks and opportunities may evolve under different situations. We worked to significantly enhance our scenario capabilities over the course of 2020 in order to begin integrating their use into our businesses, strategy and financial planning.

An introduction to climate risk scenarios and an overview of various scenarios, published by governmental and academic bodies, that have informed the development of our own tailored scenarios is set out in Appendix 2.

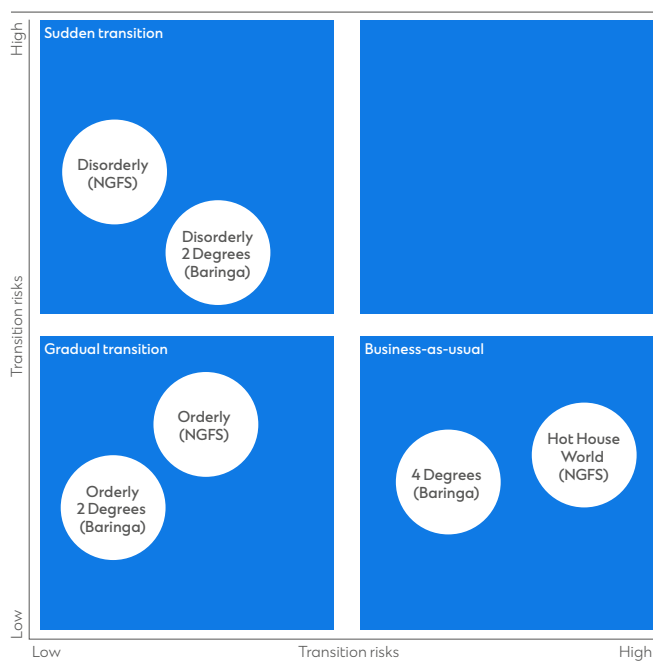
Earlier initial scenario industry pilots

Between 2017 and 2018, we participated in a UNEP-FI pilot to develop tools to assess transition¹ risks to a range of sectors including oil and gas and mining, and physical² risks in areas including agriculture and commercial real estate.

Since 2018, we have worked with the 2 Degrees Investing Initiative (2DII) to pilot their Paris Agreement Capital Transition Assessment (PACTA) tool, both individually and in collaboration with several other banks as part of the 'Katowice Commitment'. We shared our experience in piloting PACTA in our May 2019 'Emissions White Paper'³, followed by initial results as applied to our cement and automotive portfolios in our December 2019 TCFD report⁴. Here, we communicated our intent to perform granular scenario analysis using the framework provided by the Network for Greening the Financial System (NGFS).

Throughout 2020, we have significantly progressed our scenario analysis capabilities in collaboration with Baringa for transition risk and Munich Re for physical risk, as described in the following sections.

Figure 12: Standard Chartered transition scenarios developed with Baringa



¹ <http://www.unepfi.org/wordpress/wp-content/uploads/2018/04/EXTENDING-OUR-HORIZONS.pdf>

² <http://www.unepfi.org/wordpress/wp-content/uploads/2018/07/NAVIGATING-A-NEW-CLIMATE.pdf>

³ <https://av.sc.com/corp-en/content/docs/emissions-whitepaper.pdf>

⁴ <https://av.sc.com/corp-en/content/docs/Standard-Chartered-Climate-Change-Disclosures-2019.pdf>

Transition risk scenarios at Standard Chartered

We use Baringa's scenario model to assess the climate transition risk for our corporate and institutional clients. These scenarios benefit from extensive coverage relevant to the financial services industry and cover all our key client industry sectors and asset classes at a global scale, enabling us to analyse a large proportion of our diverse and international asset base.

Results of this scenario analysis are provided in the Metrics and Targets section in Figure 61 on page 74. We intend to further develop these tools for use in transactional and client risk assessments, stress testing and quantitative insights for corporate planning. To derive meaningful insights from the outputs of scenario analysis, it is important to understand the underlying methodologies and be aware of key assumptions and limitations. These are summarised below.

Three key scenarios

These three climate scenarios act as the foundation onto which we will tailor our own scenarios for assessing client transition risk and quantifying temperature alignment. Each scenario has a number of key parameters. Refer to Appendix 2 for how our scenarios benchmark against well-known transition scenarios including IEA, IPCC and the Climate Action Tracker.

Key scenario parameters informing the scenario assumptions we apply

The scenarios described below have been applied to our own properties, clients and portfolios to produce the result shown in Figures 14, 15 and 16.

Carbon price In our Orderly 2 Degrees scenario, the global carbon price rises progressively to between USD300 and USD400/tCO₂-eq by 2050 as the transition progresses. By contrast, in our Disorderly 2 Degrees scenario, the global carbon price is very low throughout the 2030s, and then rises steeply in line with the extreme decarbonisation effort required in the late 2030s onwards.

Figure 14: Global carbon price in our transition risk scenario

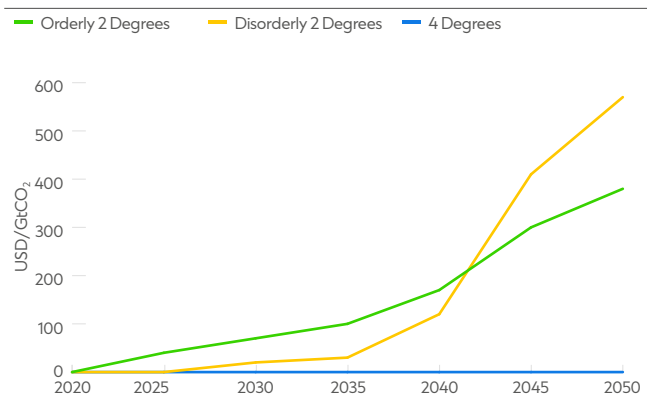
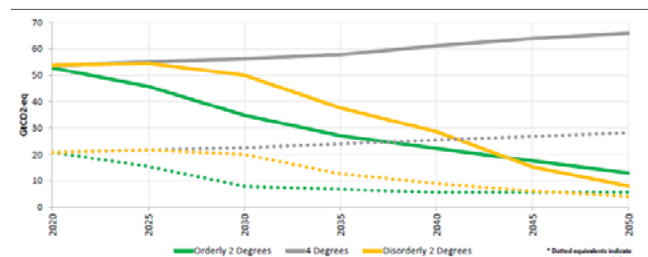


Figure 13: High-level narrative of transition scenarios currently in use in Standard Chartered

Transition scenarios	High-level assumptions	Time horizon
4 Degrees	Assumes that the world does not respond to climate change at all and technology deployment is driven purely by relative economics. This scenario features: no carbon pricing, continued thermal power generation (especially in developing markets), some renewable capacity expansion, and some electrification of transport. This scenario implies greater physical risks, largely manifesting after 2050.	Up to 2050
Disorderly 2 Degrees	Assumes the world does not respond to climate change before 2030, and then takes sharper corrective actions to limit global warming impacts, resulting in high transition risks. This scenario features a global carbon price (Figure 14), major expansion of renewables, electrification of heat, transport, and industry, and development of carbon capture and storage.	Up to 2050
Orderly 2 Degrees	Assumes a globally coordinated response to climate change sees the world quickly decarbonise in an orderly and efficient manner, therefore limiting transition risks. This scenario features: a global carbon price (Figure 14), major expansion of renewables, electrification of heat, transport and industry, and development of carbon capture and storage.	Up to 2050

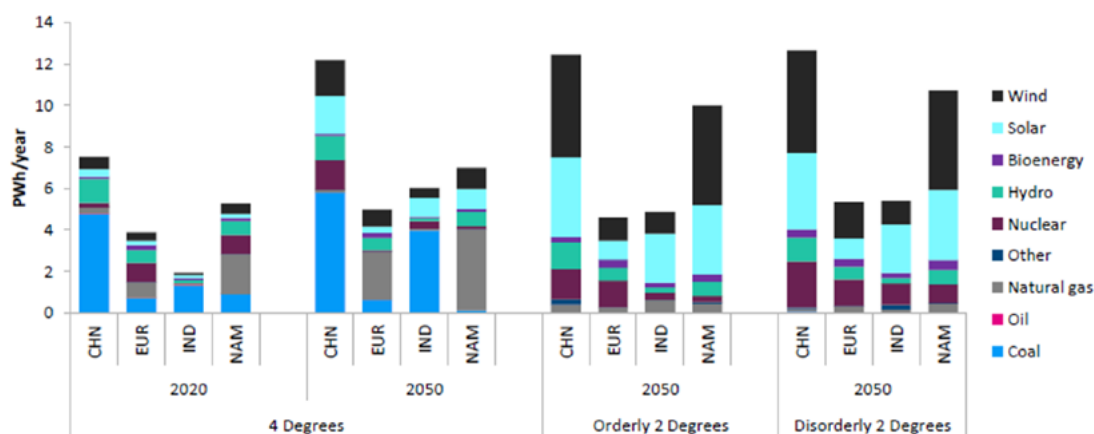
Greenhouse gas (GHG) emissions follow significantly different trajectories in our three scenarios. In our 4 Degrees scenario, global emissions continue increasing steadily to 2050, leading to major rises in physical risks. Our Orderly and Disorderly 2 Degrees scenarios are both aligned with the Paris Agreement targets to limit global temperature increase to within two degrees by 2100.

Figure 15: Greenhouse gas emissions trajectory in our transition scenarios



Sectoral emissions All sectors will need to significantly reduce their GHG emissions, but only some will become fully carbon neutral by 2050, with negative emissions used to offset some residual emissions. The power sector is already undergoing a shift to low-carbon in some markets as renewables start to become cost competitive with other technologies. Decarbonisation of power is substantial in both 2 Degrees scenarios, with net sector emissions becoming negative due to the use of Bioenergy with Carbon Capture and Storage (BECCS). The deployment rates assumed in the scenarios for various technology types are based on optimising the associated cost to achieve the emissions targets. We recognise the need to run further sensitivity analysis under different scenarios (e.g. exploring a scenario where BECCS does not become a scalable solution).

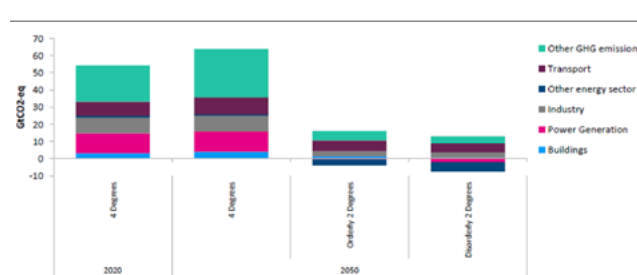
Figure 17: Regional power generation by fuel type



Limitations and further work

Working with Baringa, we have selected scenario assumptions that reflect Standard Chartered's own operating model, asset base and geographic spread. We continue to advance our experience of integrated climate scenarios (including through regulatory stress tests in 2021). We plan to apply more bespoke assumptions and further refine the tools; for example, by breaking down some global regions into countries, and also design new scenarios such as 1.5°C scenarios reflecting pathways to net zero emissions by 2050 as part of our 2021 commitment to align to net zero.

Figure 16: GHG emissions by sector



Regional power generation Power sector decarbonisation is not uniform across all regions in our scenarios, reflective of market conditions and regional nuances. A significant expansion in renewables is expected across key regions in the 2 Degrees scenarios. Growth in electricity demand in China (CHN), India (IND) and other developing economies by 2050 is expected to dwarf that of developed economies. In the 4 Degrees scenario fossil use is split substantially between regions with access to cheaper coal supply (Asia) and those with better access to natural gas such as North America (NAM) and Europe (EUR).

Current results from these tools are based on our top 100 corporate clients. In 2021 and beyond, we aim to expand the coverage of our scenario analysis to more clients and asset classes, and also develop capabilities to run sensitivity analysis against key scenario assumptions. These advancements in scenario analysis will more comprehensively inform our business planning.

We welcome the NGFS efforts to provide standardised climate scenarios which will help drive comparability of results across institutions. We are closely following the NGFS developments, and as more granular data becomes available over 2021, we plan to conduct similar scenario analysis using the NGFS scenarios to our stress testing and BAU risk assessments.

Transition risk scenario analysis results

Our transition risk scenarios are applied at an individual company level, leveraging Baringa's company impact models. We were able to include our top 100 corporate clients in this analysis, covering c. 10 per cent of our corporate exposure. It is important to note that these are gross risk results and do not take into account differentiated levels of transition plans for different corporates.

Under both the orderly and disorderly transition scenarios, we generally see probability of default (PD) worsen over time as the objective here is to isolate the impact of transition through changing demand and production constraints, and carbon taxes progressively increasing over time. Under an orderly transition, most material impacts are experienced after 2040, as carbon price crosses the \$200 threshold. Among the sectors and clients that we analysed, Energy and Cement production were found to be most materially impacted on an average.

Under a disorderly transition, the PDs start to peak later than in the orderly transition scenario, which is intuitive as carbon price sets in later in the scenario (around 2035). However, as carbon price rises sharply to meet the overall emissions constraints, impact to PD appears to be significantly more severe towards the end of the scenario (2045–2050) when carbon prices cross the \$400 threshold.

For detailed results, refer to the Metrics and Targets section.

Physical risk scenarios at Standard Chartered

Our physical risk tool, provided by Munich Re's NATHAN, uses standardised scenarios and set time horizons to assess future risk from acute and chronic physical risks. The forward-looking risk indices are derived based on the Representative Concentration Pathways (RCP) scenarios published by the Intergovernmental Panel on Climate Change (IPCC). Given the academic challenges with forward-looking physical risk scenarios it is not possible at this point to customise these as we have done for transition risk scenarios.

Qualitative review of climate risks and opportunities in the annual Business Strategy and Financial Planning process

In 2020, climate risk was considered as part of our formal annual corporate strategy and financial planning process. Regional and client-segment CEOs carried out a qualitative assessment of their corporate plans against climate risk guidelines issued by the Group. We intend to use our new tools for quantitative scenario analysis in 2021 and future years.

This assessment focused on revenue reliance from clients in high-carbon sectors and/or located in regions most exposed to physical risk, considering adequacy of mitigation plans. This was then independently reviewed by regional and client-segment CROs and the Climate Risk team, and included in the Group CRO's review of our corporate plan, which was considered by the Board as part of its approval of the overall corporate plan.

In most cases, the physical and transition risks identified were assessed to be well controlled in the short term. The Group is not actively targeting growth in most of the high-carbon sectors (many of which are identified as vulnerable sectors as a result of COVID-19 and are being actively managed from a credit risk perspective)⁵, and is instead prioritising sustainable finance products to clients in high-carbon sectors to decarbonise their business models. Growth ambition is shifting to lower-carbon sectors such as clean technology. The Group's sustainable finance priorities including innovative products such as sustainable deposits, carbon trading and ESG advisory, and dedicated transition frameworks are a robust response to transition risks in the short term, strengthening our strategy's resilience towards a 2°C or lower transition scenario. However, longer-term transition risks were highlighted particularly for the Africa & Middle East (AME) region, given its dependency on fossil fuels; and longer-term physical risks were deemed to be most relevant for the ASEAN & South Asia (ASA) region.

These insights have helped the continued development and growth of our Sustainable Finance capabilities, including the prioritisation of work on sector-specific client transition frameworks which will be released during 2021 to play a role in supporting us to manage climate risks associated with key sectors and clients, and in aiding clients to understand and take action in the climate transition. This will also aid in the identification and capture of climate-related opportunities.

The corporate planning process takes place annually, reflecting market conditions and the Group's priorities. Quantitative insights gained from scenario analysis will be considered as part of 2021's corporate planning process. Embedding climate risk into mainstream risk processes (see Risk section) and the Group's emerging quantitative scenario analysis capabilities will continue to inform and strengthen how we adapt our business strategy and financial planning to address potential climate risks and opportunities as these evolve.

⁵ Refer to [annual report](#) page 220

Figure 18: Forward-looking physical risks, scenarios and time horizons used in our physical risk assessments

NATHAN climate hazard indices		Description of current and projected climate hazard scores	RCP scenario	Time horizons
Acute	Tropical Cyclone (TC)	Tropical Cyclone zones	4.5, 8.5*	2050, 2100
	River Flood	River Flood zones	4.5, 8.5	2050, 2100
Chronic	Sea-Level Rise	Sea-Level Rise zones	2.6, 4.5, 8.5	2100
	Heat Stress	Heat Stress Index based on range of high-temperature indicators	2.6, 4.5, 8.5	2050, 2100
	Precipitation Stress	Precipitation Stress Index based on heavy-precipitation indicators	2.6, 4.5, 8.5	2050, 2100
	Fire Weather Stress	Climatological index for wildfire hazard	2.6, 4.5, 8.5	2050, 2100
	Drought Stress	Drought Stress Index based on Standardised Precipitation-Evapotranspiration Index (SPEI)	2.6, 4.5, 8.5	2050, 2100

* TC for RCP8.5, 2050 based on RCP4.5, 2100 modelling; TC for RCP8.5, 2100 not available yet

3.

Introduction

1. Governance

2. Strategy

3. Climate risk toolkit

4. Risk

5. Metrics and Targets

6. Appendices



Climate risk toolkit

30	Climate risk toolkit
30	Investing in risk quantification – our toolkit and partnerships
30	Physical risk
35	Transition risk and temperature alignment
35	Additional climate data
36	Academic advisors – Imperial College London

Climate risk toolkit

Investing in risk quantification – our toolkit and partnerships

In 2020, we made significant investments in climate risk management tools and partnerships. The following section explores these and offers an insight into how these are applied to our portfolios and operations.

The key objectives of the tools and partnerships we have invested in are to:

- ensure our employees – including Relationship Managers, risk officers and property teams, are equipped with user friendly tools to assess climate risks and business impacts
- gain access to industry leading approaches and the latest tools as they unfold
- access top academic insights to help solve climate-related business challenges

In addition to these key partnerships, we also use a range of other tools and data sources, such as Snowdrop Solutions, (for geocoding collateral or asset locations), Carbon Disclosure Project (CDP), 2 Degrees Investing Initiative (2DII) and the Transition Pathway Initiative (TPI).

At the time of writing, these tools are undergoing our independent model validation process. Owing to the development and use of climate risk tools for use in the financial sector being at a very early stage across the industry, we fully expect to refine and develop our approach as best practice emerges. However, we are sharing some preliminary results from our tools to provide transparency to our stakeholders, and to aid further development among peers. Throughout 2021, these results will be increasingly integrated into mainstream risk reporting, enabling senior management and risk committees to exercise robust oversight on the quantitative climate risk profile.

Physical risk

Leveraging the insurance sector's long history in managing risk from natural hazards, we use Munich Re's Natural Hazards Assessment Network (NATHAN) physical risk assessment tool, already used as an input to some insurance and re-insurance premium pricing across the industry. Informed by natural catastrophe and climate change modelling, the tool provides standardised risk and hazard coverage across the globe which was a critical requirement given our international footprint.

The physical risk identification considers the risk and hazard for chronic and acute climate events by location at present day, and in the future (2050, 2100) under different temperature scenarios (RCP 2.6, 4.5, 8.5). The results are informed by a complex network of underlying natural catastrophe and climate models.

Figure 19: Overview of our Climate Risk toolkit and partnerships



Risk severities underlying individual hazards

In order to interpret the results accurately, it is important to understand the underlying granularity in risk severities and that property information such as building adaptations are not factored in, nor is the hazard score showing the impact on asset value. Figure 22 includes some of the key hazards in this regard. As we found when assessing our own portfolios, the definition of extreme is quite conservative in the assessment scale. For example, a location exposed to 100-year return period for floods, i.e. only one per cent annual chance of flooding, will be classified as extreme.

Figure 22: Examples of hazard severities

Tropical Cyclone Zone 0: 76-141 km/h Zone 1: 142-184 km/h Zone 2: 185-212 km/h Zone 3: 213-251 km/h Zone 4: 252-299 km/h Zone 4: ≥300 km/h Probable maximum intensity with an exceedance probability of 10% in 10 years (equivalent to 'return period' of 100 years).	Tropical Cyclone – the degree of exposure is represented by a five-level scale based on the Saffir-Simpson scale and the main variables of the exposure analysis are:	
	• forward wind	
	• maximum wind speed	
	• maximum central pressure	
	• radius of maximum wind speeds	
	• track of the centre ('eye') in 3-6 hourly intervals (in exceptional cases, 12-hourly intervals)	
River Flood 0 500 100 Areas threatened by extreme floods. JBA flood maps with return periods of 100 and 500 years.	River Flood risk is based on return periods and classified into three zones, ranging from Zone 0 (areas of minimal flood risk) to 100 (100-year return period of river flood). The river flood map covers the whole world and does not consider dams.	
	Flood zone	Description
	Zone 0	Areas outside the 0.2% annual chance floodplain
	Zone 100	1% annual chance flood event (100-year return period)
	Zone 500	0.2% annual chance flood event (500-year return period)
Storm Surge No hazard Zone 1,000 year return period Zone 500 year return period Zone 100 year return period Detailed calculation for coasts and shores of large lakes. Zones based on 30m ALOS Digital Elevation Model (DEM), taking into account wind speed and bathymetry (underwater depth of lake or ocean floors).	Storm Surge is classified into three categories: zones 100, 500, 1,000	
	• Coasts in Zone 100 are exposed to a 100-year return period of storm surge (1% annual flood chance)	
	• Coasts in Zone 500 have a 500-year return period (0.2% annual flood chance)	
	• Those in Zone 1,000 have a 1,000 year return period (0.1% annual flood chance)	

Forward-looking physical risk assessment

We can analyse the current risks at our own locations or those of clients based on historical climate event data and analyse future climate-related risks based on the Representative Concentration Pathways (RCP) scenarios published by the Intergovernmental Panel on Climate Change (IPCC). For example, sea-level rise can affect coastal regions worldwide and regions will experience varying impacts based on their topography (particularly elevation profile) and adaptation measures. A view of sea-level rise for United States East Coast for RCP 8.5 at 2100 is shown below, the darker the shade of amber, the higher the sea level risk.

Figure 23: Projected sea-level rise around New York area, under RCP 8.5 at 2100



Limitations and further work

A major limitation is that adaptation plans for a building or asset, for example flood defences, are not currently captured in the risk assessments as this data does not exist in a format that we can easily overlay. In time we hope that the quality of such industry-held data improves globally, including geospatial insights.

In some cases, as the risk severities are defined on a standardised global scale, variations within a particular region are not clearly captured. For example, most of Hong Kong qualifies as extreme storm risk, leading to a lack of differentiation between properties at the more severe end of storm risks and those relatively more benign. We will work with Munich Re to explore further risk differentiation in such cases.

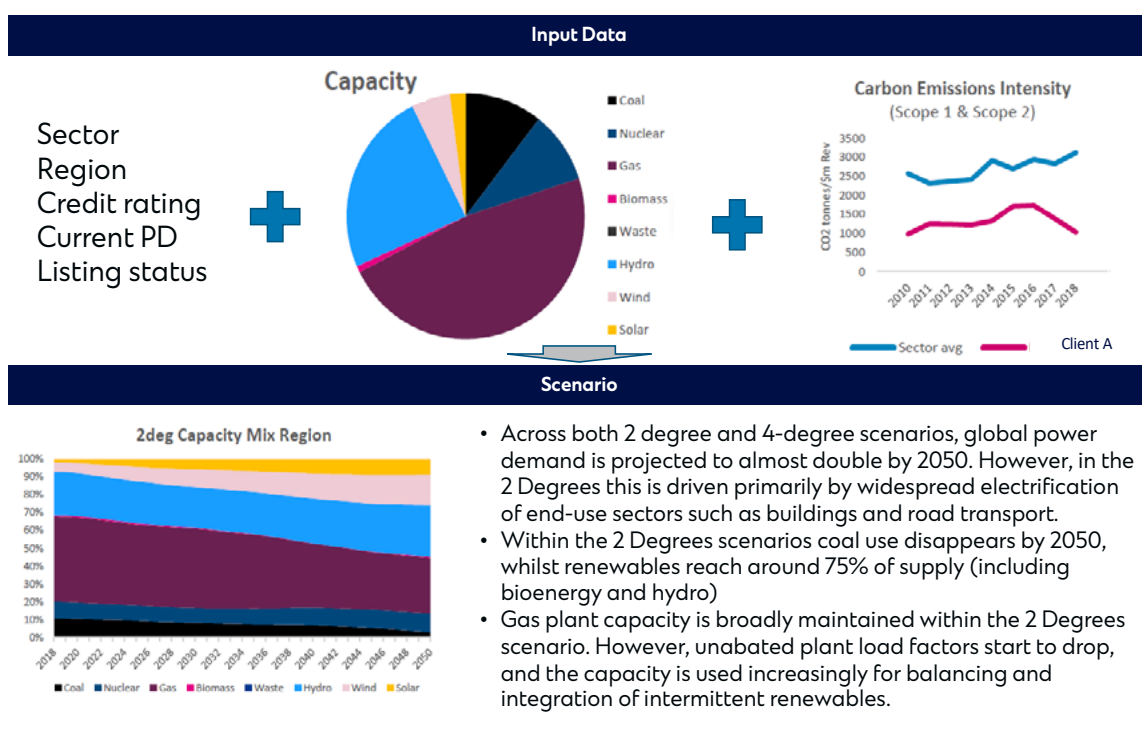
Given the scientific uncertainty in climate modelling, the current forward-looking projections are only provided at 2050 and 2100. As climate science advances, there is further room for improvement in the robustness of forward-looking risk assessments. We'd encourage the development of more frequent time periods, for example every 10 years, or as with our transition risk tool the ability to specify the time period.

We are mindful of the difference in use cases between the insurance and banking sector, to treat the conservatism in risk scores appropriately, and to consider that the scores show the gross potential risk; for example, a storm causing minor damage to a building might lead to insurance claims, but not materially deteriorate property valuation. These are issues we initially encountered in our work on the UNEP-FI TCFD pilot in 2017.

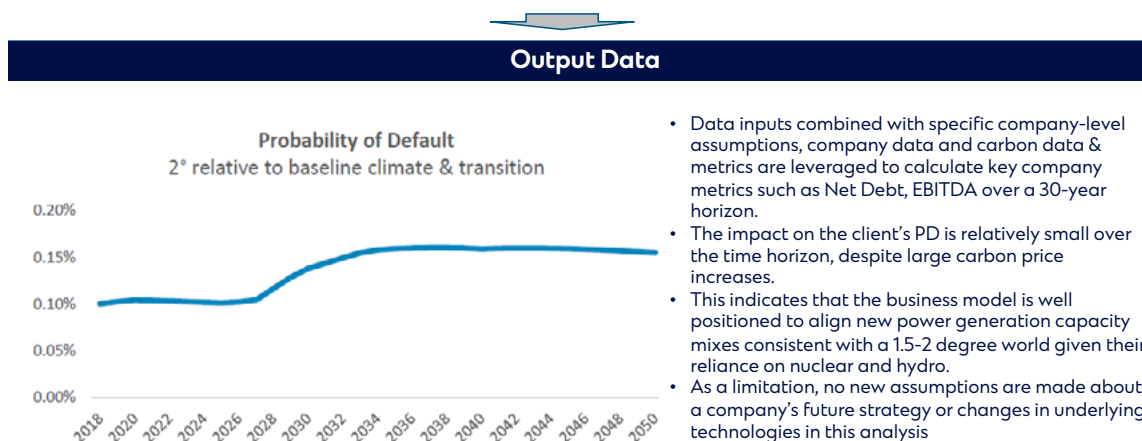
Case study 4

How climate scenarios translate into company-level impact

The client in this case study is a European electric utility company which uses a diverse set of technologies and fuel sources to generate power. Chart below shows its capacity mix by fuel types relative to the power sector's average capacity mix. This client has less reliance on coal than the sector average and has maintained a lower than average emission intensity. We then apply the scenario assumptions relevant for this client (capacity mix for European utilities sector).



Application of the scenario then leads to projected probability of default (PD) migration over a 30-year period. The PD in this case remains quite stable in an orderly transition, as the company has a better emissions profile than sector and regional benchmarks. Note that any actions the client might take to reduce reliance on coal fired power generation further is not factored into the PD simulation.



What is temperature alignment and why do we use it?

Temperature alignment is a way of quantitatively assessing a company's impact on the climate and is calculated based on emissions intensities, and volume of hydrocarbon produced. It maps the company's forward-looking carbon intensity and hydrocarbon production outlook (where applicable) against a temperature score. For details on the calculation methodology see Appendix 3.

The temperature alignment measure recognises that under an efficient Paris-aligned decarbonisation trajectory, different industries and regions should decarbonise at different rates. By capturing the climate impact of investments, temperature alignment facilitates the flow of capital to companies that are aligned with the Paris Agreement. In theory, this provides aligned firms with a competitive financing advantage, which may enable them to capture market share, increasing the likelihood that emissions fall to target levels. Our temperature alignment approach also allows for facilitating the flow of capital to best performers within sub-industries, which means capital can be directed to facilitate transition to the clients and sectors which need it the most (even traditionally high carbon sectors), and are making positive steps to decarbonise. We recognise however, that there are a range of assumptions and approaches to calculate temperature alignment, and we fully expect to refine our approach as more market-leading and consistent methodologies emerge.

The charts here demonstrate that a 2°C transition pathway is likely to be different between regions. The UK and Ireland region on average has a lower starting position in terms of emissions intensity compared to India, and therefore follows a different trajectory of decarbonisation over the next 30 years. The application of these decarbonisation pathways on company A and B (both power companies in India) shows how the temperature alignment metric differentiates within the same region, based on relative emissions levels – company B is assigned 1.5° as its emission profile is consistent with a 1.5° decarbonisation pathway for India. The approach also incorporates the differences in regional decarbonisation pathways, so a utility company in the UK with a similar emissions profile as company B will be assigned a higher temperature alignment rating.

Figure 24: CO₂ emission intensity from power sector for 4 Degrees and 2 Degrees scenarios from our transition model

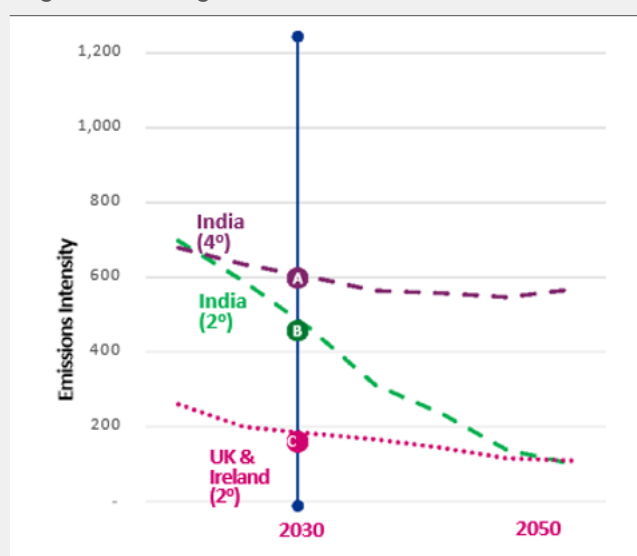
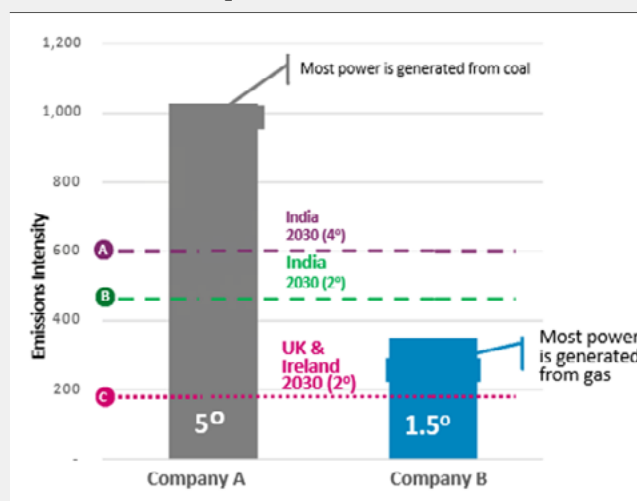


Figure 25: Carbon intensity of power generation using reported Scope 1 CO₂ emissions and power generated



Transition risk and temperature alignment

Baringa's climate change scenario model provides transition risk assessments and temperature alignment data for assets across the world. The scenarios and models are configurable to our own portfolio and can provide a granular analysis of our individual companies' transition and adaptation strategies, in the context of global transition scenarios and the parameters previously described. This means we can assess clients in different sectors and form a view on their current status and plan future commitments to mitigate associated risks. The outputs can also provide a platform for client engagement. Results are informed by a complex network of underlying integrated assessment and cashflow models.

Transition risk assessment – model methodology and how we apply it

By mapping each individual client to their relevant sub-sectors and considering the technologies they rely on, through the model we can translate the detailed scenario variables into projected impact of transition to income statements, and consequent impact to PD, as shown in Figure 61 on page 74.

Temperature alignment

Temperature alignment is a metric to measure climate alignment in terms of degrees of warming at an individual company level, using data and analytics that are consistent with the risk calculations.

Limitations and further work

Financial projections over 30 years are inherently challenging due to the uncertainties associated with many of the drivers of transition risk; for example, introduction of scalable breakthrough technologies, or geopolitical changes influencing speed of governmental policy changes can rapidly change the risk profile. It is also difficult to predict with certainty the management actions companies or banks might take over a long time horizon. As such, while we have the capability in theory to adjust client-level outputs using assumptions on the actions clients may take, we have so far focused on assessing the gross risk without the added uncertainty on client actions. Therefore, results described in this document are not our views on what is likely to happen in the future and should be interpreted as sensitivity analysis on what might happen under various scenarios.

With time, we aim to expand the coverage of sector-specific detailed methodologies for transition risk and temperature alignment estimates (see Appendix 3) which will improve the specificity of the transition risk assessments and temperature alignment calculation.

Additional climate data

S&P Market Intelligence data, including S&P's Trucost, provide us with a variety of emissions and asset-location related data to inform our client climate risk assessments. Through this partnership, we have access to a universe of more than 16,000 companies covering absolute emissions (tonnes of CO₂e) and emissions intensities by revenue (tonnes of CO₂e/USD million) for Scope 1, 2 and 3 emissions where available.

We chose this data source as it provides extensive data coverage across all sectors instead of being constrained to only high carbon sectors, coverage across our client base, and accuracy of data (majority of data based on company disclosures, enabling smoother client engagement and drive the need for more disclosures).

Company-level carbon data

Trucost's company-level carbon data comes either directly from company disclosures, for example, from annual reports, sustainability reports or CDP responses, or estimated using other data sources by Trucost's experts. For our top 2,000 client entities as at December 2020, we found above 1,400 matches with S&P data either at an entity or client group level, of which approximately 50 per cent information was based directly on client disclosures and the other half estimated.

Company-level asset location data

We also source granular asset location data for our corporate clients from S&P Trucost, which provides asset type and precise latitude and longitude for a range of assets for each company.

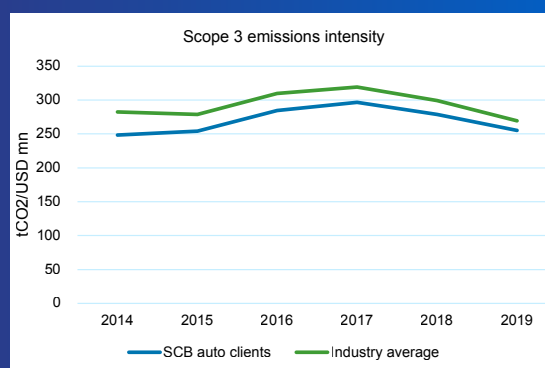
Limitations and further work

S&P Trucost is working to periodically update the recency (e.g. emissions data) and volume of data (e.g. asset locations) in its database. As company-level disclosures improve, we expect the S&P Trucost database to evolve to cover more data and companies, particularly for unlisted companies and at a legal entity level, which will improve the accuracy of our transition risk assessment.

Also, given the amount of data spread across different modules in S&P, it will be a powerful enhancement to bring different elements of the data in one place, making it more user friendly for data analysts.

Case study 5

Example of emissions assessment for our automobile portfolio using S&P Trucost data



We see that for our automobile portfolio for scope 3 emissions (including tailpipe emissions) that the emissions intensity is lower than the industry average. Such emissions intensity information at a client level is provided as inputs to our transition risk and temperature alignment methodology.

Academic advisory – Imperial College London

Financial institutions have had to consider the forward-looking risks from climate change relatively recently, whereas scientists and academic institutions have been focused on the disruptive impact of global warming from industrial processes for many years. So, it made sense to look to the scientists for support in unlocking some of the most complex practical challenges to climate risk management, and to bridge the gap that existing market solutions cannot yet solve. In February 2020, we invested in a four-year partnership with Imperial College London, to uncover solutions that will help embed climate risk identification and management into financial decisions. We draw upon Imperial for help in three areas:

- 1) Long-term research on climate risk that may benefit the industry as we move forward together on climate risk.
- 2) Advisory on shorter-term internally focused challenges related to climate risk.
- 3) Training and education of our staff and Management Team to raise awareness and understanding of climate risk.

“We are very pleased to be working with Standard Chartered, one of world’s largest emerging markets banks and a demonstrated leader on the issue of sustainability. This partnership will enable an important expansion of Imperial’s efforts to help define a way forward for major financial institutions and corporations on climate risk management. Standard Chartered’s support is a testament to not only the bank’s commitment in this area, but also the pace and scale of the challenges ahead.”

Dr Charles Donovan

Executive Director of the Centre for Climate Finance and Investment at Imperial College Business School



Case Study 6:

Research

The first public research output to come from our Imperial partnership looked at energy transition scenarios and the impact of declining coal use in India. The research, undertaken by Imperial College London, coupled scenario analysis with firm-level financial modelling to explore potential impairments for three major players in India's coal value chain.

The results showed free cashflow at risk (CFaR) for these companies of at least USD9 billion over the next decade, with impacts on CFaR from the changes captured in the Aspirational scenario. This research supports industry knowledge in scenario analysis and to stimulate investors and policymakers to consider actions that may help mitigate unanticipated outcomes as India and the world accelerate a shift from fossil fuels to renewable power.



Read the report or watch the launch event discussion here
<https://www.imperial.ac.uk/business-school/faculty-research/research-centres/centre-climate-finance-investment/research/energy-transition-coal-solar-and-indias-next-decade/>

Energy in transition:
coal, solar, and India's
next decade

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4.

Introduction

1. Governance

2. Strategy

3. Climate risk toolkit

4. Risk

5. Metrics and Targets

6. Appendices

! Risk

40	Risk
40	Risk definition and taxonomy
40	Overview of risk management processes
41	Climate Risk Appetite Statement
41	Embedding climate risk as a material cross-cutting risk
43	Credit risk
43	Corporate, Commercial and Institutional Banking (CCIB)
49	Consumer, Private and Business Banking (CPBB)
52	Operational risk
55	Country risk
60	Reputational risk
61	Compliance risk
63	Traded risk
63	Capital and liquidity risk

Risk

Risk definition and taxonomy

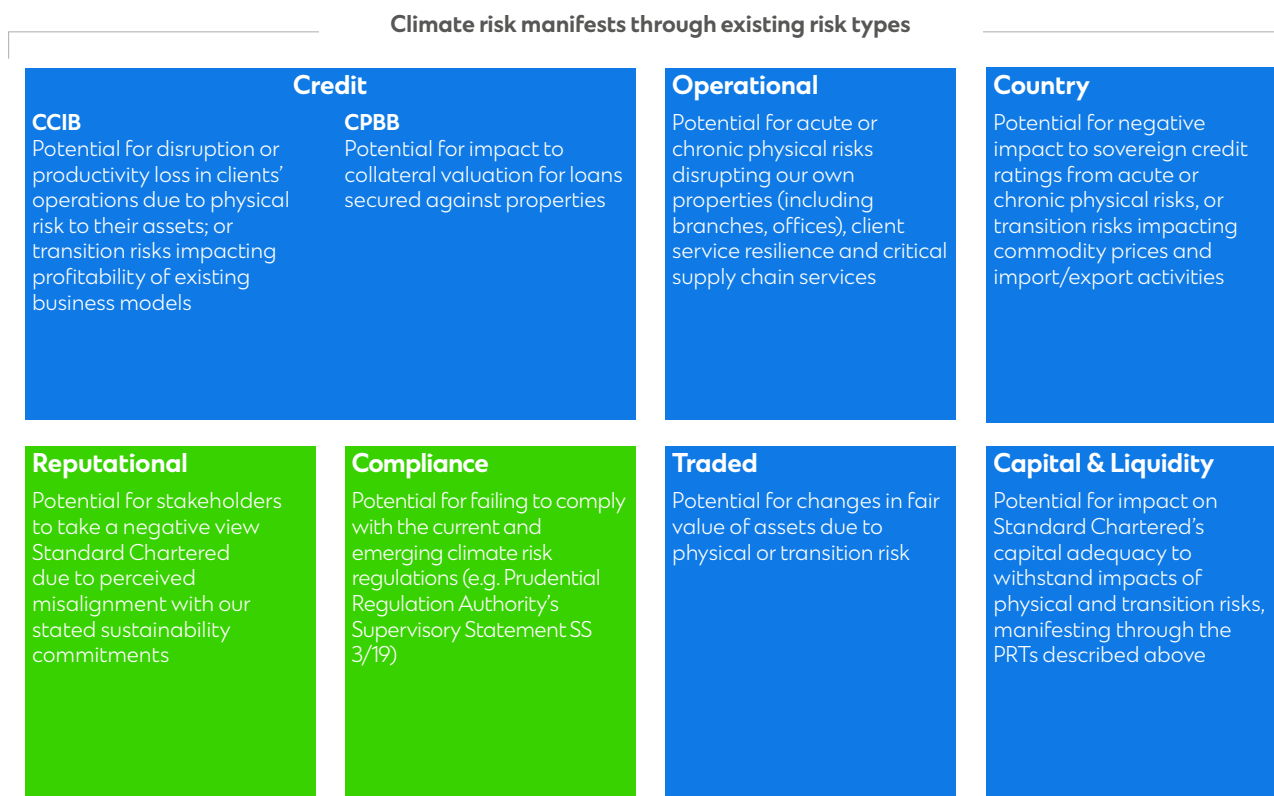
In 2020, climate risk was incorporated in our Group-wide risk taxonomy through the Enterprise Risk Management Framework (ERMF)⁶. Climate risk is formally defined within the ERMF as “the potential for financial loss and non-financial detriments arising from climate change and society’s response to it” and as a “material cross-cutting” risk, as it manifests through impacted Principal Risk Types (PRT) or overarching risk types. Principal risks are those risks that are inherent in our strategy and business model and are also formally defined in the ERMF. Seven principal risks are deemed to be most materially impacted by potential climate risk outcomes.

Overview of risk management processes

The processes we are developing for identifying, assessing and managing climate-related physical and transition risks could be summarised through two inter-connected lenses:

- Top-down/vertical – As is the case with other mainstream risk types, the Board has set a Risk Appetite Statement for climate risk, which will be cascaded down through the organisation, supported by various risk metrics.
- Cross-cutting/horizontal – Given the unique cross-cutting nature of climate risk, we have taken the approach of developing granular risk-type specific plans for integrating climate risk across the mainstream risk types. In order to support this integration, we have analysed the following for each of the impacted PRTs – transmission channels (i.e. how climate risk impacts the PRT), existing inherent controls in place to mitigate the climate risk impact, and additional climate risk-specific activities needed to measure and manage the identified risks. While being risk-type specific, we have retained a consistency of approach through the central Climate Risk team’s oversight and application of the standard toolkit which we have developed with our external partners.

Figure 26: Climate risk as a material cross-cutting risk



Principal Risk Types: — financial — non-financial

⁶ To find out more about our Principal Risks and wider risk management please see pages 248 to 269 in the [2020 Annual Report](#)

In 2020, we focused on building a granular set of metrics across the impacted PRTs. While many of these are still work in progress or need to be expanded in terms of coverage, we provide details of these throughout this Risk section, with a summarised view in the Metrics and Targets section. Moving forwards, we will focus on integrating the relevant metrics into mainstream reporting and decision-making processes including defining materiality-based risk acceptance authorities between first and second lines of defence, and setting target thresholds as relevant for monitoring the risk levels.

Climate Risk Appetite Statement

Within the context of relevant business, risk appetite is defined and approved based on a range of considerations by different risk types which inform our overall approach to risk management and risk culture, including regulatory minimum requirements and additional internal requirements built on top of these regulatory minimum requirements.

We set our risk appetite to enable us to grow sustainably and to avoid shocks to earnings or our general financial health, and to manage our reputational risk so that it would not materially undermine the confidence of our investors and all internal and external stakeholders.

Our Climate Risk Appetite Statement (RAS) is approved by the Board annually and follows the principle of ‘double materiality’, i.e. it considers both our contribution to climate change (strategic) and the risks arising from climate change (prudential). The RAS will be supported by a strategic risk appetite metric based on potential losses under different climate scenarios, and various underlying management reporting metrics based on risk concentration. We will begin reporting on this in 2022 after conducting extensive stress tests over 2021. In the interim, we have provided prototypes of various management reporting metrics, which will be integrated into mainstream risk reporting over 2021.










Climate Risk Appetite Statement, approved by the Board:

“The Group aims to measure and manage financial and non-financial risks from climate change, and reduce the emissions related to our own activities and those related to the financing of clients in alignment with the Paris Agreement.”

Embedding climate risk as a material cross-cutting risk

Figure 27 provides a high-level summary of our approach to embedding climate risk by each impacted PRT, details of which follow in subsequent sections. In addition to the PRT-specific plans for 2021, key priorities across all impacted risk types include clarifying or strengthening the first line and second line responsibilities, setting out risk acceptance authorities and setting appropriate targets for the relevant metrics for internal monitoring. While we have attempted to provide some useful metrics as early insights from our work in the spirit of transparency, please note the limited coverage of analysis for the metrics in some cases, and note that these are early results which are subject to change as methodology evolves and additional data becomes available.

Figure 27: Managing climate risk as a cross-cutting risk

		Status of climate risk integration		Early results for prototype metrics	
Principal risk		Achieved in 2020	Next steps	Scope of analysis	Summary of results
Credit  	CCIB	<ul style="list-style-type: none">Development of client-level climate risk assessment for corporate clients	<ul style="list-style-type: none">Directly engage with clients on climate risk and their adaptation and mitigation plans, covering majority of corporate exposureDevelop approach for non-corporate clients (such as financial institutions)Integrate climate risk into credit decisioning and transaction review processes	Transition risk analysis (change in probability of default (PD) over 30 years) at a company level for 100 corporate clients, covering 10% corporate exposure across a range of sectors	<p>Details in Figure 61.</p> <p>Under our orderly transition scenario, on average we see clients' probability of default (PD) deteriorating by c. 15 bps by 2035. As expected, impact increases over time under the assumption of no additional mitigation actions by clients, sovereigns or SCB, leading to 125-230bps increase in average PDs.</p>
	CPBB	<ul style="list-style-type: none">Analysis of current physical risk of residential mortgage portfolios	<ul style="list-style-type: none">Integrate physical risk profile in mainstream portfolio reviewsLeverage physical risk insights to inform risk mitigation measures (through insurance products or location strategy)	Physical risk analysis at an individual property level covering c. 60% of retail mortgage assets	<p>Details in Figure 62.</p> <p>Markets analysed so far have less than 25% exposure to extreme flood risks on a gross risk basis.</p>
Operational 		<ul style="list-style-type: none">Analysis and discussion of current physical risk for our own operations (branches and offices)Integration of physical risk evaluation in new property acquisition process	<ul style="list-style-type: none">Broaden coverage to client service resilience and critical third-party services	Physical risk analysis at individual site level for all of the Group's offices and branches	<p>Details in Figure 63.</p> <p>Flood is a key risk for the Group, with 20% of our properties being exposed to extreme flood risk globally. Storm risks are material for the GCNA region, but existing adaptation measures are expected to reasonably address these.</p>
Country  		<ul style="list-style-type: none">Integration of climate risk in sovereign rating and limits review processQualitative analysis and ranking of countries by vulnerability and readiness	<ul style="list-style-type: none">Quantitative analysis of sovereign credit rating under different climate scenarios	Concentration of exposure in most vulnerable and least ready countries by physical risk and transition risk	<p>Details in Figures 47, 49 and 64.</p> <p>Exposure to countries ranked the lowest (bottom 20% of all countries) covers only 9% for physical risk, and 12% for transition risk.</p>
Reputational 		<ul style="list-style-type: none">Integration of climate risk for high reputational risk transaction review processDevelopment of temperature alignment and transition readiness scores at a client level	<ul style="list-style-type: none">Strengthen transaction review process	Temperature alignment at a company level for 100 corporate clients, covering 10% corporate exposure	<p>Details in Figure 59.</p> <p>Exposure weighted average temperature alignment at 3.1°C reflects the global nature of our business, as it is aligned to the current global trajectory. With our enhanced measurement capabilities, our next priority is to define the pathway to meeting our target of aligning our lending to the Paris Agreement.</p>
Compliance  		<ul style="list-style-type: none">Process established for tracking various climate risk-related regulations at Group and Regional/ Country level	<ul style="list-style-type: none">Continue to track progress and enhance coverage at risk committees	Status of workplans to meet regulatory requirements	There are workplans in place for all existing climate risk regulations which are broadly on track.
Traded  		<ul style="list-style-type: none">Initial assessment of existing traded risk scenarios used for stress testing for linkages with climate risk	<ul style="list-style-type: none">Integrate climate risk considerations in relevant traded risk management processes and activities	Next step – integration into Traded Risk Framework	Next step – integration into Traded Risk Framework
Capital & Liquidity  		<ul style="list-style-type: none">Top-down sensitivity analysis of climate risk impacts across PRTs	<ul style="list-style-type: none">More granular bottom-up quantitative analysis and expanding coverage within and across PRTs	Yearly assessment of capital adequacy over a 5-year scenario including plausible but extreme stress	<p>Details in Risk section [x].</p> <p>Sensitivity analysis conducted in 2020 demonstrates capital adequacy for most PRTs, operational risk pillar 2 capital includes impact of physical risk on our own operations (although it is one of the least material contributors).</p>

 Physical risk
  Transition Risk

Credit risk

Credit risk is defined as the potential for loss resulting from a borrower or counterparty failing to pay or meet its agreed obligations to the Group.

For most banks, credit risk presents the largest proportion of risk on their books, and the industry has developed sophisticated and regulated credit risk management frameworks which provide a baseline level of natural protection from risks. However, these existing processes have not yet evolved to account for the unprecedented level and type of risk that climate change brings, and additional climate risk-specific analysis is required.

At Standard Chartered, our diversification across products, geographies, client segments and industry sectors prepares us to withstand a degree of macro climate risk due to existing structures in place which reduce risk associated with credit concentration.

We consider both physical and transition risks as potential credit risks and are strengthening our credit risk identification and assessment capabilities to reflect this. Additional detail on our credit risk approach can be found on pages 254 to 256 of our [Annual Report](#).

The following sections provide information on our existing climate-related credit risk management processes, as well as our plans to further advance and tailor our approaches for both our Corporate, Commercial and Institutional Banking (CCIB) and Consumer, Private and Business Banking (CPBB) businesses.

A. CCIB

Climate change presents a CCIB credit risk when physical and transition risks disrupt operations and impact a client or counterparty's business or operational model, thereby affecting their capacity to generate the income required to repay debt, as well as the capital and collateral that may back the loan.

While the climate risk drivers set out in Figure 28 can impact credit-worthiness at a client level, any material impact for Standard Chartered would be felt in the event of either a concentration of highly vulnerable clients, unprepared to respond to such risks; or a concentration of several large exposures to specific clients who may be most susceptible.

In response, in addition to our existing diversification principle addressing concentration risks, we are building our granular client-level climate risk assessments to better understand the specific impacts of climate risk at depth at the client level. Throughout 2021, we plan to cover the majority of our corporate exposure by directly engaging with the clients to share our climate risk insights and better understand these clients' adaptation and mitigation plans.

Figure 28: CCIB credit climate risk transmission channels, existing inherent controls and additional climate risk actions

Climate risk drivers	Potential impacts to credit-worthiness of some borrowers	Existing credit risk mitigation measures in place which inherently address climate risk	Additional climate risk-specific actions being undertaken
Transition risk Policy, technology or consumer preference shifts	<p>Potential for sustained decrease in revenue for counterparties due to a reduced market demand for higher carbon products/commodities (e.g. lower demand for internal combustion engine vehicles)</p> <p>Increased cost of unanticipated or premature write-downs, devaluations, or conversion to liabilities of high carbon assets to stranded assets</p> <p>Increased capital expenditure due to shifting product mixes; and increase in operating expenses due to rising carbon taxes</p>	<ul style="list-style-type: none"> Initial approval and subsequent renewal of credit limits at client level; robust evaluation of risk profile and mitigation plans, financial indicators, insurance coverage put in place by the client and credit grading as part of the credit decisioning process Existing risk appetite metrics around single name exposure, large exposure, and sector concentration Cyclical industries such as oil and gas are monitored closely as part of credit management, over and above the sector concentration limits Sector and segment deep-dives are periodically conducted to identify any necessary portfolio management actions Capital adequacy is ensured through both pillar 1 (majority of which is informed by Internal Ratings Based (IRB) models) and pillar 2 capital requirements (driven by severe but plausible stress scenarios, typically a 5-year scenario covering macroeconomic shocks and downturn) Majority of our CCIB exposure is short term (less than one year tenor), which allows us time to update our strategy should physical or transition risks increase rapidly 	<ul style="list-style-type: none"> Building client-level granular climate risk assessments Aggregating client-level assessments to portfolio level to identify any climate-risk related concentration which may not have been fully addressed by existing concentration measures (e.g. potential concentration of clients most vulnerable and least ready for physical risk) Over 2021, climate risk considerations will be integrated into the credit transaction review process (at initiation and periodic/trigger reviews) Granular climate risk quantification and scenario analysis being integrated into the pillar 2 capital assessment process
Physical risk Acute extreme weather events (such as more severe floods) and chronic changes in hazard levels (such as sea level rise)	<p>Potential for increased capital and operating expenditure driven by:</p> <ul style="list-style-type: none"> Impacts of acute weather risks such as asset damage, repair costs and business interruption Stress on natural resources (e.g. water stress due to increased droughts) 		

Figure 29: Summary of our climate risk-specific approach for CCIB credit

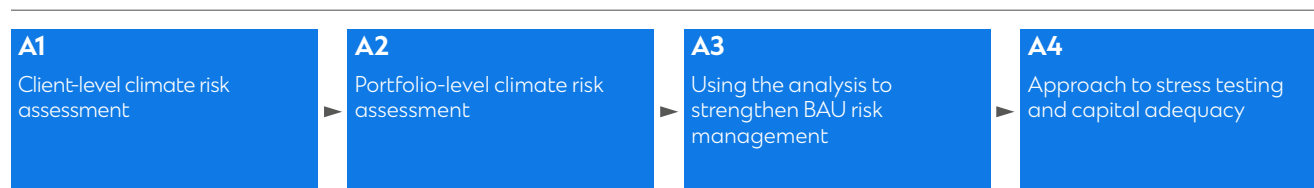
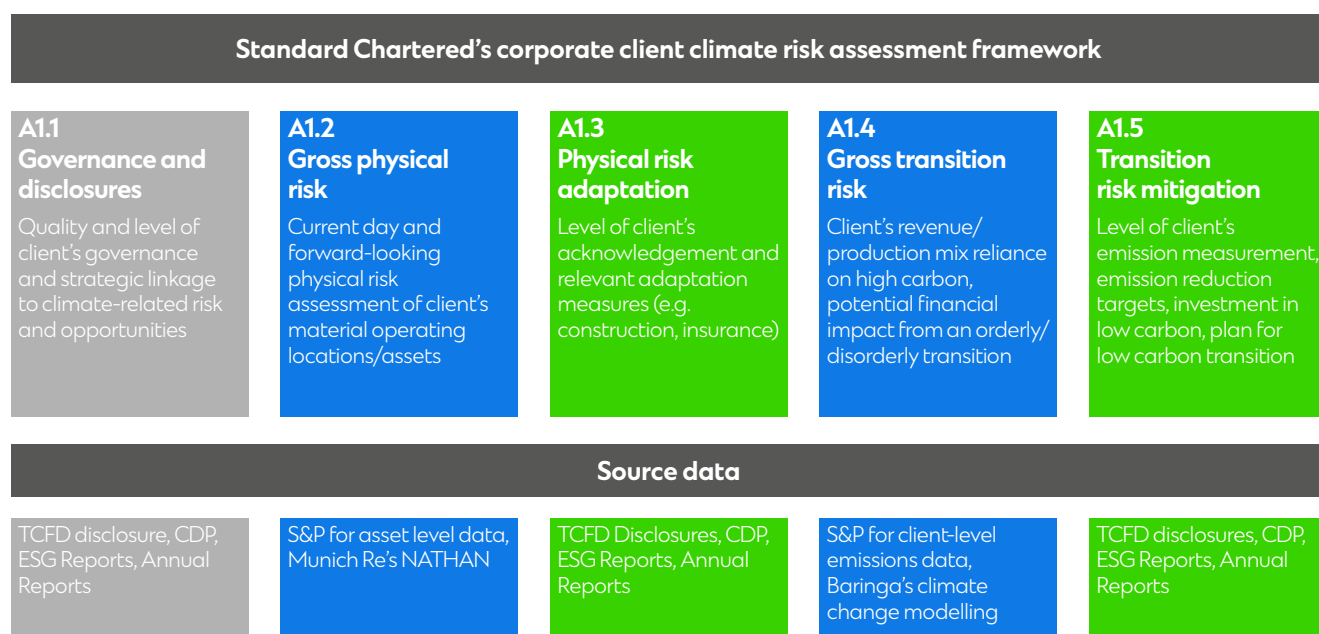


Figure 30: Our client-level climate risk assessment framework and data sources



A1. Client-level climate risk assessment

During 2020, we developed a granular client-level climate risk assessment framework, which provides a holistic overview of the gross physical and transition risks faced by a client, and the quality of their adaptation and mitigation strategies. Throughout 2021, we plan to complete this assessment for our top 2,000 corporate clients (by nominal exposure), which accounts for approximately 80 per cent of the Group's corporate exposure.

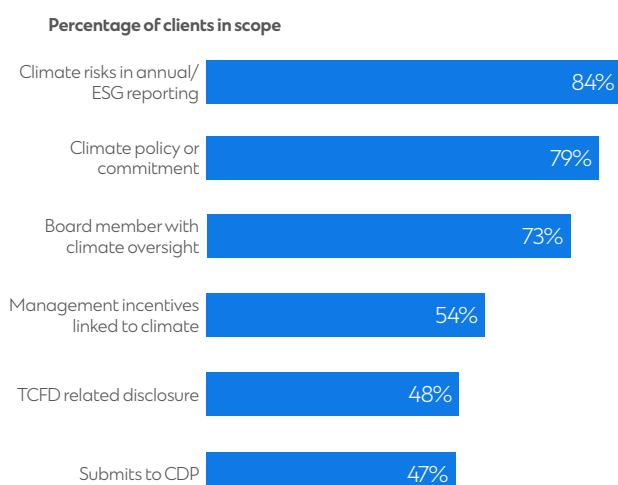
At the time of writing this report, we have completed the full analysis for 100 corporate clients by reviewing publicly available data, covering a range of sectors and 23 per cent of corporate exposure. This set of clients is referred to as 'clients in scope' for the remainder of this section. A summary of the sectors and regions covered through this analysis is provided in Appendix 6. Since this covers some of our largest clients, as we expand the coverage to smaller clients across our portfolio, we expect the availability of data to reduce. The following sub-sections provide an overview of the different factors we consider under each pillar, and emerging insights from our work to date.

A1.1 Governance and disclosures

This pillar seeks to understand how climate-related responsibilities are managed within an organisation and assesses the quality of the client's disclosures. The higher the clarity and quality of disclosure in this area, the better the indicator of client readiness to respond to climate-related risks and opportunities, and therefore the stronger their score.

The need to continually enhance disclosures and strengthen governance is clear. While 84 per cent of the clients in scope recognise climate risk's importance in the context of their business model, only 54 per cent have a clear linkage to management incentives. Notably, less than 50 per cent currently disclose their climate risks either publicly or through CDP. Awareness and consequent actions also vary significantly by region; for example, disclosure rates among the sample clients in the Africa & Middle East region was only 8 per cent, whereas more than 80 per cent of the clients in the Europe & Americas region scored well on disclosures. Through our client engagement, we are actively encouraging better disclosures which will improve the quality of our risk assessments.

Figure 31: Initial insights on governance and disclosures for clients in scope

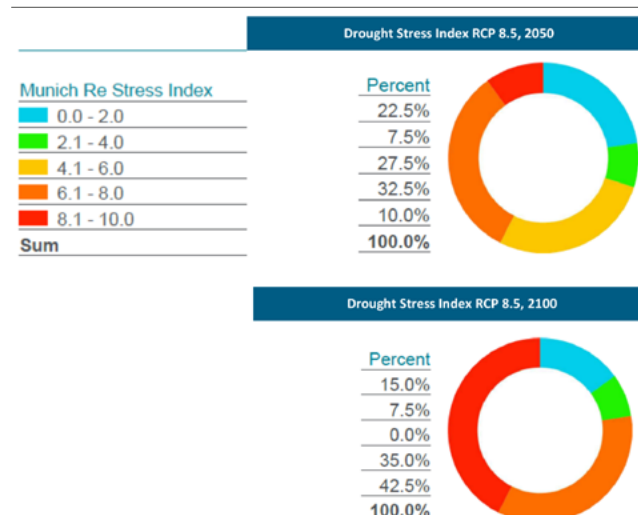


A1.2 Gross physical risk

We measure the gross physical risk profile for a client based on the current day and forward-looking risk profile of their material operating locations or assets. Through our client engagement, we are seeking to gather more extensive data on asset locations for our clients. Asset location data at a latitude/longitude level of granularity, even when we do not have direct exposure to those specific assets, is a new type of data the banking industry is starting to gather in response to climate risk, and improvement in this data over time will lead to more robust risk assessments.

Not all clients are expected to be equally exposed across regions or sectors. For example, water is an important input to mining operations and mines located in water stressed areas are likely to experience disruption during prolonged periods of drought that could be critical to a mine's operations. About a fifth of all mines analysed by S&P's Trucost are located in areas of extreme water stress, where the level of water consumption is above 80 per cent of all available water in the area. Equally importantly, these risks may get worse with time in the absence of an effective transition.

Figure 32: Forward-looking stress profile for asset locations of a mining client



Under the RCP 8.5 scenario, the mining client illustrated in Figure 32's asset locations, our analysis suggests that about 10 per cent of its assets are likely to be exposed to extreme drought risk by 2050, and the same number may increase to 42 per cent by 2100. It is crucial to incorporate such risks into the overall risk profile and consider adaptation measures.

A1.3 Physical risk adaptation

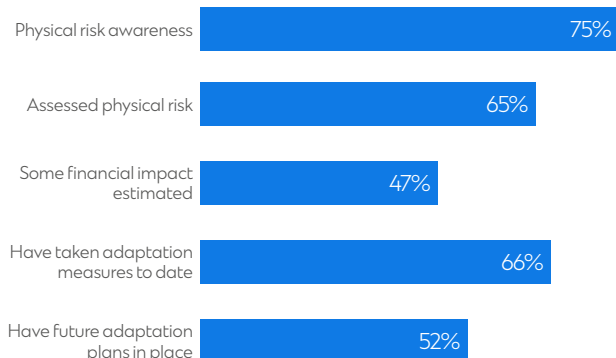
Physical risks can be mitigated with anticipatory adaptation strategies. Forward-thinking clients are already starting to assess the climate resilience of their assets and supply chains, which informs their adaptation strategy. Through this pillar, we are seeking to assess if the client has quantified the financial impact of physical risks and understand if they are taking proportionate adaptation actions; for example, through their location strategy for future asset acquisition, or building resilience through enhanced engineering and construction measures.

“We measure the gross physical risk profile for a client based on the current day and forward-looking risk profile of their material operating locations or assets.”

“Some clients in the mining sector are taking actions to prepare for changing weather events, such as improving evaporation monitoring and water desalination measures”

Figure 33: Initial insights on adaptation actions for clients in scope

Percentage of clients in scope



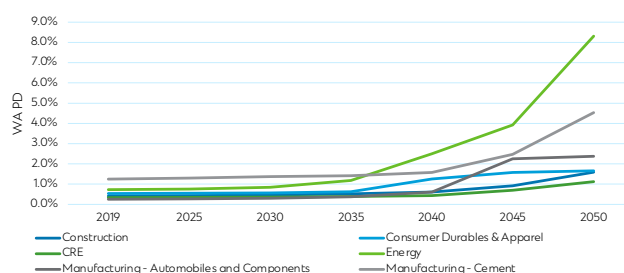
As Figure 33 illustrates, while 75 per cent of the clients recognise the potential impact of physical risk on their business operations, fewer than 50 per cent have assessed the financial impact of acute and chronic physical risks. About 65 per cent of the clients have taken some adaptation action already, although the adequacy of such adaptation actions needs to be assessed against their gross risk profile. As examples, some clients in the mining sector are taking action to prepare for changing weather events, such as improving evaporation monitoring and water desalination measures in case of reduced freshwater availability, or staggering work hours during peak summers to manage productivity losses due to heat stress. Some of the advanced clients are also exploring alternative risk-transfer options to test existing insurance policies under loss scenarios with their respective brokers and insurers. On a regional basis, clients domiciled in Greater China & North Asia and Africa & Middle East regions show lower adaptation readiness compared to clients in Europe & Americas and ASEAN & South Asia.

A1.4 Gross transition risk

Under this pillar we assess the changes in company financials, and consequent changes in credit ratings and probability of default under orderly and disorderly transition scenarios.

From our preliminary scenario analysis work, aggregated results on 100 corporate clients are provided in Figure 60 on page 72. At an individual client level, PD migrations are simulated over orderly and disorderly scenarios, quantifying the potential financial impact of transition risk. Based on the maximum increase in PD over the 30-year time horizon, a gross transition risk score is assigned (higher the PD increases, lower the score).

Figure 34: Exposure weighted average probability of default (WA PD) migration over our orderly transition scenario under an orderly 2 Degrees transition scenario



A1.5 Transition risk mitigation

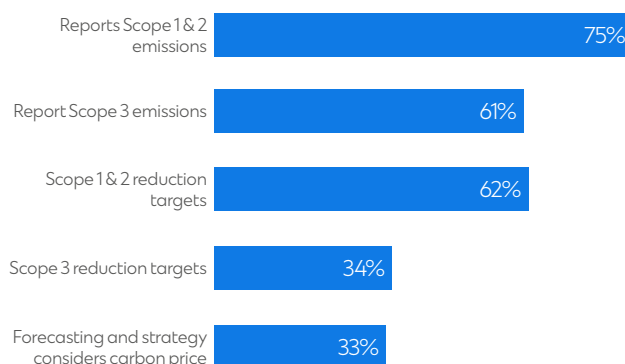
The final pillar of the transition risk assessment focuses on the client's transition readiness. The evaluation is based on a comprehensive in-house questionnaire which covers intent, progress, and the capability of the client to mitigate the risks in transitioning to a net zero economy.

As an example, in this pillar we consider whether clients report on Scope 1, 2 and 3 emissions, and whether they have set near-term targets on emission reduction by these categories. As we engage with our clients on climate risk throughout 2021, we will seek to better understand their investment plan, and progress made towards achieving these targets.

Our initial analysis on clients in scope shows higher availability of Scope 1 and 2 emissions data compared to Scope 3; 75 per cent of clients disclose Scope 1 and 2 emissions, whereas c. 60 per cent of clients disclose Scope 3 emissions. While c. 60 per cent of clients have reduction targets for Scope 1 and 2 emissions, only c. 30 per cent have targets in place to reduce Scope 3 emissions. We also found use of scenario analysis and incorporation of carbon price in strategic planning to be in the early stages, with only c. 30 per cent of clients considering impact of future scenarios with increasing carbon prices in their business planning. As we conduct more in-depth client engagement on climate risk, we will encourage our clients to strengthen their transition plans and readiness.

Figure 35: Transition readiness indicated by emission reduction targets, climate commitments and disclosure

Percentage of clients in scope



Case study 7

Example of a client-level climate risk assessment for physical and transition risk using scenario analysis

We are developing the scoring mechanism that underpins the client level assessment. This case study is a working example of our approach, using one client as an example. To derive meaningful risk differentiation across our portfolio we need to complete the initial results for the top 2,000 corporate clients. The scores noted in this case study are therefore indicative.

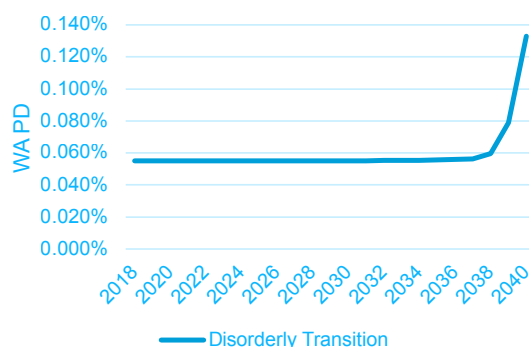
Preliminary results are for a large international oil and gas company with assets across the globe.

The scoring shown is based on the results after the client has been assessed against the 5 pillars of the client risk assessment framework described in A1.

Questionnaire Categories		Scoring	Client Assessment
1	Governance & Disclosures	75%	<ul style="list-style-type: none"> Client scores well on overall linkage to governance and strategy Acknowledge climate related risks, have board level oversight and policy committed to manage climate change; publishes fully aligned TCFD disclosures
2	Gross Physical Risk	50%	<ul style="list-style-type: none"> ~50% of client's operating locations exposed to extreme flood risk leading to the low score On a forward looking basis, locations exposed to extreme flood risk and heat stress
3	Physical Risk Adaptation	60%	<ul style="list-style-type: none"> Client's risk management systems are designed to assess potential physical risks to its operations and assets, and evaluation of the adequacy of safeguards. Client has invested in raising dikes and construction of sea walls to protect their facilities against possible storm surges,
4	Gross Transition Risk	38%	<ul style="list-style-type: none"> Based on it's current emissions client has a temperature alignment of 4.43 degrees driven by it's business model including high reliance of fossil fuels and is in line with peers Client is expected to face a significant shift in PD under a disruptive transition scenario while only a 2 notch shift in an orderly transition
5	Transition Risk Mitigation*	76%	<ul style="list-style-type: none"> Client has pledged it's support to align its business operations to the goals of the Paris Agreement Client reports on all scope 1,2, and 3 emissions also has short term emission reduction targets Client has a clear energy transition focus on lower carbon intensity, increased renewables in their business and investing in future through breakthrough technologies

PD migration in a disruptive disorderly transition scenario

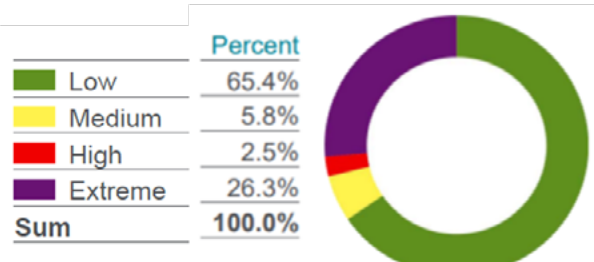
PDs are significantly impacted once carbon price crosses \$200 threshold, which is reflected in the low gross transition risk score above.



Physical risk profile with a focus on flood risk



Flood Risk Score – Distribution



A2. Portfolio-level climate risk assessment

Building on the client-level assessment, portfolio-level aggregation will be based on the various gross risk and readiness scores, to identify the clients most exposed and least prepared for physical risks and transition risks. Portfolio management actions can then be driven by concentration of clients and exposure in this category.

Our next priority is to complete the scoring for the majority of our corporate exposure to ensure that the scoring criteria create meaningful risk differentiation across the portfolio.

A3. Using the analysis to strengthen BAU risk management

Throughout the first half of 2021, we aim to finalise the assessment and scoring for our top 2,000 corporate clients, covering 80 per cent of our corporate net nominal exposure as at December 2020. As the client-level scores are finalised, throughout the second half of 2021 we plan to integrate the climate risk insights into the credit approval process, covering both initial approval and periodic renewal of credit facilities. This will ensure that as credit facilities get renewed, climate risk insights are progressively included for consideration for a material part of our corporate exposure, as required by the PRA's supervisory statement SS 3/19.

A4. Approach to stress testing and capital adequacy

For the 2020 Internal Capital Adequacy Assessment Process (ICAAP), the CCIB portfolio was evaluated for a transition risk impact driven by a sudden transition ensuing from rapid global action and policies with an impact materialising over the medium-term business planning horizon. For this, we focused on the high carbon sectors in the overall corporate exposure.

We used the equity price drops under the PRA's published guidance for the insurance industry in 2019, and leveraged Chief Credit Officers' judgement to translate the equity price changes to ranges of credit grade (CG) movements for clients in the high carbon sectors. For example, for oil and gas producers, we applied a 1-2 notch downgrade in CGs across all clients, irrespective of any mitigation plans clients may have. Potential Common Equity Tier 1 (CET1) impact was significantly less than the CET1 impact emerging from the macroeconomic pillar 2B ICAAP scenario. This provides comfort that the current macroeconomic shocks addressed in our pillar 2 capital are substantially more severe than potential transition-related shocks in the near term, and as such the Group is well capitalised.

We are working towards enhancing our climate risk analysis to be significantly more granular and bottom-up for 2021 ICAAP, leveraging many of the capabilities and metrics discussed in this report.

“Throughout the first half of 2021, we aim to finalise the assessment and scoring for our top 2,000 corporate clients, covering 80 per cent of our corporate net nominal exposure as at December 2020.”

B. Consumer, Private and Business Banking (CPBB)

Climate risk becomes a credit risk when weather events, increasing in frequency and severity due to climate change, damage property accepted as security or collateral for our lending programmes.

Figure 36: Areas of credit risk identified as impacted by climate-related physical risks

Climate risk drivers	Potential impacts to credit-worthiness of some borrowers	Existing credit risk mitigation measures in place which inherently address climate risk	Additional climate risk-specific actions being undertaken
Impact of physical risk on collaterals	<p>Potential for decrease in collateral/asset valuation, leading to increased PD and Loss Given Default (LGD)</p> <ul style="list-style-type: none"> Impacts of acute weather risks such as property damage Loss of insurance coverage or increase in insurance premiums to account for future climate change 	<ul style="list-style-type: none"> Established collateral management processes with periodic monitoring and oversight For new loans, robust property valuation process Geographic diversification and low average loan to value (LTV) ratios (around 45 per cent), which allows headroom to absorb decreases to property valuation Periodically refreshed Credit Approval Documents (CADs) that help in establishing risk acceptance criteria for our portfolios in each market Quarterly Portfolio Quality Reviews (PQR) to review the outlook of the economic and operating environment, portfolio quality indicators, and performance against risk appetite triggers and thresholds Capital adequacy is ensured through both pillar 1 (majority of which is informed by Internal Ratings Based models) and pillar 2 capital requirements (driven by severe but plausible stress scenarios, typically a 5-year scenario covering macroeconomic shocks and downturn) While mortgages are typically long tenor products, the average actuarial tenor is around 5-7 years, which allows us time to update our strategy should physical risks deteriorate rapidly 	<ul style="list-style-type: none"> Completed analysis of physical risk profile for majority of residential mortgage portfolios at a property level Over 2021, initiate coverage of physical risk concentration in mainstream retail risk reporting forums (such as PQR), and discuss necessary adaptation measures By end of 2021, leverage the physical risk insights in the periodic refresh of CADs to inform location strategy Over 2021, expand the understanding of impact of adaptation measures on physical risk ratings and the potential financial impact through collateral valuation impact

Figure 37: Summary of our climate risk-specific approach for CPBB credit



B1. Analysis of gross physical risk for single market

For each market, property addresses for our residential mortgage portfolio were converted to geocodes (latitude and longitude), which were run through the Munich Re tool. Case study 8 includes the results for our Singapore mortgage portfolio, which covers approximately USD12 billion in loans outstanding as at December 2020.

B2. Analysis of gross physical risk across markets

We replicated the analysis across six of our residential mortgage portfolios, covering c. 60 per cent of our total residential mortgage exposure. The quality of geocoding can be impacted by the data quality of addresses, but for all portfolios we were able to find geocodes with a high degree of confidence for more than 80 per cent of accounts.

Detailed results are provided in Figure 61 on page 74.

In summary, all markets assessed as examples had less than 25 per cent of exposure (loan outstanding amount) exposed to extreme flood risks, and wildfire risks were low across all the markets. Taiwan was assessed to have extreme exposure to storm risks. However, as previously explained, this is not a material cause for concern as it is driven by several factors including the overall region's exposure to tropical storms – therefore not unique to our mortgage portfolios – and the fact that adaptation measures such as recency and quality of construction and insurance coverage are not factored into the results.

“As part of the 2020 ICAAP, the Group prioritised the potential susceptibility of parts of its retail mortgage portfolio across its key markets to extreme physical risk scenarios.”

B3. Using the analysis to strengthen BAU risk management

Having developed the capabilities to run granular physical risk assessments, during 2021 we will focus on integrating the results (including forward-looking assessments) into mainstream risk reporting and governance forums, and formally integrate physical risk considerations into our risk governance documents. Key focus areas for 2021 will also include translating physical risk ratings to financial impact in terms of property valuation, and ensuring we have proportionate adaptation measures in place. Adaptation measures may include structural controls such as construction quality, and financial measures such as insurance coverage.

Throughout 2021, we will also look to strengthen data quality and monitor transition risks in our portfolio closely. While transition risk is not material for our mortgage markets at present, increasingly innovative green mortgage products are being launched which may lead to better data on energy efficiency of buildings and consequent policy actions.

B4. Approach to stress testing and capital adequacy

As part of the 2020 ICAAP, the Group prioritised the potential susceptibility of parts of its retail mortgage portfolio across its key markets to extreme physical risk scenarios, including increased frequency and intensity of typhoon risk, sea-level rise, and frequent flash floods. Key markets selected for the analysis included Hong Kong, Singapore, Malaysia, India and UAE, based on exposure size and known vulnerability to physical risks.

For each market, we estimated the severity of physical risk by looking at physical risk concentration for the top 200-300 accounts, and reduced PPI by a proportional amount. For example, as properties in Hong Kong showed concentration of storm risk, we applied an extremely conservative portfolio-wide PPI reduction of 25 per cent, whereas for Singapore the applied reduction was 8 per cent – also quite conservative given observed data. Despite the extreme stress considered, results indicated an overall CET1 impact lower than the pillar 2B scenario. This demonstrates that in the short- to medium-term, we are well capitalised to withstand physical risk driven by reduction in property valuation.

For the 2021 ICAAP, we intend to use completed account-level physical risk assessments for all accounts in our top eight markets. We will apply differential valuation reductions at an account level driven by risk severity, and also aim to take forward-looking, long-term physical risks into consideration.

Case study 8

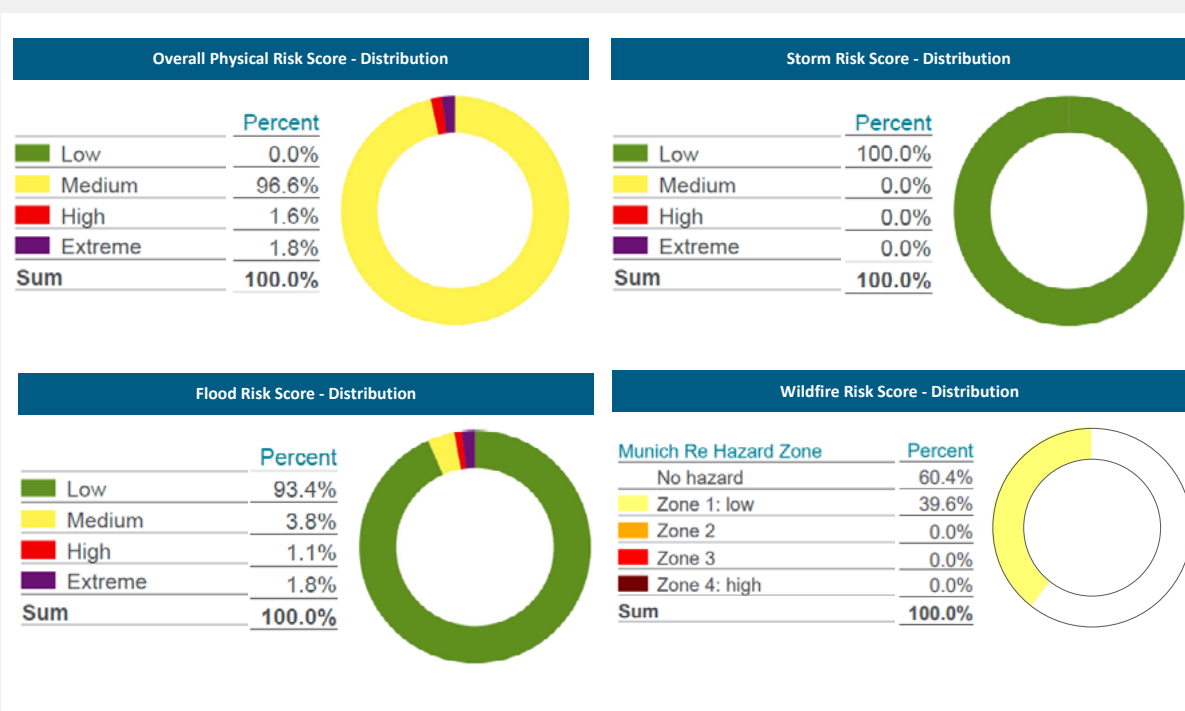
Singapore mortgage portfolio – physical risk assessment

Using Munich Re's NATHAN, we analysed our mortgage portfolio in Singapore for its current physical risk assessment. The assessment is focused on the potential risk to the collateral from underlying hazards such as storms, floods and wildfires.

Our analysis shows that our Singapore mortgage portfolio faces no significant current day risk from storms or wildfires. 'Extreme' flood risk represents less than two per cent of the Singapore mortgage collateral, with a further one per cent categorised as 'high' risk. Unsurprisingly, the zones highly exposed to flood risk are around the river in Singapore.

It is important to note however, these risk profiles do not factor in adaptation measures such as the significant presence of dams all along the river, and building-specific adaptation measures such as construction quality, and the availability of basement and water management controls. In some instances, adaptation will be in place already and where it is not, the above gross risk indicators act as an engagement platform for possible future plans, where relevant.

On a forward-looking basis, less than one per cent of the current exposure is exposed to extreme sea-level rise by 2100 under RCP 8.5 scenario.



Operational Risk

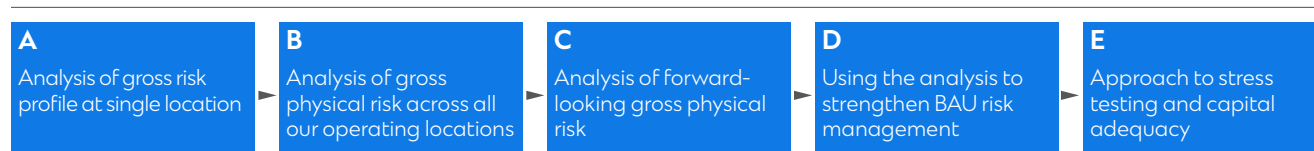
We define operational risk as the potential for loss resulting from inadequate or failed internal processes and systems, human error, or from the impact of external events. We have prioritised climate-related physical risks in the context of operational risk.

Figure 38: Areas of operational risk identified as impacted by climate-related physical risks

Climate risk drivers	Potential impacts to areas of operational risk	Existing operational risk mitigation measures in place which inherently address climate risk	Additional climate risk-specific actions being undertaken
Physical risk impacts on our premises and physical assets	Extreme floods or storms impacting our offices or branches, leading to repair costs, regulatory penalties and employee safety concerns	Structural mitigation: each building typically has structural adaptation plans (e.g. most buildings exposed to extreme flooding include a basement to partially mitigate impacts of flash flood) Financial mitigation: we have extensive buildings insurance in place	Completed physical risk profiling of all our operating locations (branches and offices), and discussed the risk profile at various risk committees Included physical risk quantification as part of our new building acquisition checklist, meaning physical risk is explicitly considered for any new building that we acquire globally
Physical risk impacts on our client service processes	Extreme floods or storms at multiple locations impacting our business continuity plans with consequent impact to services we provide to clients (e.g. transaction processing)	Our critical operating locations have business continuity plans which include alternative geographically diversified sites (e.g. there are plans for critical processes out of Chennai to split operational delivery between Bangalore, Kuala Lumpur or Tianjin)	Approach to be developed over 2021, leveraging our physical risk assessment capabilities
Physical risk impacts on critical third-party vendor services	Extreme floods or storms impacting the location from which our critical third parties provide their services (including back-up locations and their business continuity plans)	Critical third parties are required to have their internal business continuity plans	

In addition to the risk mitigation actions set out in Figure [37], it is also worth noting that the Group leases many of its sites; therefore, the impacts of physical risk are not quite as consequential as were they owned assets. For example, any necessary repair costs will be borne by the owners of the building. Finally, through our ICAAP, various scenarios and associated costs are explored. Any severe but plausible financial impact is then considered in capital planning.

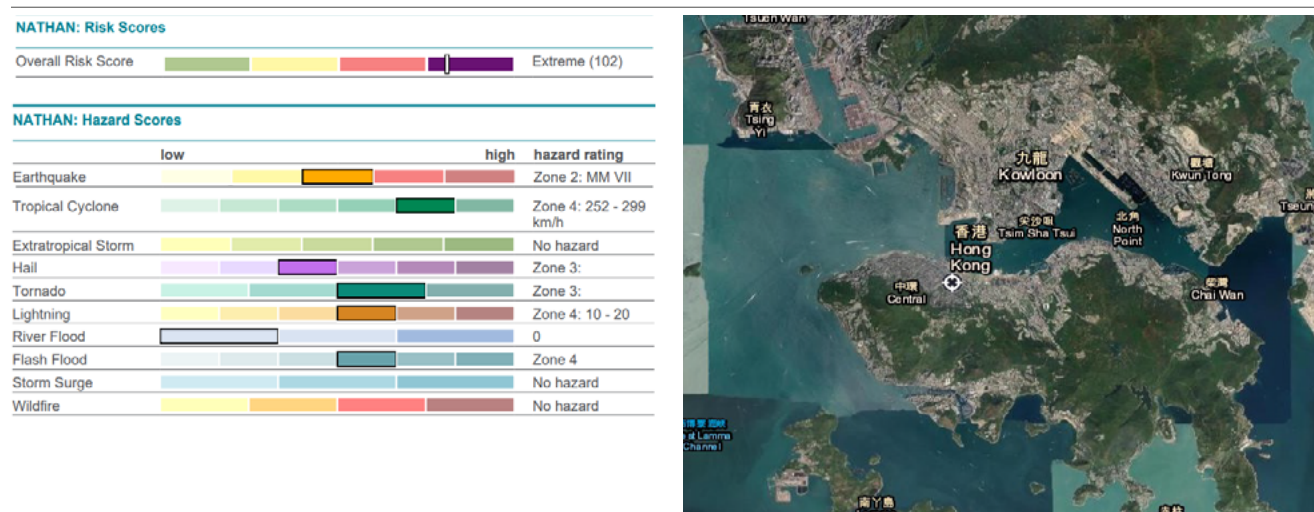
Figure 39: Our approach for identifying, quantifying and managing physical risks to our own operations



A. Analysis of risk profile at single location

Each individual building address was converted to latitude/longitude using our proprietary geocoding algorithm, prior to running the risk assessments. Each location was then risk-scored for a range of hazards including flood, storms and wildfire.

Figure 40: Single location assessment of our head office in Hong Kong



As evident from Figure 40, the overall risk score falls in the 'extreme' categorisation according to Munich Re's rating scale, driven by the 'extreme' risk of tropical cyclone at this location (likely wind speeds in the zone of 252-290 km/hour). Other hazards are found to be largely benign (or non-existent, such as wildfire) or moderate, such as flash flood. Notably, due to being located away from the coast, this building is not exposed to any significant storm surge risk, which is a material risk for the coastal areas in the region. Typically, buildings in Hong Kong are structurally built to withstand high wind speeds; for example, through use of reinforced concrete in building construction, given that by virtue of its geographic location the region is known to be exposed to extreme tropical cyclones. Past experience also demonstrates that these structures are generally effective; for example, Typhoon Mangkhut in 2018 caused no material damage to our operating locations in Hong Kong.

Some key points to note:

- The overall risk score is based on two factors – the combined impact of all underlying hazard scores such as flood, storm and wildfire which are based on standardising the hazard severities on a global scale, and normalised claim experience from Munich Re's global businesses. It does not mean that the location is unviable as it does not factor in adaptation measures. It only indicates the gross risk exposure, which is then taken into consideration by insurance and re-insurance underwriters for premium pricing, among other things such as availability of flood defences, construction quality, availability of basement, number of floors and building safety procedures.
- The storm hazard score is generally extreme around the region, it is not unique to the building itself and therefore out of our control. This is demonstrated in the tropical cyclone map shown in Figure 41.
- Therefore, while the overall gross risk score is a valuable insight, it is not by itself the only indicator of risk or a critical factor in decision-making. The key consequence of the risk rating is in ensuring there are proportionate adaptation measures in place at the individual sites. For our Hong Kong office in this example, there are adequate adaptation measures which have been demonstrated to be resilient in the past as noted above.

B. Analysis of gross physical risk across all our operating locations

Figure 42 demonstrates the overall risk scores and different hazard scores across all of our operating locations. These locations are spread all over the world representing the global nature of our business.

Figure 42: Gross physical risk profile across all operating locations

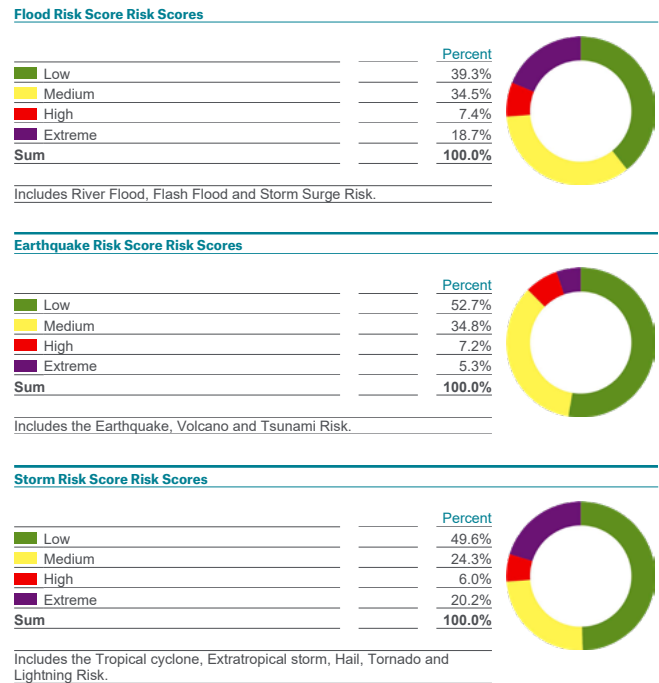
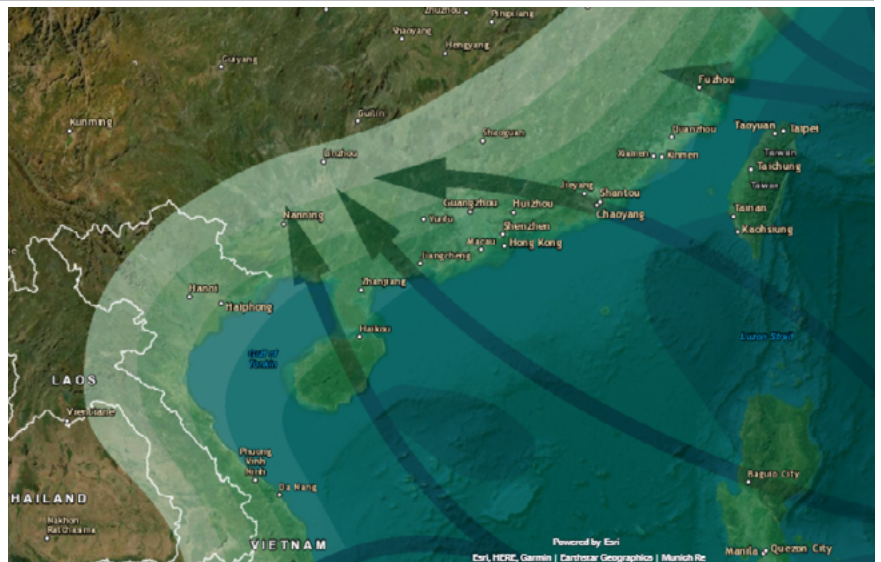


Figure 41: Regional tropical cyclone hazard map for Asia

This figure demonstrates the tropical cyclone maps over parts of the Asia region. Note that almost all of the Hong Kong region is located in the highest category of storm risk, evidencing that the extreme storm risk identified in the region is not unique to our buildings.



At the overall level, key risks across our operating locations are flood and storm, each hazard having approximately 20 per cent of properties in the 'extreme' risk category. This is not surprising, as many of our core footprint markets across Asia, Africa and the Middle East are those most exposed to the physical risks from climate change.

The majority of the extreme storm risks are concentrated in the North Asia region, given the region's general exposure to extreme wind speeds. This is not a material cause for concern as the construction quality in these regions is typically quite high given known exposure to tropical storms and recency of construction. In many flood prone areas, existing controls and risk mitigation measures have been demonstrated to be effective, for example during floods in Southern India in 2015 which heavily impacted Chennai.

The Group-wide risk profile can also be broken down by regions and countries, to provide further insights to relevant business units and direct additional adaptation actions if needed. Refer to Appendix 5 for an example of such a risk profile for our offices in South Korea.

C. Analysis of forward-looking gross physical risk

The speed of climate change over the next several years will drive how these risks change in the future. If the current trend of emissions continues, the RCP 8.5 scenario is likely to play out which will significantly worsen the frequency and severity of acute risks and make chronic risks such as sea-level rise more destructive. Under RCP 8.5 scenarios, two per cent of our buildings are likely to be exposed to extreme sea-level rise risk.

D. Using the results to strengthen BAU risk management

In 2020, we made the following progress in integrating climate risk into operational risk management:

- Applied the Munich Re physical risk assessment tool to perform granular physical risk assessment across all our own operating sites (offices and branches). Each assessment is at the specific location of individual properties (i.e. latitude and longitude of the building location) – so representing unprecedented granularity in our risk assessment capabilities. Results of this assessment were discussed at the Property Non-Financial Risk Committee and are provided in Figure 42.

- Integrated physical risk assessments in our location strategy and mainstream risk controls. This means that going forward, any new building acquisition globally will need to record the gross physical risk ratings and the risk mitigation plan for more severe gross risks.
- Integrated climate-related physical risk scenario into the mainstream operational risk stress testing process through the 2020 Internal Capital Adequacy Assessment Process (ICAAP).

Over 2021, we intend to continue embedding climate risk within operational risk, including:

- Operationalise integration of climate-related physical risks in client service resilience/business continuity plans across our own operations, and in our critical third-party vendor management processes.
- Broaden and strengthen scenario analysis and stress testing capabilities, including incorporation of forward-looking physical risk assessments.
- Explore transition risk elements particularly in supply chains and critical third parties as part of our broader plans around sustainability risks, for example understanding decarbonisation plans of our critical third parties.
- Enhance periodic discussion of risk profile at the Group-level Property Non-Financial Risk Committee and establish governance at regional and country-level risk committees supported by relevant management information and metrics.
- Strengthen the oversight and second line of defence responsibilities for managing climate risks as it relates to operational risk.

E. Approach to stress testing and capital adequacy

Through our ICAAP process, various severe but plausible scenarios are considered for all risk types, including operational risk. Within operational risk, there are more than 15 risk-type specific scenarios considered, i.e. different scenarios for systems availability and financial crime compliance, of which one scenario is related to climate risk.

Figure 43: Projected sea-level rise in North Asia region, RCP 8.5, 2100



The scope of these scenarios is determined by focusing on the most material areas of risk. For example, in the 2020 ICAAP, we considered a simultaneous storm in Hong Kong and drought in India as an extremely severe but plausible scenario, as these markets are key to client services and business continuity. For our 2021 ICAAP, we are broadening the scope to our material operating locations which are exposed to extreme flood risks and construct an extreme scenario where multiple locations across the world get flooded over a one-year period. For the climate risk scenario, workshops are undertaken jointly by operational risk, climate risk and subject matter experts including property and client service resilience teams, to estimate the financial impact through regulatory and repair costs, which is then fed through the operational risk capital calculation engine.

There are a couple of key takeaways from our analysis to date:

1. We are well capitalised to respond to physical risks to our operations in the short term as our pillar 2 operational risk capital assessment already factors in scenarios involving physical risks disrupting our operating locations and client service resilience; and
2. In our experience, the costs associated with such a scenario are still relatively minor compared to the other risk-type specific scenarios conducted for operational risk pillar 2 capital assessment (i.e. in terms of financial impact, the climate scenario ranks towards the bottom few of the 15 or more scenarios run within operational risk).

Country risk

Country risk is defined as a risk that a sovereign will fail to honour its obligation in a timely manner. It can arise due to a volatile domestic economic and political environment leading to deterioration in macroeconomic and fiscal strength⁷.

Climate change can have a material impact on country risk due to changing demands for goods and services, either directly or indirectly, and up and downstream supply chain. Physical risks may impact productivity across a country with consequent macroeconomic impacts. For example, for a country heavily reliant on the agriculture sector, increased severe, acute weather events and chronic changes can impact crop yields leading to reduced Gross Domestic Product (GDP). Transition risks may have a significant impact on country-level financial indicators as well; for example, countries heavily reliant on fossil fuel import or export are likely to be significantly impacted in a climate transition, particularly a disruptive transition where economies have less time to adjust. Figure 44 provides examples of how climate risk can affect a country's risk profile⁸:

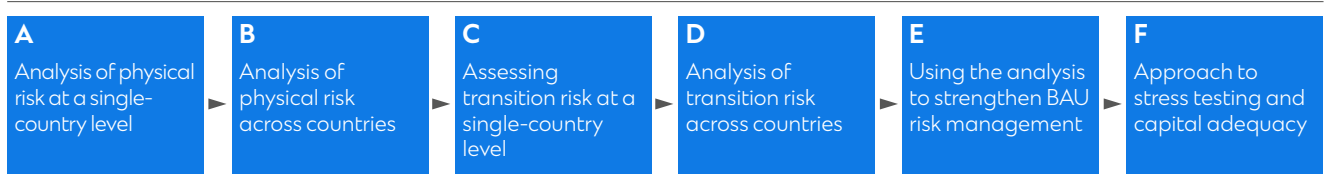
A. Analysis of physical risk at a single country level

For the first generation of risk assessments, we have used public research published by two reputable international sources, namely, University of Notre Dame's Global Adaptation Index (ND-GAIN) and German Watch. The combination of the two ratings considers a vast array of indicators to assess sovereigns' vulnerability to physical risk events and their readiness to mitigate the risks.

Figure 44: Country risk climate risk transmission channels, existing inherent controls and additional climate risk actions

Potential climate risk drivers	Examples of impact due to physical and transition risks	Existing country risk mitigation measures in place which inherently address climate risk	Additional climate risk-specific mitigation actions being undertaken
Physical risks (acute and chronic)	<ul style="list-style-type: none"> Reduction in business investment due to the uncertain/volatility of extreme climate events Loss of productivity due to extreme weather events Losses to state-owned insurers Increased expenditure on public health Disruption to imports and exports due to natural disasters 	<ul style="list-style-type: none"> Country risk is managed through a robust framework which includes IRB Sovereign scorecard and PD model for credit grading, outputs of which are benchmarked with rating agencies Risk identification happens through multiple channels such as Country Risk Early Warning Systems (CREWS), a triage-based risk identification system which is reviewed quarterly Risk appetite limits are set on concentration of exposure in a single country Capital adequacy is ensured through both pillar 1 (majority of which is informed by IRB models) and pillar 2 capital requirements (driven by severe but plausible stress scenarios, typically a 5-year scenario covering macroeconomic shocks and downturn) 	<ul style="list-style-type: none"> Climate risk (both physical and transition risk) related key metrics have been integrated into the quarterly sovereign rating and limit review process Any out-of-cycle reviews also include climate risk considerations Climate risk factors have been integrated into CREWS Additionally, we have developed an initial rank ordering of countries by physical risk and transition risk, capturing both vulnerability and readiness. This provides a structured framework to assess climate risks at a country level, compare countries and assess exposure concentration Over 2021, we plan to conduct quantitative scenario analysis based on various physical and transition risk drivers
Transition risks, particularly in a disruptive transition scenario	<ul style="list-style-type: none"> Additional expenditure on advancement of low carbon technology Stranded assets causing significant disruptions to trade outflows, primarily for fossil fuels Devaluation of corporates affected by low carbon economic policies Impact to GDP if materially dependent on fossil-fuel or other high carbon products as a net exporter 		

Figure 45: Our approach for identifying, quantifying and managing physical and transition risks within country risk



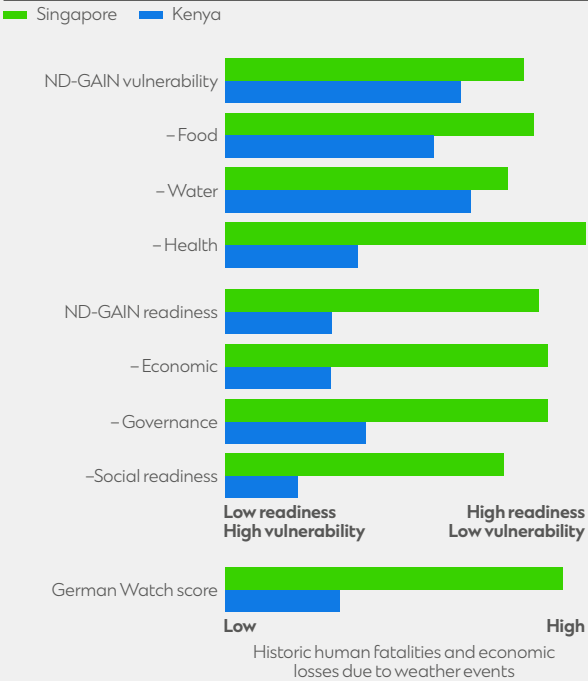
⁷ Country risk has been recently reclassified as an overarching risk type in the ERMF

⁸ Compiled using multiple sources including Batten, Sowerbutts, and Tanaka (2018)

Case study 9

Sovereign physical risk assessment for Singapore

Singapore ratings from ND-GAIN and the Global Climate Risk Index Kenya selected for comparison

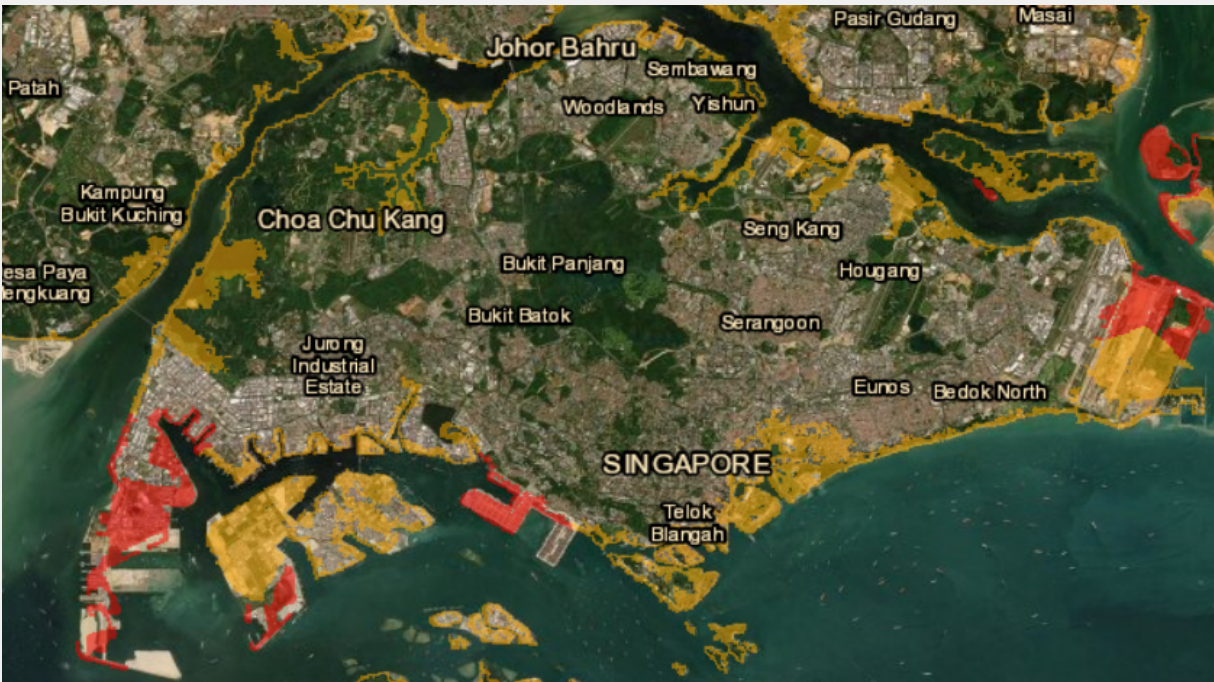


Risk profile

- Singapore is reported to have high readiness and low vulnerability across the ND-GAIN score indicators, compared to other countries such as Kenya.
- The Global Climate Risk Index (German Watch) shows Singapore to rank second in the annually published rankings based on losses both in terms of human lives and economy.
- As an island nation, Singapore will experience sea-level rise and storm surges but the likelihood of suffering losses is reduced with its plans to invest in climate adaptation infrastructure.

Adaptation plans

- Singapore has invested heavily to better understand and predict physical risk by setting up the Centre for Climate Research Singapore (CCRS).
- Since 2011, Singapore has invested S\$1.8 billion on flood resilience and to protect for rising water levels.
- New developments, redevelopments and reclamation must be at least 4m above sea level.
- In its 2020 budget an initial S\$5 billion was set aside for coastline and flood protection.



Output from physical risk tool of Singapore in 2100, under a worst-case scenario of RCP8.5. Red = prone to sea-level rise

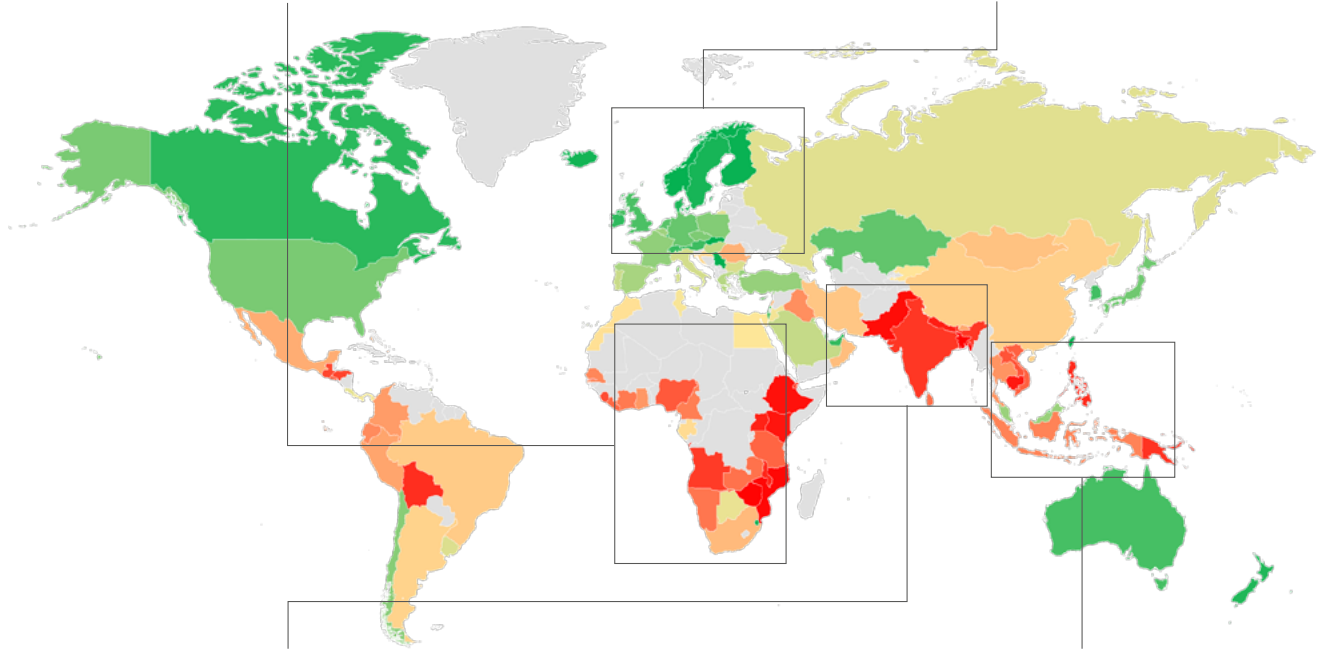
A country with low vulnerability and high readiness is better prepared to withstand shocks from climate change compared to a country with high vulnerability and low readiness. For each sovereign, a weighted sum of the two rankings was used to derive a single score, which was further compared with other sovereigns to derive the physical risk ranking.

B. Analysis of physical risk across countries

Figure 46: Overview of our global physical risk ranking

Some regions of Africa are drought-prone, causing desertification and other forms of land degradation in some areas. This can negatively impact agricultural production and potentially lead to conflicts and food insecurity.

In the near to medium term, Europe is considered more resilient to physical risks, despite increasing incidences of heatwaves and consequent loss of life and productivity.



In South Asia, economies are predominantly based on agriculture, forestry and fishing and are exposed to elevated levels of acute risks (such as floods) and chronic risks in many cases (e.g. coastal regions to sea-level rise, inland areas to drought stress). Extreme heat stress and consequent loss of life and productivity are also key contributors to the region's risk profile.

Many regions in South East Asia are particularly exposed to storm risk (including observed category 5 typhoons) and consequent flooding. Low-lying coastal areas and river delta regions are extremely vulnerable to sea-level rise and coastal flooding, impacting key industries such as agriculture and fishing.

For assessing the concentration of country risk exposure to physical risk, we order the countries using the physical risk ranking calculated above. For simplicity of reporting, we split the rank-ordered data into 10 categories, each category containing an equal number of countries. As an example, the United States belongs to category three in this assessment.

As Figure 47 demonstrates, the majority of our Gross Country Risk exposure (GCR, defined as the sum of local currency and foreign currency exposure) is distributed over the sovereigns with strong rankings (i.e. categories one to six), with the most vulnerable and least ready countries (covering categories nine and 10) constituting only nine per cent of total GCR exposure.

Figure 47: GCR exposure distribution as at December 2020 across the physical risk categories

Category	1 (Best)	2	3	4	5	6	7	8	9	10 (Worst)
Exposures %	15%	23%	22%	2%	1%	25%	1%	2%	6%	3%

“In South Asia, economies are predominantly based on agriculture, forestry and fishing and are exposed to elevated levels of acute risks.”

C. Analysis of transition risk at a single country level

Unlike physical risk, the systematic research on the linkages between transition risk and the sovereign rating is quite limited, and most ratings agencies are still in the process of developing a holistic robust approach to integrate climate-related transition risk into sovereign risk assessment. As such, we have developed a first-generation internal approach to qualitatively assess the impact of transition risk based on observed and forward-looking data points. Our approach consists of three modules of assessment, covering both vulnerability and readiness.

(1) Module 1: How much transition is required?

The dependence of the sovereign on carbon-intensive energy sources, and the concentration of Gross Domestic Product (GDP) in high-carbon sectors are key indicators of its vulnerability to transition risk. For example, the economies which are highly reliant on coal-based power plants and the economies which are heavily reliant on oil-based exports will likely have to make far greater efforts to transition to a low carbon economy. The key factors assessed in this module are current emission levels, emission productivity, carbon concentrations in trade flows and energy mix.

(2) Module 2: Current progress and future plans

The key factors are related to the progress which the sovereign has made in reducing its emissions levels and the plans for 'greening' the energy supply infrastructure (i.e. forward-looking energy mix as available from S&P Trucost). The module also considers the GHG amount covered with a carbon tax or Emissions Trading Schemes in the country.

(3) Module 3: Capability to execute a low-carbon transition

This module explores whether the sovereign maintains strong institutional strength and the right atmosphere to drive green investments, given such a transition is likely to require attracting new investment.

The individual scores for each module are combined in a weighted manner to produce a single quantitative score. The sovereign transition risk ranking based on the scores provides relative ranking of the sovereign in terms of the climate transition risk.

Case study 10

Singapore's transition risk profile

Sovereign transition risk assessment for Singapore

Risk profile

- Climate Action Tracker and our internal assessments rank Singapore as higher risk due to its heavy reliance on fossil fuel-based energy
- Singapore's CO₂ emission per capita is higher than many other comparably developed countries
- Singapore is predicted to overachieve its NDC targets for lowering emissions, though Carbon Action Tracker describes the targets as weak
- Singapore Government has announced a national initiative to advance the sustainability agenda, including a review of carbon pricing by 2023

Mitigation plans

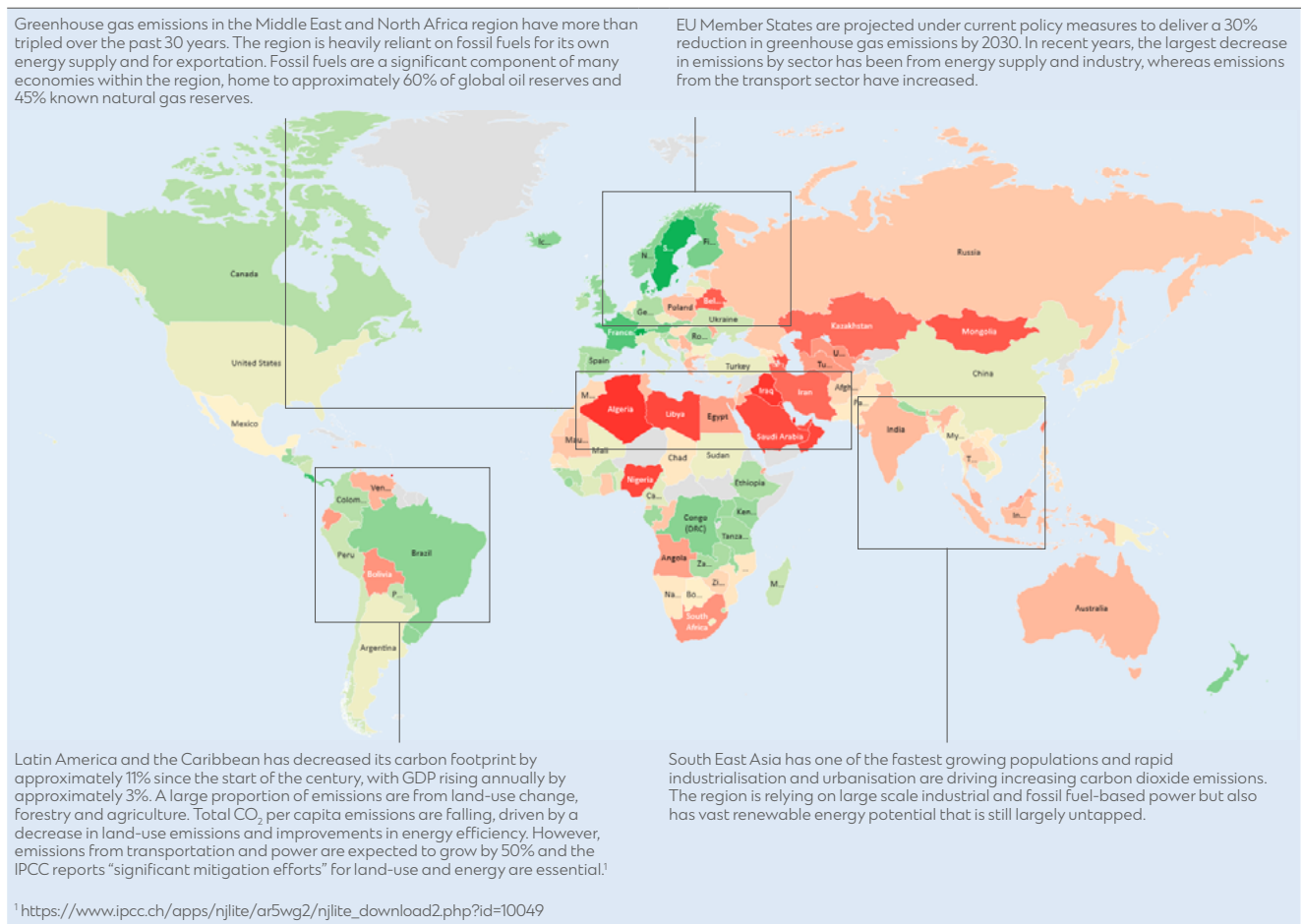
- Singapore is one of the first countries to implement a carbon tax, but achieving the goals of the Paris Agreement is likely to require a higher carbon price than the current value
- Singapore plans to phase out petrol and diesel vehicles by 2040
- The region is encouraging greener forms of transport such as cycling and walking, to reduce carbon emission but also to improve air quality and public health

Data inputs considered in our country-level sovereign assessments

Higher score here implies higher risk	Singapore	United Kingdom
Overall score	57	30
Module 1	61	32
– CO ₂ emissions (metric ton per capita)	6.7	5.8
– Production-based CO ₂ productivity, USD/kg CO ₂	11.3	8.3
Module 2	61	34
– CO ₂ emissions (metric ton per capita) – growth in last 5 yrs	74	82
– Projected share of non-renewable energy in 2030	95%	30%
Module 3	24	9
– Global Competitiveness Index	5.7	5.5
– Count of environment related patents	50,000-100,000	>100,000

D. Analysis of transition risk across countries

Figure 48: Overview of our global transition risk ranking



For assessing the concentration of country risk exposure to transition risk, we aggregate the exposure in 10 categories with an equal number of countries, in a similar way to the approach described for physical risk. As an example, the United States belongs to category 5 in this assessment.

As Figure 49 demonstrates, the majority of our GCR exposure is distributed over the medium-risk categories, with the most vulnerable categories (categories 9 and 10, where most of the longer-term transition risks lie) covering 12 per cent. For sovereign transition risk, concentration in categories 1 and 2 should be monitored as well, as these countries are more likely to introduce stricter transition-related policies in the shorter term.

Figure 49: GCR exposure distribution as at December 2020 across the transition risk categories

Category	1 (Best)	2	3	4	5	6	7	8	9	10 (Worst)
Exposures %	10%	1%	5%	10%	20%	12%	14%	16%	6%	6%

E. Using the analysis to strengthen BAU risk management

In 2020, we made good progress in integrating climate risk into country risk management processes:

- Produced our own initial pilot sovereign climate risk rankings, separately for physical and transition climate risk.
- Updated our country risk quantification approach to consider physical and transition risks, through integration into our internal Country Risk Early Warning System (CREWS).
- Climate risk is also considered in the quarterly regional sovereign review process as well as any out-of-cycle assessment.

As climate risk is already operational in country risk processes, 2021 is about enhancing the associated integration points and performing quantitative stress testing.

- Integrate climate-related risk scenario into the mainstream country risk stress testing process through the 2021 ICAAP.
- Enhance the methodology for assessing sovereign climate risk rankings.
- Build capacity to include climate risk metrics in mainstream country risk reporting to various committees.

F. Approach to stress testing and capital adequacy

Country risk exposures and associated capital requirements are subject to annual stress tests, typically driven by a five-year macroeconomic stress scenario and consequent deterioration in sovereign credit grades.

In our 2020 ICAAP submission, we explored country risk implications qualitatively, and concluded that given the relatively small concentration of GCR exposure in the most vulnerable countries, existing macroeconomic stress tests result in sufficient capital buffers to withstand potential climate risk shocks in the short term.

During the 2021 ICAAP and BES, we will explore a more quantitative approach to assessing climate-related sovereign credit impact, by analysing sovereign bond yields and spreads under various climate scenarios over longer time horizons.

Reputational risk

We define reputational risk as the potential for damage to the franchise, such as loss of trust, earnings or market capitalisation, because of stakeholders taking a negative view of the Group through actual or perceived actions or inactions – including a failure to uphold responsible business conduct or lapses in our commitment to do no significant environmental and social harm through our client and third-party relationships or our own operations.

Climate change and the urgency to act has become an increasing concern for most individuals. The financial sector has a role to play in addressing this shared global challenge and is expected to act responsibly, limiting its negative impact in relation to activities that may contribute to accelerating global warming. With increasing expectations on banks from governments, regulators, NGOs, investors and individuals, failing to act responsibly brings reputational risk. For banks, climate-related reputational risk typically comes from being perceived to be on the wrong side of the low carbon transition, by supporting clients or activities which are misaligned with the goals of the Paris Agreement.

In 2020, we strengthened the way we manage climate-related reputational risks within the Reputational Risk Framework and enhanced the risk assessments conducted for clients and transactions, especially for those in high carbon sectors.

Initial insights from an analysis on 100 corporate clients indicate an average temperature alignment of 3.14°C, which indicates that our portfolio is broadly in line with global trends. However, this only addresses the ‘measure’ part of our commitment to “measure, manage and ultimately reduce the emissions linked to our financing”, and we recognise the need to set clear targets to manage and ultimately reduce our temperature alignment to be in line with the Paris Agreement net zero objective. Over 2021, we will continue to expand the coverage of temperature alignment calculation, and systematically integrate them, together with clients’ transition scores, for transaction-level decision-making to address the ‘manage and reduce’ part of our commitment.

In January 2021, the Reputational Risk Framework was uplifted to be the Reputational and Sustainability Risk Framework to integrate environmental and social risk management with a focus on “Do No Significant Harm” and “Responsible Business Conduct” across clients, third parties and the Group’s own operations.

Figure 50: Reputational risk climate risk transmission channels, existing inherent controls and additional climate risk actions

Potential climate risk drivers	Examples of impact due to climate risk	Existing reputational risk mitigation measures in place which inherently address climate risk	Additional climate risk-specific mitigation actions being undertaken
Primarily transition driven, particularly acute if the Group is perceived to be misaligned to its commitments	<ul style="list-style-type: none"> • Supporting clients who are heavily misaligned with the Paris Agreement without a credible transition plan 	<ul style="list-style-type: none"> • Individual transaction review based on reputational risk assessments • Established risk materiality-based authority matrix, requiring cases assessed as high or very high reputational risk to be approved by the Group Responsibility and Reputational Risk Committee (GRRRC) • Portfolio management through Position Statements and underlying Risk Acceptance Parameters for clients in sensitive sectors, many of which are high-carbon sectors such as fossil-fuel based power generation and oil and gas producers 	<ul style="list-style-type: none"> • In 2020, we introduced qualitative climate risk criteria (around disclosure and commitment to align to the Paris Agreement) in reputational risk materiality assessment • We have also developed the capability to calculate temperature alignment and transition readiness scores at individual client level for corporate clients across all sectors

⁹ <https://www.sc.com/en/sustainability/position-statements/>

“Climate change and the urgency to act has become an increasing concern for most individuals. The financial sector has a role to play in addressing this shared global challenge and is expected to act responsibly, limiting its negative impact in relation to activities that may contribute to accelerating global warming.”

Compliance risk

We consider compliance risk as the potential for penalties or loss to Standard Chartered or for an adverse impact to our clients, stakeholders or to the integrity of the markets we operate in through a failure on our part to comply with laws or regulations.

Regulators across the globe are sharpening their focus on how banks manage and disclose their climate risks. This is the case for our home regulator, the Bank of England (BOE), and for local regulators across our footprint markets. Below are some examples of existing regulations, failure to deliver on which poses a compliance risk:

- 1) The BOEs Supervisory Statement 3/19 – delivering on our Climate Risk Workplan submitted to the PRA in order to meet its expectations on preparing to manage the financial risks from climate change
- 2) Delivering the BOE’s 2021 BES on the financial risks from climate change
- 3) Emerging local regulatory requirements such as the Hong Kong Monetary Authorities pilot stress test on climate risk and the Monetary Authority of Singapore’s Environmental Risk Management guidelines

While climate risk regulations are relatively recent, in 2020 we leveraged the existing controls in place to manage the wide range of regulations that the banking industry is subject to. Below provides a summary of how we manage climate-related compliance risks.

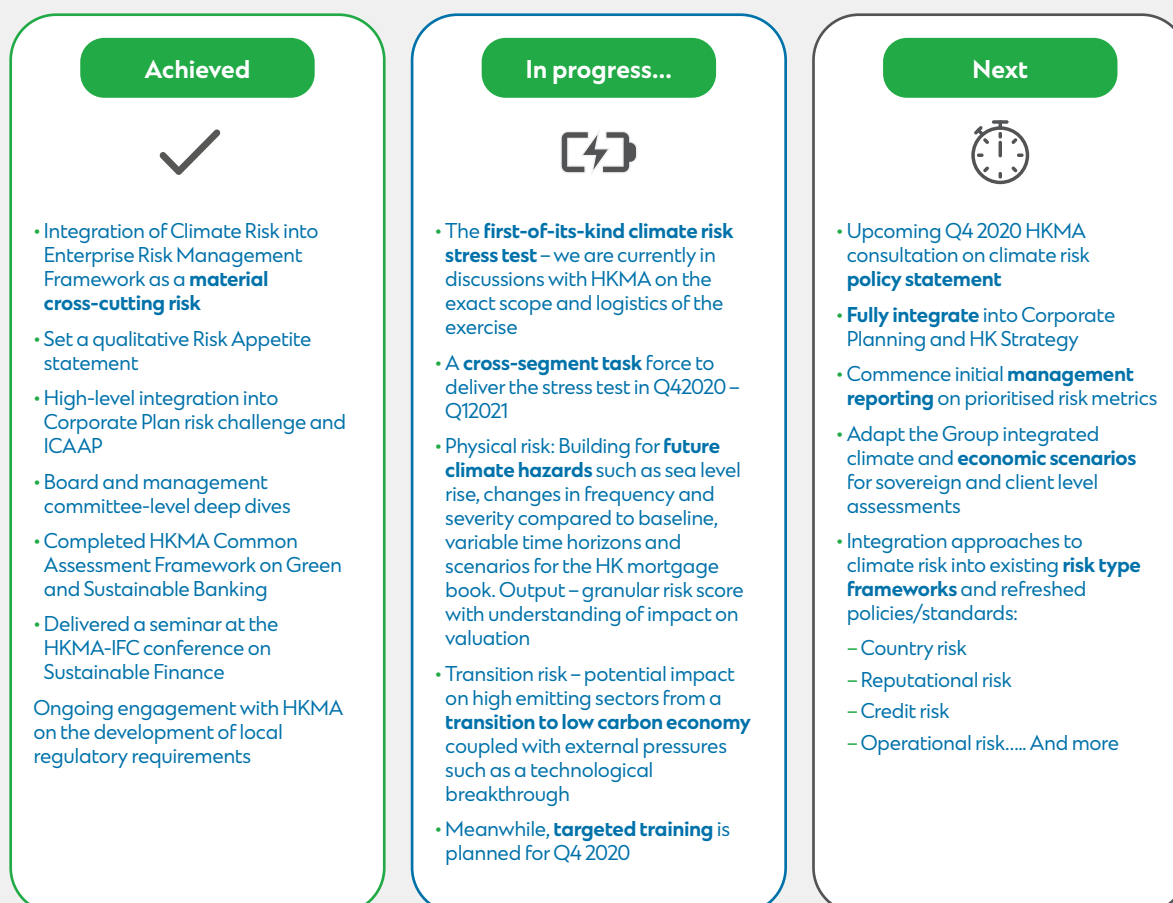
Figure 51: Compliance risk/climate risk transmission channels, existing inherent controls and additional climate risk actions

Potential climate risk drivers	Examples of impact due to climate risk regulations	Existing compliance risk mitigation measures in place which inherently address climate risk	Additional climate risk-specific mitigation actions being undertaken
Failure to deliver against increasing climate risk-related regulations from Group and local regulators	<ul style="list-style-type: none"> • Failure to identify or track progress against regulatory requirements leading to regulatory penalties and censure • Heavily fragmented local regulatory requirements leading to resource stretch and working in silos without a consistent approach 	<ul style="list-style-type: none"> • The Compliance Risk Type Framework (RTF) sets out defined roles and responsibilities for relevant Risk Framework Owners and the Compliance team regarding identification and roll out for Group and local regulatory requirements • Established process and standards for managing regulatory change • Regional and country Compliance heads report to the relevant risk committees on status of regulatory developments • Regional and country Chief Risk Officers (CROs) typically provide oversight on progress against mainstream risk-related regulations 	<ul style="list-style-type: none"> • In 2020, the responsibility for identifying new climate risk regulations was formally assigned to Group and Country Compliance teams; this is tracked through the relevant obligation management processes • At the Group level, the Global Head, Enterprise Risk Management provides day-to-day oversight on progress against BOE requirements; and progress is tracked at the Group Risk Committee through monthly Group CRO reports (including any significant delay or matters for escalation). The central climate risk team has been resourced (including investment for tools and partnership) to execute on the BOE requirements • At a regional level, Regional Chief Risk Officers (CROs) and at a country level, Country CROs are responsible for oversight on progress against climate risk regulations. Local activities with regards to climate risk roll-out are executed by local resources, supported by the tools and approaches developed at the Group for consistency • Guidance for country level (for prioritised countries with local climate risk requirements) and region level have been provided to Country and Regional CROs. Over 2021, country and regional roll-out will be strengthened by provision of climate risk management information reports covering relevant metrics, facilitating stronger oversight of risk profile at the regional and country risk committees

Case study 11

Responding to regulatory requirements and expectations on climate risk across the globe – example from Hong Kong

Sustainability and related risks are one of the top priorities at the Hong Kong Monetary Authority (HKMA). We are actively engaged with the HKMA on climate risk and the Common Assessment Framework on Green and Sustainable Banking. Led by our local Risk team, Hong Kong has already adopted the Group-level climate risk workplan into a country-level workplan and has started working on the inaugural pilot climate risk stress test from the HKMA. The material below is an example from the Greater China and North Asia (GCNA) Regional Risk Committee meeting in August 2020, which demonstrates the approach in Hong Kong.



Traded risk

Traded risk is defined as the potential for loss resulting from activities undertaken by the Group in financial markets. This definition includes market risk and the other risk sub-types such as counterparty credit risk, issuer risk, credit and other valuation adjustments, algorithmic trading and pension risk.

From a RWA perspective, traded risk's contribution to the overall Group RWA is relatively less significant than that of credit risk. Also, the majority of the exposures are short dated and/or held in liquid instruments in order to meet regulatory requirements.

Given the short-term nature of traded risks and the longer-term nature of climate risk, integrating climate risk into traded risk management is inherently challenging. Nonetheless, throughout 2021 we will explore effective ways to integrate climate risk into relevant traded risk management processes and activities, including scenario analysis and capital adequacy assessment.

Figure 52: Traded risk/climate risk transmission channels, existing inherent controls and additional climate risk actions

Potential climate risk drivers	Examples of impact due to climate risk and/or regulations	Existing traded risk mitigation measures in place which inherently address climate risk	Additional climate risk-specific mitigation actions being undertaken
Acute physical risk events or an extremely disruptive transition can cause sudden changes in the fair value of assets	<ul style="list-style-type: none"> Physical risk of extreme severity and intensity can impact market risk if they lead to a large drop in the prices of risky financial and commodity assets because of widespread destruction of assets and productive capacity or a drop in demand for their products Potential impact of carbon pricing, carbon tax in an orderly/disorderly transition on global commodity prices Potential impact of increased asset stranding on fossil fuel energy sector and revaluation of assets for other carbon intensive sectors leading to fire sales and debt deflation 	<ul style="list-style-type: none"> Market risk exposures are monitored daily against approved limits Various types of forward-looking stress scenarios are used in order to reflect the nature of positions as well as anticipated market developments. Some of these scenarios, particularly based on commodity price correction (such as oil price decline) or implementation of carbon taxes could be driven by climate risk The traded book risk appetite ensures market risk losses are contained on a daily basis as well as under stress situations All fair value positions held within the trading book are marked-to-market (MTM) on a daily basis Disruptive transition scenarios for climate risk are generally played out over a 5-year period, which allows sufficient time to adjust trading positions 	<ul style="list-style-type: none"> Over 2021, the Group has a key workplan item to drive integration of climate risk with the relevant traded risk management framework One area of integration will involve how existing stress scenarios and risk management levers could be expanded to cover potential shocks in the prices of financial assets or commodity prices driven by a climate-related physical or transition risk shock

Capital and liquidity risk

Capital risk is defined as the potential for insufficient level, composition or distribution of capital to support our normal activities.

Robust capital management is at the core of banking regulations and activities, to ensure we have sufficient loss-absorbing capacity to withstand severe but plausible economic shocks. As such, there are established processes for assessing capital adequacy through a number of regulatory and internal stress tests, including necessary management actions to stay within the Board-approved risk appetite and regulatory minimum requirements. The ICAAP is the mainstream capital adequacy assessment process in which climate risk considerations are already integrated. This is run annually to strict internal governance including Board oversight, and the results are reviewed by the regulators.

As described in the individual PRT sections, climate risk can impact capital adequacy through any of the impacted risk types. For most of the financial risk types, we have already conducted some top-down analysis to demonstrate that our existing capital protects against severe but plausible climate-related stress in the short to medium term. Over 2021, we will seek to enhance the analysis with more granular and quantitative insights over longer time horizons and broader coverage and continue to take necessary management actions as part of the established processes. The regulatory stress tests planned over 2021, including the 2021 BES, will also help strengthen our understanding of capital adequacy in the context of climate risk.

5.

Introduction

1. Governance

2. Strategy

3. Climate risk toolkit

4. Risk

5. Metrics and Targets

6. Appendices



Metrics and Targets

- 66 Metrics and Targets
- 66 Metrics to accelerate sustainable finance
- 67 Metrics to reduce our direct and financed emissions
- 73 Managing the financial risk from climate change

Metrics and Targets

As noted throughout the document, we set a range of external commitments and targets on climate-related issues, most notably through our Sustainability Aspirations – a suite of measurable targets aligned to the UN SDGs. Overseen by the Sustainability Forum and owned by senior leaders in respective businesses and functions, our Sustainability Aspirations focus on the areas in which we can have the most positive and material impact on sustainable development through our core business in our markets in the short to medium term.

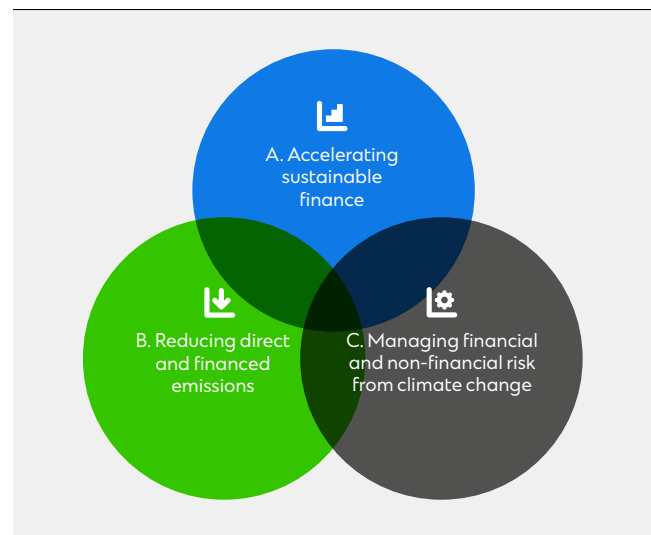
In addition to those set out in this document, the full suite of Aspirations, and detail of our progress against these, can found in our 2020 Sustainability Summary at sc.com/sustainabilitysummary.

Considering metrics in line with the three pillars of our climate change approach:

A. Accelerating sustainable finance by supporting the net zero transition (e.g. renewable energy) and building resilience to physical climate risks (e.g. adaptation infrastructure), providing finance in the locations most vulnerable to, and least prepared for climate risk

B. Reducing our direct and financed emissions in alignment with the Paris Agreement goal to limit global warming to below two degrees

C. Managing the financial risk from climate change by developing the ability to systematically identify and assess climate risk and building this into our mainstream risk management practices and governance



A. Metrics to accelerate sustainable finance

Figure 53: 2020 Sustainability Aspirations: Sustainable Finance

Aspiration	Target	Target date	Status	Progress
Infrastructure				
Everyone should have access to safe, reliable and affordable power and infrastructure which transforms lives and strengthens economies.	Facilitate project financing services for \$40 billion of infrastructure projects that promote sustainable development that align to our verified Green and Sustainable Product Framework	Jan 2020 – Dec 2024	Not on track	2020: USD2.4 billion
Climate change				
Climate change is one of today's greatest challenges and addressing it is essential to promote sustainable economic growth.	Facilitate \$35 billion worth of project financing services, M&A advisory, debt structuring, transaction banking and lending services for renewable energy that align to our verified Green and Sustainable Product Framework	Jan 2020 – Dec 2024	On track	2020: USD18.4 billion

The COVID-19 pandemic impacted the pace of delivering three new Aspirations set in 2020 focused on infrastructure, microfinance and retail. These Aspirations underpin sustainable development and we remain committed to progressing these targets in 2021. More detail on all Aspirations can be found at sc.com/sustainabilitysummary

“Our Sustainability Aspirations play a key role in setting our targets to guide our approach.”



B. Metrics to reduce our direct and financed emissions

Full details of the principles and methodology that the Group uses to report all direct carbon emissions can be found at [sc.com/environmentcriteria](https://www.sc.com/environmentcriteria), and the verification statement provided by our independent auditors at [sc.com/environmentalassurance](https://www.sc.com/environmentalassurance).

The Group's GHG emissions are defined as follows:

Scope 1 emissions are defined as arising from the consumption of energy from direct sources, during the use of property occupied by the Group. On-site combustion of fuels including diesel, liquefied petroleum gas (LPG) and natural gas, is recorded using meters, or where metering is not available, collated from fuel vendors' invoices. Emissions from the combustion of fuel in Group-operated transportation devices, as well as fugitive emissions, are excluded as being immaterial.

Scope 2 emissions are defined as arising from the consumption of indirect sources of energy, during the use of property occupied by the Group. Energy generated off-site in the form of purchased electricity, heat, steam or cooling, is collected as kilowatt hours consumed using meters or where metering is not available, collated from vendors' invoices.

Applicable to both Scope 1 and 2 emissions, for the purpose of relevancy, at leased properties we include all indirect and direct sources of energy consumed by building services (among other activities) within the space occupied by the Group. This can include base building services under landlord control, but over which we typically hold a reasonable degree of influence.

All data centre facilities with conditioning systems and hardware remaining under the operational control of the Group are included in the reporting. This does not include energy used at outsourced data centre facilities which are captured under Scope 3.

Scope 3 emissions are defined as occurring as a consequence of the Group's activities but arising from sources not controlled by us. Business air travel data is collected as person kilometres travelled by seating class, by employees of the Group. Data is drawn from country operations that have processes in place to gather accurate employee air travel data from travel management companies. Flights are categorised between short haul and international trips.

Emissions from other potential Scope 3 sources such as electricity transmission and distribution line losses are not currently accounted for on the basis that they cannot be calculated with an acceptable level of reliability or consistency. We do however capture Scope 3 emissions from outsourced data centres managed by third parties.

Tracking emissions over time

The Group's environmental targets have traditionally been set in terms of resource intensity rather than carbon emissions. However, in 2020 we started to track Scope 1 and Scope 2 emissions against a 2019 base year. The Group has also voluntarily reported GHG emissions for all years back to 2010, allowing an overview of changes within our GHG inventory over time. We will be using the most recent Defra and IEA conversion factors for the current and future years' reporting.

For Scope 3 emissions, the Group measures the impact from business air travel exclusively in terms of carbon emissions. For 2019 reporting we have provided emissions inclusive of radiative forcing and distance uplift in accordance with UK Government guidance and provided equivalent figures for 2017 and 2018 reporting years using the conversion factors appropriate for those reporting periods.

In addition to updates to conversion factors, the Group also recognises that restatements may be required to ensure a consistent and accurate account of emissions over time. Such cases might be as a result of significant structural changes (i.e. acquisitions, divestments and mergers), adjustments to our reporting criteria and improvements to accuracy. In exceptional circumstances, the discovery of previous errors that have a material impact on reported emissions may also justify restatements.

Financed emissions and Paris Alignment for the lending portfolio

Measuring financed emissions across a range of asset classes remains an industry-wide challenge. One of our core strategic focus areas has been to measure the impact of our financing on climate change and ultimately reduce it in line with the goals of the Paris Agreement. To this end, we have and continue to contribute to industry-wide solutions, as noted in our 'Emissions White Paper' published in 2019. Over 2020, we also built significant data sourcing and modelling capabilities to measure the alignment of our portfolio internally, recognising the urgency to act and our role in contributing to developing best practice. We acknowledge that there is not yet a perfect solution to the problem, but we remain committed to supporting industry-wide efforts while also enhancing our own capabilities in response to the challenge.

We welcome and applaud the thought leadership provided by the Paris Agreement Capital Transition Assessment (PACTA) methodology, which has been one of the founding blocks in developing our understanding of climate scenarios and bottom up approach to understanding the direction of travel in a low carbon transition. We disclosed emissions intensities of our automobile manufacturing and cement portfolios using the PACTA methodology and committed to review the data in more detail in 2020, while exploring the rapidly evolving available methodologies to measure our portfolio's alignment to the goals of the Paris Agreement, in a way that helps us drive the transition where it matters most. To this end, we have explored the temperature alignment metric in more detail over 2020, and found it to be a useful tool on the following grounds:

- **Broader coverage of portfolio:** While we agree that most material areas of emissions need to be prioritised for reduction, we acknowledge that the need to transition spans across all sectors. Our approach to temperature alignment measurement allows us to broaden the coverage from the high-carbon sectors to many other sectors which are linked to our financing, thereby allowing us to deliver on our overall portfolio alignment commitment more meaningfully. We demonstrate the increasing coverage of portfolio through Figure 59 on page 72.
- **Differentiated transition pathways and consistency with risk metrics:** Our transition risk assessment is grounded on various regional and sectoral decarbonisation pathways. Using the same set of data and analytics to measure our portfolio's climate alignment and risk metrics makes it easier to drive consistency and level of awareness across the

organisation and our clients, and thereby improve the quality of engagement with our clients. As Figure 59 demonstrates, sectors such as consumer durables which are not perceived to be high carbon are also required to decarbonise as their current emissions intensities (and consequent temperature alignment) are not aligned to the goals of the Paris Agreement.




- **Ease of interpretation and comparability:** Temperature alignment is easier to interpret and benchmark than sector-specific metrics which are often in different units; for example, emissions intensities by tonnes of cement produced and per passenger kilometre are inherently difficult to compare between clients across sectors. Sector-specific approaches are integrated into temperature alignment calculation as noted in Figure 70 on page 84, so it provides for easier comparability within and between sectors while capturing the sector-specific nuances in the underlying calculations.
- **Data accuracy and time horizon:** Our temperature alignment calculation is based on client-disclosed emissions and production data and contains projections out to 2030, and potentially extendable further into the future. This facilitates greater ease of client engagement, which is critical to drive the necessary changes in the real economy while avoiding the unintended consequence of withdrawing capital away from sectors or clients who may have high emissions currently, but are taking the right actions to decarbonise their business models.

“Our Sustainability Aspirations play a key role in setting our targets to guide our approach.”

Our own operations

Targets:

Figure 54: 2020 Sustainability Aspirations: Our own operations

Aspiration	Target	Target date	Status	Progress
Environment				
Reducing our own impact on the environment will protect our planet for the benefit of our communities   	Reduce annual greenhouse gas emissions (Scope 1 and 2) to net zero by 2030 with an interim target: Dec 2025: 60,000 tCO ₂ e	Jan 2019 – Dec 2030	On track	2020: 117,859 tCO ₂ e 2019: 146,313 tCO ₂ e
	Source all energy from renewable sources	Jan 2020 – Dec 2030	On track	2020: 7.4% sourced
	Introduce an emissions offset programme for Scope 3 travel emissions	Jan 2020 – Dec 2020	Achieved	
	Join the Climate Group ‘RE100’	Jan 2020 – Dec 2020	Not achieved	RE100 was closed to new financial sector participants while they reviewed their entry criteria in 2020. We are committed to joining in 2021.
	Reduce annual office paper use by 57% to 10kg/FTE/year	Jan 2012 – Dec 2020	Not achieved	2020: 11.20 kg/FTE/year 2019: 16.96 kg/FTE/year
	Reduce waste by 50% per colleague to 40kg/FTE/year	Jan 2020 – Dec 2025	On track	2020: 64 kg/FTE/year
	Recycle 90% of waste	Jan 2020 – Dec 2025	Not on track	2020: 23% recycled

For more information on performance against our aspirations, please see our Sustainability Summary at sc.com/sustainabilitysummary.

Metrics:

We comply with ISO14064 for recording consumption data and then convert to GHG metrics using the IEA emission factors, published each year. As well as accounting in absolute terms, the Group uses a range of intensity ratios to report emissions relative to a normalising denominator, enabling performance to be tracked over time on a ‘like-for-like’ basis.




Figure 55: GHG emissions from direct operations

Indicator	2020	2019	2018	Unit
Scope 1 emissions (combustion of fuels)	3,988	4,542	8,584	tonnes CO ₂ eq/year
Scope 2 emissions (purchased electricity) – location-based method	113,870	141,771	139,366	tonnes CO ₂ eq/year
Total Scope 1 & 2 emissions	117,858	146,313	147,950	tonnes CO₂ eq/year

In our supply chain

Targets:

Figure 56: 2020 Sustainability Aspirations: our supply chain

Aspiration	Target	Target date	Status	Progress
Environment				
Reducing our own impact on the environment will protect our planet for the benefit of our communities   	Reduce our Scope 3 value chain emissions from business travel by 7%	Jan 2020 – Dec 2020	Achieved	2020: 63.9% reduction
	Introduce an emissions offset programme for Scope 3 travel emissions	Jan 2020 – Dec 2020	Achieved	

Metrics:

Figure 57: Scope 3 emissions

Indicator	2020	2019	2018	Unit
Scope 3 emissions with distance uplift (air travel)	33,811	94,043	121,464	tonnes CO ₂ eq/year
Scope 3 emissions (outsourced data centre)	29,562	46,362	21,523	tonnes CO ₂ eq/year
Total Scope 1, 2 & 3 emissions	181,231	286,718	290,937	tonnes CO₂ eq/year
Employees (FTE)	83,657	84,398	85,402	tonnes CO ₂ eq/year
Emissions per employee	2.17	3.40	3.41	tonnes CO ₂ eq/FTE

Targets:

Figure 58: 2020 Sustainability Aspirations: our clients

Aspiration	Target	Target date	Status	Progress
Climate change				
Climate change is one of today's greatest challenges and addressing it is essential to promote sustainable economic growth.   	Develop a methodology to measure, manage and ultimately reduce the CO ₂ emissions from the activities we finance	Jan 2019 – Dec 2020	Achieved	After our coal-dependent client review during 2020, four clients across our portfolio were identified as 100 per cent dependent on thermal coal. We have ceased new business with all four clients and are exiting these relationships subject to any outstanding contractual arrangements.
	Only provide financial services to clients who are:	Jan 2020 – Jan 2030	On track	
	By Jan 2021, less than 100% dependent on earnings from thermal coal (based on % EBITDA at group level)			
	By Jan 2025, less than 60% dependent on earnings from thermal coal (based on % EBITDA at group level)			
	By Jan 2027, less than 40% dependent on earnings from thermal coal (based on % EBITDA at group level)			
	By Jan 2030, less than 10% dependent on earnings from thermal coal (based on % EBITDA at group level)			

Metrics:

Figure 59 demonstrates the broader coverage and comparability that the temperature alignment metric facilitates, by taking into account different decarbonisation rates across various sectors and regions. This covers 100 Clients. For net nominal exposure and regions included in the coverage please see Appendix 6. A few key points to note in interpreting the results:

- Temperature alignment is an emerging concept, and industry-wide standard on the methodology is still evolving. We fully expect our approach to evolve in line with best practice.
- The results should be noted with the methodology, limitations (see page 35 and future development roadmap Figure 70).
- In our 2019 TCFD report, we had included baseline emissions intensities for Cement and Automobile manufacturing portfolios using the PACTA methodology. In the sample of clients in scope for Figure 59, we have included those sectors for comparability and continuity while broadening scope to other sectors (including sectors not generally identified as high carbon).
- The 100 corporate clients in scope for this analysis from the same sample as the one used in PD assessment above and informed by the same underlying variables. This is an important enabler for driving consistency between transition risk metrics (prudential) metrics and portfolio alignment (strategic) metrics.
- For this sample of 100 clients, simple average temperature alignment is 3.3°C whereas exposure weighted average temperature alignment is 3.14°C. Overall average of 3.14°C indicates that our portfolio is largely in line with the current global emissions and temperature trajectory.
- Our current focus is on expanding the coverage of analysis, engaging with clients with the results to understand their transition plans better and support our clients in decarbonising their business model through a range of sustainable financing solutions and transition frameworks.

Figure 59: Initial temperature alignment based on a sample of clients

Industry category	Number of clients	Weighted average temperature alignment projected at 2030 (in degrees Celsius)
Construction	16	3.36
Consumer Durables & Apparel	20	2.54
CRE	20	3.21
Energy	21	3.45
Manufacturing – Automobiles and Components	16	3.08
Manufacturing – Cement	7	2.27
Total	100	3.14

Exposure to high-carbon sectors

Exposure numbers provided here are loans and advances in USD millions. Closed transactions include both financial and advisory transactions.

As we noted in our 2019 report, exposures to specific ISIC codes may not be an optimal way to understand a financial institution's alignment to climate goals or the financial risks it faces from climate change. Granular bottom-up analysis is required to assess those as we have presented throughout this document. Our existing classification system does not capture the nature of the transactions explicitly, e.g. part of the new exposure to the power generation sector may be to companies predominantly operating in renewable energy or sustainable finance transactions (for example sustainability linked facilities) to decarbonise current operations of utility companies. We welcome the efforts on establishing a clear taxonomy (such as the EU taxonomy) to classify 'greenness' of transactions. Once the transition finance taxonomy is implemented in Standard Chartered, we will be able to report these more meaningfully as high-level measures, noting that measurement of risk and climate alignment should still be driven by a bottom-up granular approach.

Figure 60: Exposure to high-carbon sectors – loans and advances (USD m)

Sector	ISIC(s)	2020	2019	2018	Percentage of loans and advances with <1yr maturity (2020)	# Closed transactions 2020
Automotive	3853	3,842	3,536	2,464	65%	1
Cement	3640, 3650	1,108	1,096	1,094	57%	6
Steel	3710	2,240	2,815	2,097	73%	3
Coal	2100	181	302	284	38%	0
Oil & Gas	2200, 2201, 2202, 2203	4,718	4,376	5,509	46%	24
Power	4010	4,226	4,092	4,128	34%	36
Shipping	Based on internal tagging	5,110	5,103	4,890	11%	63
Aviation	7131	3,733	2,388	2,620	13%	17

Transactions refers to the provision of services to a client in relation to a Project or Asset, governed by a specific agreement with that client, including advisory services.

*In 2018 we reported figures up to September due to the 2018 TCFD publication date being earlier. From 2019 figures are to year end.



C. Managing the financial risk from climate change

Credit risk

A. CCIB

Our approach to transition risk assessment is granular and data-led, covering a broad range of sectors (i.e. not restricted to only high-carbon sectors) and at a company level where data supports. We have provided initial results covering both orderly and disorderly transition scenarios for 100 clients across a range of sectors. For a breakdown by region and net nominal exposure please see Appendix 6. A few key points to note in interpreting the results:

- Our current risk measurement and metrics capture the potential impact to clients' financials under different transition scenarios and should be read in context of the methodology and limitations discussed on pages 24 to 27.
- The PD changes do not factor in additional mitigation actions clients (and the Group) may and will take over the next 30 years, which implies the results can only be viewed as a gross risk measure. The results indicate a 'what if' analysis, and not a 'what is likely to happen' view. In reality, as climate action increases globally, clients, sovereigns and banks are likely to take additional mitigation measures to manage transition risks better. A 30-year time period inherently brings challenges around forecasting likely outcomes, due to the uncertainties associated with breakthrough technological developments, sovereign policies and management response (both by the Group and our clients) to evolving risk profile.
- As discussed in section A1 on page 44, we have developed a robust framework to assess the quality of mitigation plans at a client level and are in the process of engaging with our clients to validate existing data and gather more information. Clients' transition readiness is key complementary information to consider in client engagement and decision-making processes.
- We are also working on building transition frameworks for the high-carbon sectors alongside innovative sustainable finance solutions, to help our clients in their decarbonisation journey.
- The initial results demonstrate the need to drive an orderly transition. Exposure weighted average PD increases from 0.5 per cent in 2019 to 2.8 per cent in 2050 (i.e. c. 230 bps increase) in an orderly transition, but the impact of a disruptive transition could be significantly more severe with average PD by 2050 potentially reaching 7.4 per cent (c. 700 bps increase).
- In an orderly transition scenario, PDs worsen slowly until 2040, post which carbon tax approaches the USD 300 mark and the most material impacts are observed. Unsurprisingly, the energy sector appears to be more sensitive to carbon prices and changing demand curves in a low-carbon transition, with PDs showing a stronger upward trend than other sectors by 2035. In a disorderly scenario, with late onset but sharp increase in carbon price, some severe potential PD movements are observed across all sectors around 2045, and a very steep rise by 2050 (with carbon price approaching USD 600).
- Our current focus is expanding the scope of the analysis, and leveraging the analysis together with our deep understanding of local markets and sustainable finance solutions to meaningfully engage with our clients. Driving an orderly transition will be critical to avoid the worst financial impacts of both physical and transition risks.

Results are expressed in terms of exposure weighted average probability of default (WA PD).

Figure 61: Initial assessment of financial impact of an orderly transition based on a sample of clients

Orderly transition	# clients	WA PD						
		2019	2025	2030	2035	2040	2045	2050
Construction	16	0.4%	0.4%	0.5%	0.5%	0.6%	0.9%	1.6%
Consumer Durables & Apparel	20	0.5%	0.5%	0.6%	0.6%	1.3%	1.6%	1.7%
CRE	20	0.3%	0.3%	0.4%	0.4%	0.4%	0.7%	1.1%
Energy	21	0.7%	0.8%	0.8%	1.2%	2.5%	3.9%	8.3%
Manufacturing – Automobiles and Components	16	0.3%	0.3%	0.3%	0.4%	0.6%	2.3%	2.4%
Manufacturing – Cement	7	1.2%	1.3%	1.4%	1.4%	1.6%	2.5%	4.5%
Grand total	100	0.5%	0.5%	0.5%	0.6%	1.0%	1.7%	2.8%

B. CPBB

We have assessed current and forward-looking physical risks at a property level for six markets, covering approximately 60 per cent of our total residential mortgage exposure. We have focused on the concentration of ‘extreme’ risks to capture the tail risks in the portfolio instead of describing averages, although we acknowledge the inherent modeling uncertainty in the results (which is expected to improve over time with advancement in climate science). While we disclose examples of initial gross risk results in this report, this is an evolving area and we fully expect to refine our approach and understanding on quantification of such risks. A few key points to note in interpreting the results:

- Our current risk measurement and metrics capture the gross risk exposure and should be read in context of the limitations discussed on page 32.
- The results do not factor in existing adaptation measures, governmental policies and regulations and their response management, structural (engineering related, e.g. recency and quality of construction, availability of basement, technological advancement, flood defences and dams protecting the property) or financial (insurance coverage or the degree to which such physical risks may be factored into the property valuation). Structural adaptation measures may also include actions taken by real estate developers and adaptation investment by governments, for example:
 - Real estate developers and building managements in Hong Kong periodically review and assess if their facade systems are prepared to manage typhoons that frequently impact the region. The Hong Kong Institution of Engineers ensures buildings follow a code of practice designed to make sure skyscrapers are safe in strong tropical storms such as Typhoon Mangkhut.
 - The Singapore Government is ensuring that all new housing development buildings are built three meters above sea level and that becomes an inherent adaptation measure from future sea-level rise and flood risks. Additionally, to cater for long-term sea-level rise, the minimum land reclamation level in Singapore was raised from three to four metres above the mean sea level.
- For Taiwan, the country falls under the high seasonal tropical wind speed zone which is inherent to the region and not specific to our mortgage portfolio. In future, we will explore further granularity in the risk scores to be able to differentiate further in such cases.
- Over time, sovereigns and policymakers are expected to drive market trends such as investment in adaptation financing, technological advancements, innovative risk transfer and mitigation approaches to combat the potential impacts of climate change.
- Our current focus is on integrating such metrics in mainstream risk reporting, expanding the coverage and strengthening the analysis to further differentiate risk profiles, and integrating explicit consideration of physical risks into the mainstream risk management and governance processes.

Figure 62: Initial assessment of gross physical risk profile for retail mortgages

Physical risk type	Singapore	Malaysia	India	Indonesia	Taiwan	Korea
Extreme flood risk	2%	7%	21%	23%	11%	13%
Extreme wildfire risk	0%	0%	0%	0%	0%	0%
Extreme storm risk	0%	0%	2%	0%	100%	8%
Extreme sea-level rise (RCP 8.5, by 2100)	0%	0%	1%	2%	2%	1%

Operational risk

Standard Chartered's own operations

We analysed more than 1,000 of our operating locations to assess the gross physical risk profile. Results shown in Figure 63 should be read in the context of the methodology and limitations discussed on pages 30-32, and our approach to assessing climate risk from an operational risk perspective (see pages 52 to 55).

Having completed the initial assessment, our current focus is on periodically monitoring the risk profile and assess adequacy of adaptation actions, and ensuring new acquisitions explicitly consider the exposure to physical risks and proportionate adaptation plans.

Figure 63: Initial assessment of gross physical risk profile for our offices and branches

Physical risk	Operating locations exposed to extreme physical risk (%)				
	Group	ASA	GCNA	AME	EA
Extreme flood risk	19%	17%	24%	11%	25%
Extreme wildfire risk	1%	0%	0%	2%	0%
Extreme storm risk	20%	3%	43%	0%	0%
Extreme sea-level rise (RCP 8.5, by 2100)	2%	0%	2%	4%	4%

Country risk

Refer to Figures 47 and 49 (on pages 57 and 59 respectively) for physical and transition risk related concentration metrics relevant to country risk.

In addition, we also analysed the extent of net zero commitments across our markets. The majority of our exposure currently is to countries that have not yet made a net zero commitment, which underlines the challenges as well as the opportunities associated with driving a low-carbon transition in our unique footprint. Despite the challenges, we are committed to working together with our clients and governments to raise awareness of the issues related to climate change, and drive an orderly low carbon transition.

Figure 64: Sovereigns with net zero commitment across our markets

Sovereigns with net zero commitment	% Gross country risk exposure (of region)
GCNA	59%
ASA	0.1%
AME	6%
EA	52%
Total (Group level)	40%

Approvals

This report was approved by:



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Appendices

80	Appendices
80	Appendix 1
81	Appendix 2
84	Appendix 3
85	Appendix 4
86	Appendix 5
87	Appendix 6

Appendix 1: Platforms and initiatives

Figure 65: Platforms and initiatives Standard Chartered participates in

Platform	Objectives and progress
United Nations Environment Programme for Financial Institutions (UNEP-FI): TCFD Pilot 	<p>We participated in the 'Phase 1' TCFD pilot during 2017 and 2018, and contributed to the summary reports 'Extending our Horizons' on transition risk and 'Navigating a New Climate' on physical risk.</p> <p>Since mid-2019, we have been participating in the 'Phase 2' TCFD pilot alongside a larger group of 29 banks.</p>
United Nations Environment Programme for Financial Institutions (UNEP-FI): Climate Resilience Risks and Opportunities Coalition	<p>Part of a leadership group who commit to disclose physical risks and opportunities and build support for public policies to encourage climate-related physical risk disclosure across the financial sector.</p>
Katowice Commitment	<p>In December 2018, we came together with four international banks to sign the Katowice Commitment, pledging to align lending portfolios with global climate goals.</p> <p>We worked closely with Katowice Commitment signatory banks in 2019 and 2020.</p> <p>Our collaboration has aided our piloting of the 2 Degrees Investing Initiative Paris Agreement Capital Transition Assessment (PACTA) tool.</p>
Science Based Targets Initiative (SBTI) 	<p>In 2018, we set Science Based Targets for our own organisation footprint ('Scope 1' and 'Scope 2') to become net zero by 2030.</p> <p>Recognising that the emissions enabled by our financing are orders of magnitude greater than those from our own operations, we also joined the Financial Institutions' 'Expert Advisory Group', which we continue to participate in.</p>
United Nations Environment Programme for Financial Institutions (UNEP-FI): Collective Commitment to Climate Action 	<p>Building on the commitments we had made in September 2018 to "measure, manage and ultimately reduce the emissions related to its activities and those related to the financing of its clients" and our participation in the Katowice Commitment, in September 2019 we signed the Collective Commitment to Climate Action.</p> <p>This brings together 38 banks to further drive action. We contributed to a CCCA collective progress report released in December 2020, and continue to work on standardised principles for climate action.</p>
Coalition for Climate Resilient Investment	<p>In September 2019, we joined the Coalition. This seeks to bring together over 30 organisations across the investment value chain to address climate resilience challenges.</p>
University of Cambridge Banking Environment Initiative (BEI) Client Engagement Tool 	<p>Building on our longstanding participation in the BEI and 2019's launch of the Bank 2030 report, during 2020 we participated alongside fellow BEI banks in the development of a client engagement tool to support the climate transition, which will be finalised and released in 2021.</p>
PRA and FCA's joint Climate Financial Risk Forum: Risk Management Working Group 	<p>We are a member of the Risk Management Working Group, which is aiming to produce a practical handbook for climate risk management by Q1 2021. We are leading the Frameworks and Governance section of the handbook. In 2020 we were appointed to the Disclosures Working Group.</p>



We also work on climate-related topics as part of our involvement with banking sector trade associations. Key memberships include the Institute for International Finance (IIF), Association for Financial Markets in Europe (AFME) and European Banking Federation (EBF).

We are seeing, and contributing to, growing dialogue across our footprint on climate risk. During the past year we have participated in dialogue with a wide range of regulators and regulatory platforms. This included responding to the European Commission's consultation on a Renewed Sustainable Finance Strategy, the Monetary Authority of Singapore's consultation on Guidelines on Environmental Risk Management for Banks, the Dubai Financial Services Authority discussion paper on Championing Sustainable Finance in the DIFC, and the Hong Kong Monetary Authority white paper on Green and Sustainable Banking. Key international regulatory platforms include the central banks and regulators' Network for Greening the Financial System ('NGFS') and the International Organisation of Securities Commissions ('IOSCO').

Appendix 2: background and introduction of climate-related scenario analysis

For scenario analysis to be successful, it is critical to consider the full range of plausible situations, from the best case to the worst. A scenario is defined as the evolution of relevant metrics and policies leading to a particular outcome. Scenarios are not intended to fully predict the future, but rather to highlight central elements of a potential future under limited, but key, assumptions. They are expected to vary from business-as-usual to paradigm shifting, but each should be plausible, distinct, consistent, relevant and challenging.

Due to the forward-looking nature of climate change, and because the severity and speed of its impacts will depend on the actions that governments, businesses and individuals take now, it is essential that assessments use a range of possible time horizons and global temperature warming situations; and are considered for both transition and physical risks.

Transition risk scenarios typically use assumptions focused on government policies; for example, actions to be taken along with the availability and deployment of technologies to limit emissions to a certain target. Using complex models known as Integrated Assessment Models (IAMs), outputs from scenario analysis indicate how variables such as energy demand and supply, economic activity, macroeconomic and other socio-economic factors will evolve, based on the specified set of underlying scenario assumptions. Furthermore, specific sets of assumptions for transition risk scenarios usually surround technological advancement, timing and ambition levels of policy actions and societal preference.

Physical risk scenarios explore the impact of GHG concentration to the earth's climate and its impact on us, be it displacement of the population and economic activity due to sea-level rise, or loss of agricultural land due to increased precipitation or drought.

There are a number of scenarios published by various governmental and academic bodies but at a high level these can be thought of within three main categories for both physical and transition risk, each made up of multiple underlying scenarios. Financial institutions use these scenarios to inform their own bespoke risk assessments and they broadly follow these three possible situations.

Figure 66: Transition scenarios

1. Sudden transition	Policy actions bring about an immediate move to a low-carbon economy in order to reduce CO ₂ emission levels and limit the global mean temperature rise to below 2°C. In the scenario, this transition can happen today or after 2030. In both cases the transition is an abrupt one, and organisations have limited preparedness to adapt their operational models to the new low-carbon economy. Some climate change related physical impacts are expected to be felt, though these would be relatively constrained compared to a business-as-usual scenario.
2. Gradual transition	This scenario also seeks to limit global mean temperature rise to below 2°C using similar methods to a sudden transition, but at a more gradual pace. This means the transition begins earlier, and organisations have more time to adjust operational models and adapt to the new low-carbon economy. This is the most desired scenario and includes limited and well-managed physical and transition risk.
3. Business-as-usual	The scenarios in these segments assume no policy actions are taken by governments and organisations to limit emissions, leading to a drastic increase in global mean temperature and thus increased extreme climate events both in terms of severity and frequency. This is the least desirable scenario.

Appendix 2 continued

Physical and transition risk climate scenarios are different than those scenarios often used in typical stress testing exercises in many ways:

- **Uncertainty:** While the typical stress testing exercises rely on a client's behaviour during hypothetical macroeconomic shocks using the models based on historical data, climate risk scenarios depend on uncertain events based on theoretical models from academic experts albeit proven with robust evidence. Due to the embedded uncertainty, the impact from extreme cases can be much larger than the typical extreme cases under macroeconomic shocks.
- **Differentiated impact:** Another key difference is how the impact of climate risk scenarios manifests for different sectors under transition risk scenarios, and for different geographies under physical risk scenarios. For example, a sudden policy change which restricts utilities companies to decrease their reliance on coal will have a much larger impact on them in comparison to other sectors such as in downstream energy consumption. Therefore, granularity of the scenarios for different sectors or geographies is much more important under climate risk scenarios.
- **Time horizon:** The impact of climate-related risks is also expected to last much longer than the typical macroeconomic shocks. Current transition risk scenarios typically span over 30 years, while for physical risk scenarios, it is expected to be unidirectional, i.e. the impact is expected to always increase or at best get stable over the next 30-80 years.

IPCC scenarios start with a range of atmospheric GHG concentrations and articulate the likely resulting temperature warming ranges.

- **Business-as-usual (RCP 8.5)** – Emissions continue rising at current rates. As likely as not to exceed 4°C.
- **Some mitigation (RCP 6.0)** – Emissions rise until 2080, then fall. Likely to exceed 2°C.
- **Strong mitigation (RCP 4.5)** – Emissions stabilise at half of today's levels by 2080. More likely to exceed 2°C.
- **Aggressive mitigation (RCP 2.6)** – Emissions halved by 2050. Not likely to exceed 2°C.

IEA follows scenarios that articulate different policy outcomes (i.e. level of temperature increase) and the energy and economic pathways that would likely result in achieving temperature increases around the desired outcome, (transition scenarios).

- The **Stated Policies Scenario (STEPS)** reflects all of today's announced policy intentions and targets, insofar as they are backed up by detailed measures for their realisation.
- The **Delayed Recovery Scenario (DRS)** is designed with the same policy assumptions as in the STEPS, but a prolonged pandemic causes lasting damage to economic prospects with the lowest rate of energy demand growth since the 1930s.
- In the **Sustainable Development Scenario (SDS)**, a surge in clean energy policies and investment puts the energy system on track to achieve sustainable energy objectives in full, including the Paris Agreement, energy access and air quality goals.
- The new **Net Zero Emissions by 2050 case (NZE2050)** includes the first detailed IEA modelling of what would be needed in the next ten years to put global CO₂ emissions on track for net zero by 2050.

Intergovernmental Panel on Climate Change (IPCC)

International Energy Agency (IEA)

Appendix 2 continued

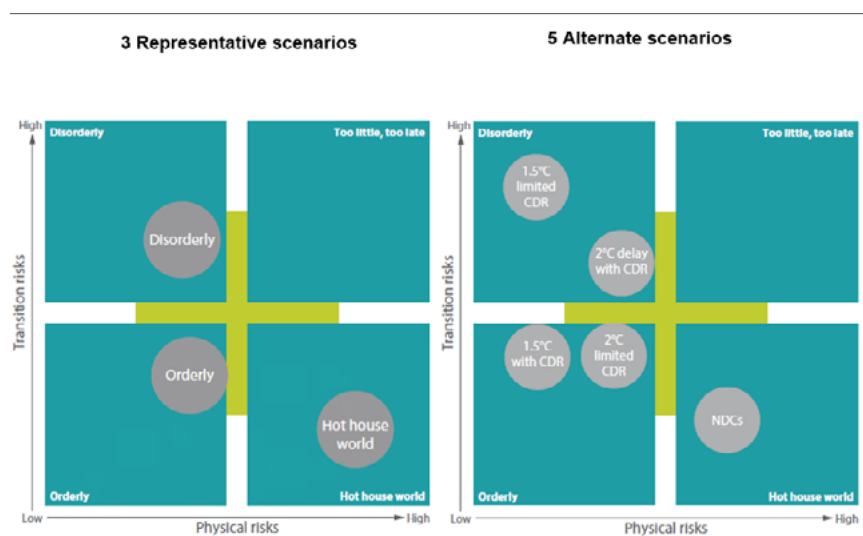
Network of Central Banks and Supervisors for Greening the Financial System (NGFS) scenarios

NGFS explores a set of eight scenarios which are consistent with the Framework published in the first NGFS Comprehensive Report. The set includes three representative scenarios, which each cover one of the following dimensions:

- **Orderly** assumes climate policies are introduced early and become gradually more stringent. Net zero CO₂ emissions are achieved before 2070, giving a 67 per cent chance of limiting global warming to below 2°C. Physical and transition risks are both relatively low.
- **Disorderly** assumes climate policies are not introduced until 2030. Since actions are taken relatively late and limited by available technologies, emissions reductions need to be sharper than in the Orderly scenario to limit warming to the same target. The result is higher transition risk.
- **Hothouse world** assumes that only currently implemented policies are preserved. Nationally Determined Contributions are not met. Emissions grow until 2080 leading to 3°C+ of warming and severe physical risks. This includes irreversible changes like higher sea-level rise.

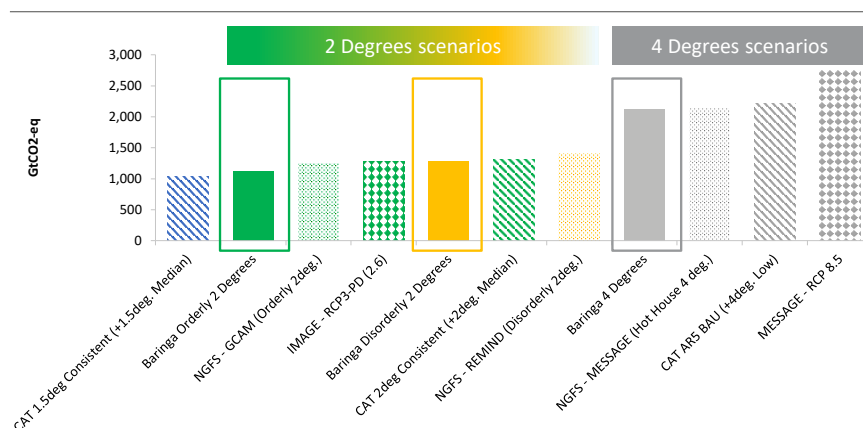
In addition to the three representative scenarios, five alternative scenarios are also provided based on availability of carbon dioxide removal (CDR) technologies and meeting of nationally determined contributions (NDCs).

Figure 67: NGFS scenarios



Benchmarking SCB-Baringa scenarios to external scenarios

Figure 68: Benchmarking SCB-Baringa scenarios to external scenarios



Appendix 3: Technical overview of Baringa impact model

Figure 69: Company-level assessment of financial impact of transition risk

As an area for further development, we are exploring inclusion of physical risk insights into the financial modelling solution, to have an integrated view of financial risks from climate change at a client-level. The physical risk related components highlighted in blue are work-in-progress.

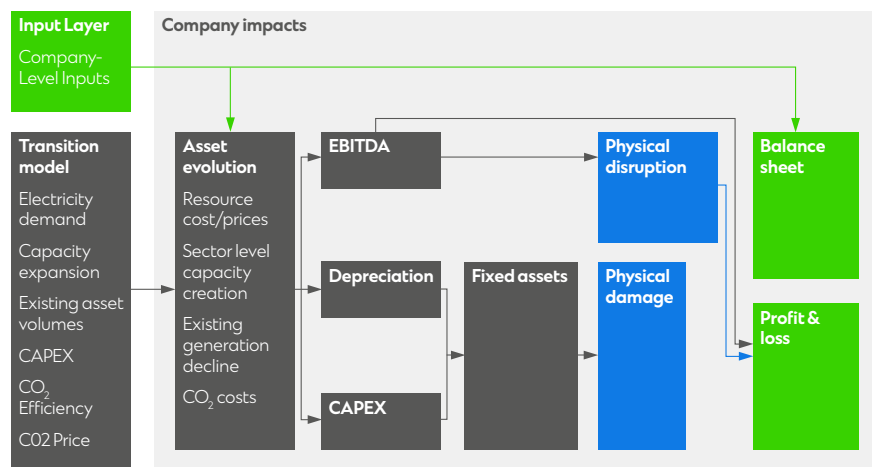


Figure 70: Technical overview of Baringa temperature alignment model and future developments

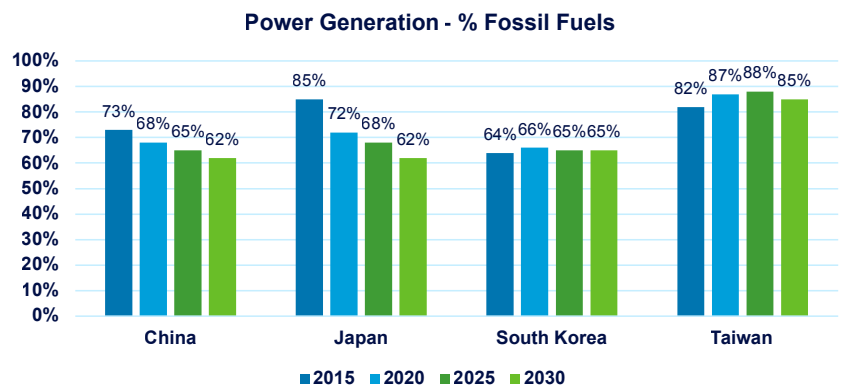
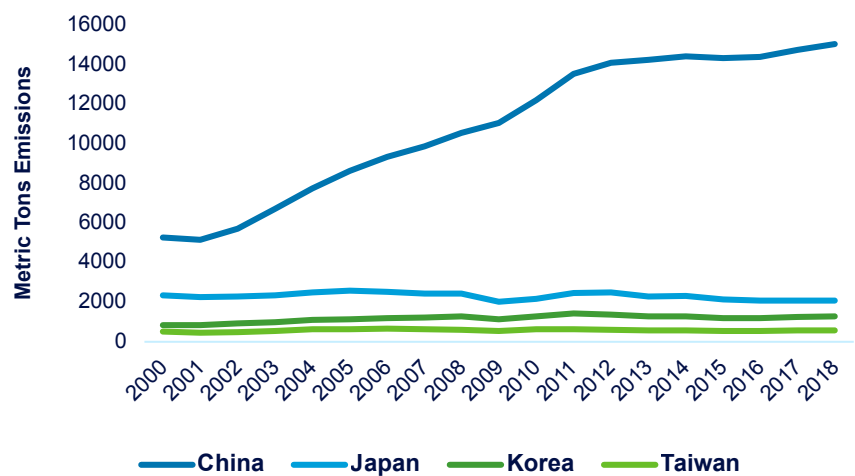
Sector	S1 & S2 method	S3 method	Future development
Generic	Revenue intensity	Not yet assessed	Consider inclusion of S3 alignment
Oil & Gas	Revenue intensity with commodity normalisation functionality	Implicitly assessed through production	n/a
Mining	Revenue intensity	Coal production results in +6	n/a
Power	Bottom-up production intensity from capacity/ MWh by technology	n/a	n/a
Financials	Revenue intensity	Not yet assessed	Consider inclusion of scope 3 financed emissions
Autos	Revenue intensity	Not yet assessed	Consider inclusion of scope 3 tail-pipe emissions
Universal	n/a	n/a	Consider functionality to override forward emissions curves with company strategy

For generic and power companies, Baringa's temperature alignment model focuses on Scope 1 and Scope 2 emissions as these are most directly attributable to a firm's management actions, are generally of higher data quality than Scope 3 emissions and have the most meaningful benchmarks. In addition, for hydrocarbon (such as oil and gas) producers, scope 3 alignment is derived from volume of hydrocarbon production rather than intensity. All coal production components of a company are rated as 6° alignment. Overall temperature alignment is an average of the constituent sub-alignments (Scope 1, 2 and 3 where relevant) weighted by emissions.

Appendix 4: Example of Sovereign-level data from S&P Trucost

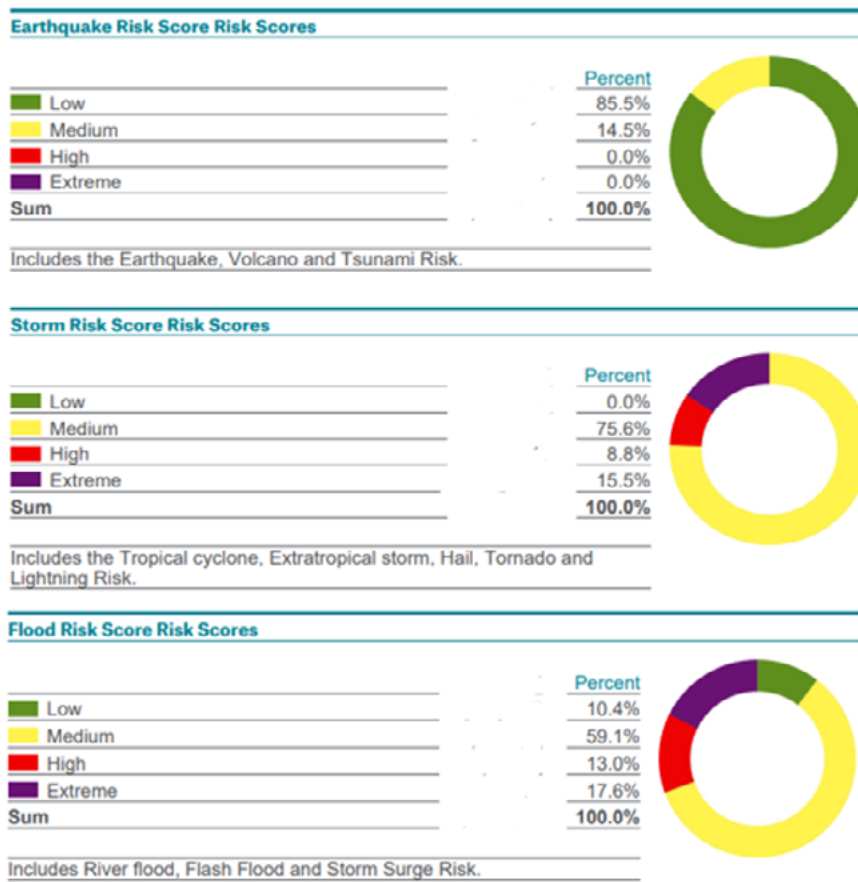
Trucost's sovereign greenhouse gas emissions database covers 170 countries covering all Greenhouse Gas Protocol gases, and covers all sectoral emissions including those associated with land use change. The sectoral emissions associated with any aspect of an economy's activity, i.e. the carbon intensity of an economy, reflects the carbon dependency of an economy, whether it is demand-driven (domestic or imported) or offer-driven (exported). It is the equivalent of accounting for direct + indirect emissions already a standard in the corporate world.

Figure 71: Sovereign emissions and power generation mix



Appendix 5: Gross physical risk profile for our operations in South Korea

Figure 72: Gross physical risk profile for our operating locations in South Korea



Appendix 6: Distribution of corporate clients analysed

Figure 73: Distribution of 100 corporate clients included in initial client-level assessment by region and exposure

Our initial client-level assessment (Section A1 in Risk: CCIB) included 100 of our clients with collective total net nominal exposure of USD38.9 billion. Below provides a breakdown of regions covered.

Region	ASA	GCNA	EA	AME	Total
# Clients (entity level)	18	34	36	12	100
# Clients (group level)	12	24	28	11	75
Net nominal exposure (USD mn)	5,755	15,031	14,360	3,756	38,902
% of overall corporate exposure	14%	25%	33%	15%	23%

Figure 74: Distribution of 100 corporate clients included in initial transition risk assessment metrics disclosed

Figure 74 provides a breakdown by regions and net nominal exposure that informed the results in Figure 58 and Figure 60.

Region	ASA	GCNA	EA	AME	Total
# Client entities	24	42	13	21	100
# Group entities	21	36	12	20	89
\$ Nominal exposure (USD mn)	2,265	4,738	1,425	2,470	10,897
\$ Nominal exposure (USD mn)	5.5%	7.7%	3.3%	9.9%	6.3%