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Fragile Planet 2021

Scoring climate risks: who is the most resilient?

The pandemic has shown the world's fragility... but also its capacity to fight back

Similar urgency is needed to tackle climate change, which poses an even bigger long-term risk to the planet

We rank 77 countries on their ability to shift from fossil fuels, adapt to climate change and profit from cleantech, adding 12 indicators to this year's analysis

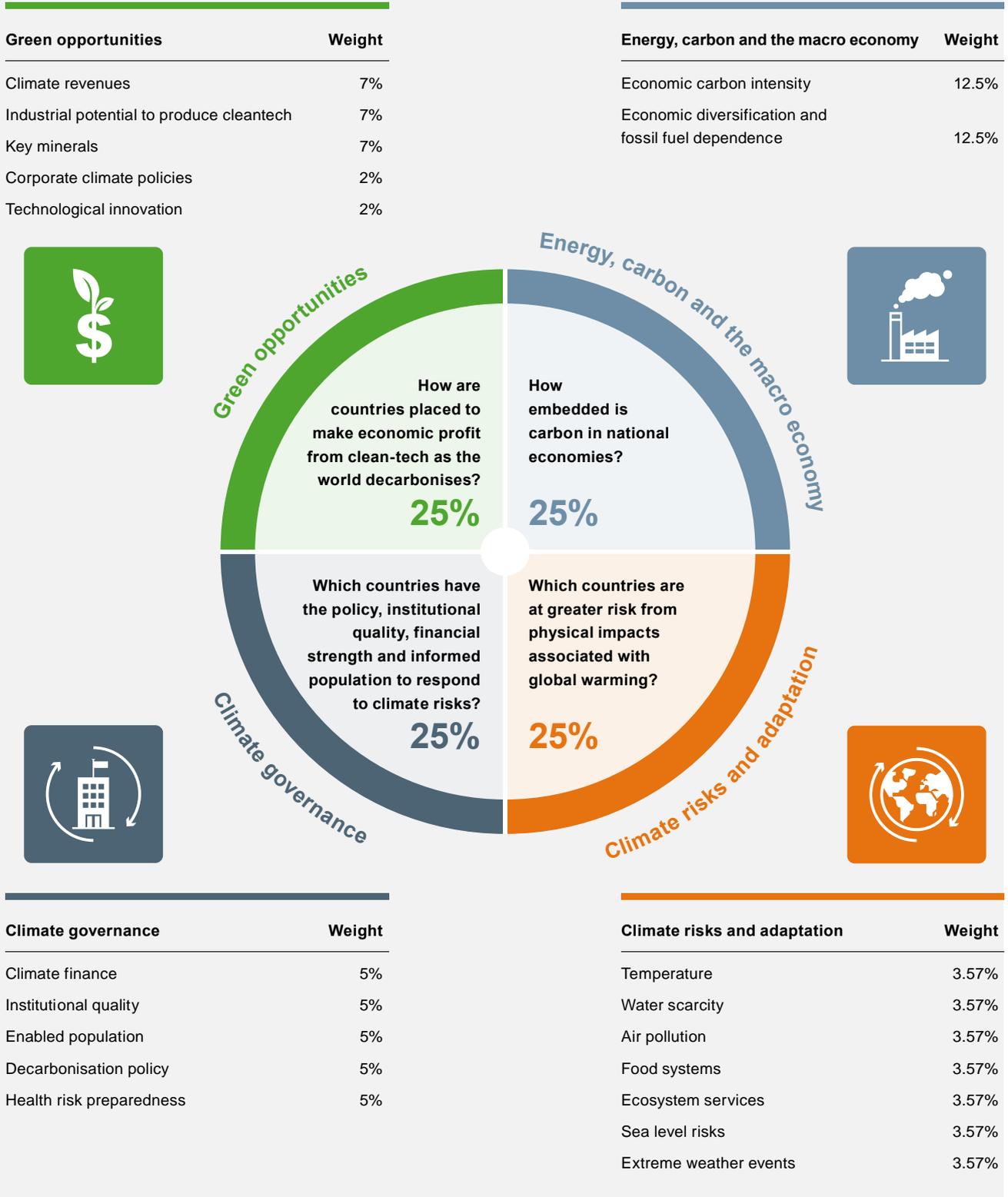
This is an abridged version of a report by the same title published on 30-Mar-21. Please contact your HSBC representative or email AskResearch@hsbc.com for more information.

Disclosures & Disclaimer: This report must be read with the disclosures and the analyst certifications in the Disclosure appendix, and with the Disclaimer, which forms part of it.

Fig. 1.

Scoring climate risks

Which countries are most resilient in the face of rising climate risks – our methodology



Source: HSBC

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Fig. 2.

From resilience to vulnerability

Greater resilience

Sweden



- ◆ Low emissions per GDP (2nd best)
- ◆ Overall second on Climate Risks and Adaption quartile
- ◆ Highest level of corporate climate policies, given size of the economy

France



- ◆ Lowest dependence on fossils for energy; corresponding highest use of alternative energy
- ◆ High ranking on the Gender Parity Index
- ◆ Second best for Green Opportunities

Finland



- ◆ Top ranked for Climate Risks and Adaptation
- ◆ Very low exposure (currently) to extreme weather events
- ◆ Second to Norway on overall Climate Governance

Source: HSBC

More vulnerable

Nigeria



- ◆ Second most vulnerable in two quartiles: Climate Risks and Adaption, and Climate Governance
- ◆ Lowest exposure to Green Opportunities
- ◆ Only 38% of forested area remaining since 1990 levels

Bangladesh



- ◆ Very low resilience via Green Opportunities and Climate Governance
- ◆ Highest number of deaths per capita associated with extreme weather events between 2011-2020
- ◆ One of the lowest ranked countries for corruption and regulatory quality

Côte d'Ivoire



- ◆ Second worst on deaths attributable to air pollution
- ◆ Third lowest share of the population enrolled in tertiary education
- ◆ Lowest emissions per capita of the sample set

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Executive Summary

Fragile Planet 2021

The COVID-19 global pandemic has, in our view, demonstrated humankind's *fragility*. But it has also shown our potential for *resilience*, as system supports have been rapidly deployed to protect life and society. Yet we face an even bigger, systemic risk in climate change. Now we need a similar level of urgency and determination to protect populations from the dangers of global warming. In this report, using an enhanced set of indicators this time, we again analyse which countries are more resilient, and which more vulnerable, to a broad set of climate risks.

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With annual emissions still rising¹, so is the temperature, up around 1.2°C since the mid-19th century. As global warming increases, so do the associated impacts. These include Arctic ice melt and rising sea levels, ocean acidification, disruption to hydrological cycles, desertification and higher risks from extreme weather events.

Off-track for Paris

Currently, we are *not* on track to meet the maximum warming targets of the Paris Agreement². The last climate negotiations, COP25, held in December 2019 left several important matters unresolved. COP26, in Glasgow in late 2021, is seen as an important COP³ because it is to focus on raising (post-2020) ambition levels around decarbonisation and other climate priorities. ([The Climate in 2021](#), 5 January 2021).

Global pandemic has shown fragility...and resilience

After centuries of attempting mastery over nature, COVID-19 has served as a reminder of how exposed society is to our treatment of and interaction with ecosystems, biodiversity and natural systems, as a virus that was passed from animals has wreaked profound negative socio-economic impacts. Nevertheless, the response has shown that there is enough institutional strength and financial firepower to deploy huge resources globally and rapidly.

We do think we can see evidence that the world is becoming increasingly focussed on climate change. Yet some countries look better placed on this than others. And so, as we did last year in [Fragile Planet 2020 – Scoring climate risks: who is most resilient](#), we ask a question:

◆ **Which countries are more resilient in the face of rising climate risks?**

¹ 2020 is a slight anomaly, down c.7%, due to the collapse in economic activity associated with the pandemic, but emissions in many countries are already bouncing back

² According to the UN Environment Programme's (UNEP) 2020 Emissions Gap Report, the world is "absolutely not" on track with either current policies, unconditional or conditional climate pledges.

³ The UK has outlined five issues that will be a focus of action at COP26: 1. Adaptation and Resilience 2. Nature or nature-based solutions 3. Energy transition 4. Clean road transport 5. Climate finance

More countries

This is the fifth in our series of Fragile Planet reports. This time, we have once again expanded the list of developed (DM), emerging (EM) and frontier market (FM) economies we study, from 67 to a set of 77⁴.

The report is organised into four sections, each seeking to answer a single question, which together feed into the main question above. The four section-related questions are as follows:

- ***How embedded is carbon in national economies?***
- ***Which countries are at greater risk from physical impacts associated with global warming?***
- ***Which countries have the policy, institutional quality, financial strength and informed population to respond to climate risks?***
- ***How are countries placed to make economic profit from cleantech as the world decarbonises?***

New indicators

We have enhanced the set of indicators we use to explore these questions. We newly include datapoints allowing us to explore dynamics around fossil fuel subsidies, regulatory quality, gender equality, health risk preparedness, biodiversity loss and sea level-rise. Plus, we include an expanded list of commodity reserves and production data, up from six to 16 and now including platinum, rare earths, vanadium and others. This takes us to a total of 49 indicators – of which 12 are new – explored via 92 datapoints for each country in this analysis.

“ The pandemic response shows there exists institutional strength and financial firepower to deploy huge resources in the face of a systemic challenge

Podium places go to European nations...but relevant risks can lie in individual datapoints

The 3 best-placed countries – the most resilient - are dominated by wealthy, European nations. **Sweden** ranks first, followed by **France** and **Finland** (The **US** is in fifth place). The 3 most vulnerable countries are dominated by those in warmer latitudes, in descending order – **Nigeria** ranks as most vulnerable, followed by **Bangladesh** and **Cote d’Ivoire**. However, while the final rankings (Fig. 2) are interesting, we believe digging into the detail is more illuminating; i.e., the value in this report can be found in specific areas of risk and individual indicators.

A huge, global response is necessary to address climate risks

Decarbonisation requires technological innovation, economic support and policy formation and delivery. Similarly, the build-up of resilience to the negative impacts of warming will require a massive financial, technological and political response. Yet there are opportunities for countries which move quickly and prudently, to protect societies and even to enhance economic outlook.

“ We take a broad lens in analysing climate risks for 77 developed, emerging and frontier market countries, utilising 92 separate datapoints to explore 49 indicators

While the pathway to delivering climate resilience is extremely challenging, we believe that catalysts continue to come and, for every disappointment in the rate of response and transition, other areas surprise positively. COP26 is a major opportunity to drive global climate ambition yet further forward. And we think the importance of the European Union implementing the intentions of its Green Deal is substantial, in driving scale and ambition. Furthermore, we expect China and the US to join the race to deliver an energy transition and climate resilience leadership. And indeed, all countries need to increase their ambition and deliver on their plans. It remains possible for countries to build social, economic and environmental resilience, but they must act rapidly and act radically.

⁴ Countries included in our framework that weren't included in Fragile Planet 2020 are: Botswana, Bulgaria, Côte d'Ivoire, Cyprus, Ghana, Iceland, Latvia, Malta, North Macedonia, Slovakia, Tanzania.



Why is this important?

Monitoring individual country vulnerability to climate change factors is, in our view, important for reasons including:

Inflation	Attractiveness of foreign direct investment (FDI)
<p>Climate effects could impact food or energy output, driving up prices.</p>	<p>Smarter globalised companies are incorporating climate factors into operational growth strategies. Regions with low vulnerability to extreme events driven by climate change carry less risk.</p>
Balance of payments	Short-run growth
<p>Countries with high exposure to climate factors could face higher trade deficits as companies choose to source goods from other countries where climate risks are lower to mitigate supply chain disruption.</p>	<p>Damage costs from extreme climate events are a drag on economic growth, and create extra growth volatility. According to the Emergency Events Database, damage costs relating to extreme events in the G20 alone totalled USD978bn in the decade to 2018, up from USD630bn in the decade to 2008.</p>
Long-run growth	Supply chain disruption
<p>The depletion of natural capital hurts overall productivity (e.g., water depletion can increase the cost of energy), and thus affects a country's ability to generate long-term sustainable growth.</p>	<p>Provision of goods and services may be disrupted, putting pressure further along production chains.</p>
Infrastructure investment requirements	Social risks
<p>Countries will need to invest in power, transport, waste and buildings infrastructure to be resilient to high probability extreme weather events and slow-onset climate-driven physical factors. Water infrastructure is also very important. The consequences of 'water stress' depend to a great extent on how efficiently the resource is managed.</p>	<p>Climate change has been given as one factor behind incidences of large-scale migration and conflict, such as in Syria and Mali, highlighting the requirements to understand the nature of exposure to countries where social impacts occur.</p>
Inequality	Health issues
<p>The poorer regions of the world, concentrated in the tropics, are more susceptible to climate impacts. Poorer populations within countries are also likely to be less able to adapt. Evidence shows that women are often more affected by climate impacts in many developing nations.</p>	<p>Higher temperatures and changing water patterns increase the public health risk.</p>
Opportunities	
<p>Some countries are well placed to earn revenues as the world decarbonises, by producing the products and technologies that will drive the transition. Certain countries are already producing cleantech today or have the diverse industrial base to do so in greater quantity in the future.</p>	

We acknowledge the contribution of Abhishek Kumar, Payal Negi and Anushua Chowdhury, climate change analysts, Bangalore, in the preparation of this report



Energy, carbon and the macro economy

- ◆ Denmark has the lowest transition risk, as our findings show huge variance once again
- ◆ We analyse emissions, alternative energy and fossil fuel dependence metrics, adding hydrocarbon subsidy data in this report
- ◆ Our analysis finds oil & gas-rich countries to be most vulnerable, headed by Kazakhstan and Gulf states

In this section we ask the question:

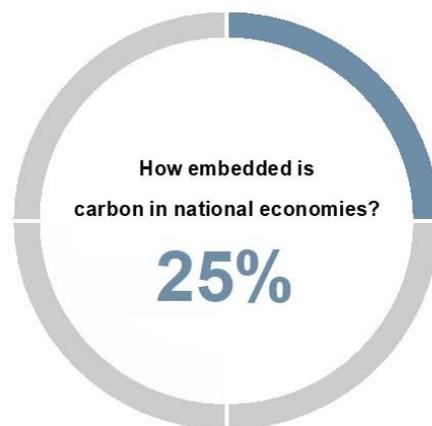
How embedded is carbon in national economies?

Metrics to understand transition risk

To answer this, we review a range of datapoints. These metrics allow us to analyse, at the country level, which countries are systemically more **carbon intensive** and those that are more exposed to the risks that economic **dependence on fossil fuels** brings. Another way to describe this is to ask which countries have **higher transition risk**. (Fig. 3 lists the metrics used and discussed in this chapter.)

Fig. 3.

Energy, carbon and the macro economy



Economic carbon intensity 12.5%

1. Alternative energy
2. Emissions per capita
3. Emissions per GDP
4. Emissions from LULUCF

Economic diversification and fossil fuel dependence 12.5%

1. Fossil fuels in the economy
2. Fossil exports
3. Fossil reserves-to-breakeven ratio
4. Energy subsidies

Source: HSBC. Note: LULUCF = Land use, land use change and forestry

The findings show European countries dominating the top half of the list. These are most resilient in a world striving for decarbonisation – they have lower transition risk. **Denmark** (first place) has low emissions per GDP, and low reliance on fossil fuel exports. **Switzerland** (third) has low emissions as it generates the vast majority of its power from alternative energy sources. **Romania**, in second place, has built out more hydro power and scores very well on emissions relating to its sizeable, largely intact forests.



At the more vulnerable end of the spectrum which faces greater transition risk, lie oil-rich **Kazakhstan** and the **Gulf states**, given their dependence on the old energy economy for both economic output and domestic energy supply. Nevertheless, many of these states perform better on the “change” metrics associated with economic diversification, as the region begins to make some progress here. **Tanzania** has relatively low emissions per capita (it is one of the less wealthy states in our sample set) yet the country performs poorly on the change aspect of this metric, and on an emissions-per-GDP basis.

Economic carbon intensity

We begin by analysing the carbon intensity of a country and its economic activity, before looking at use of alternative energy sources. We consider both current levels as well as change indicators when measuring carbon dependence, crediting those countries with low-carbon profiles *and* about capturing the transition away from carbon intensity over time. We do this by looking at the **share of alternative energy sources** – including solar, wind, hydro, bioenergy, geothermal and nuclear – in total primary energy demand and the change over the last decade (using World Bank data).

We also look at metrics which consider a country’s **emissions per capita and per unit of GDP**. Finally, we consider **emissions from land use change and forestry** (per capita) to integrate an understanding of the importance of agriculture and other activities which can have a significant impact on a country’s overall net emissions profile

Economic diversification and fossil fuel dependence

Peak fossil demand?

Most projections see energy demand rising with population and affluence increases. However, reemissions to a net-zero level by 2050 will necessitate wholesale transition away from the use of fossils in power generation, modes of transport, and other areas that are necessary for a range of societal needs.

This presents a further risk to those economies dependent on fossils for economic output. What is known as the ‘resource curse’: the phenomenon of natural resource economies growing slower over time than comparable economies that have lower natural resource endowments.

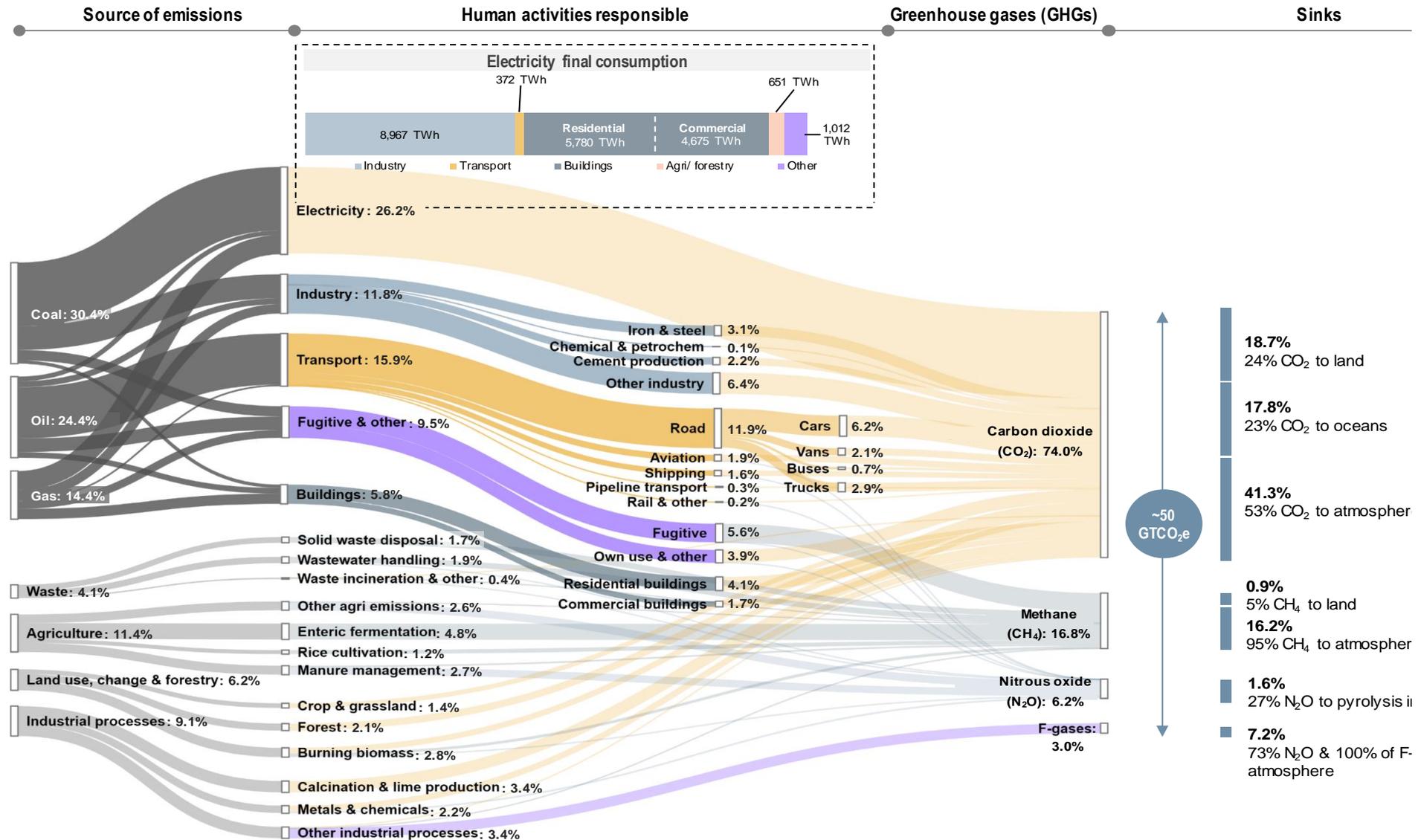
Diversification is key to transition

We think achieving diversification is key and look here at the extent to which the 77 countries under consideration are diversified in relation to fossil fuel, their exports and their economic production. Overall, emerging and frontier market countries are on average notably more exposed to fossils. Fossil fuel exports made up 4.0% (2018) of GDP in emerging and frontier market countries on average, compared to 1.7% in developed market countries. On average, fossil fuel exports made up nearly 15.3% (2018) of total export revenues in emerging and frontier markets. In developed markets, it is about half of that number, with only 8.6% of total exports coming from fossils.

This is an abridged version of a report by the same title published on 30-Mar-21.

The full note contains an in-depth look at the different indicators for how energy and carbon affect the macro economy. Please contact your HSBC representative or email AskResearch@hsbc.com for more information.

Fig. 4. How do we emit? Global GHG emissions in 2017



Source: HSBC, IEA, EDGAR, Global Carbon Project; values for sinks adjust calc. error; F-gases sources are not shown here but typically include refrigeration, air conditioning, aerosols and high voltage switchgear; LUCF is Land Use Change and Forestry; data for LUCF values are inherently uncertain and may show variations based on accounting; Own use & other includes losses and agricultural use of energy; Other agri emissions includes direct emissions and emissions from agri waste burning & other indirect emissions; Other industry includes non-ferrous metal, paper & pulp and mining & quarrying; Energy and process emissions from calcination and cement production is nearly 2.5 GtCO₂. production of coke for iron & steel, feedstock for chemicals and petrochemicals, and some parts of oil & gas refining are classified as other industry.



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Climate change issues a key driver of commodity price trends

Climate change developments, as well as the pandemic, are having profound effects on commodity markets. The pandemic is expected to change some demand patterns permanently. In particular, working-from-home will accelerate digitalisation and reduce travel – with implications for oil demand. At the same time, the COVID-19 shock and the government spending programmes it prompted – plus a new US administration, the European Green Deal and Beijing adopting a net-zero target – have bolstered the momentum in global climate-change policy.

The intertwined nature of shifting climate change realities, policies and attitudes and the impact on commodity markets has increasingly meant that tracking and forecasting commodity market developments involves a clear perspective on climate change developments. In our view, commodity markets and climate policy cannot usefully be assessed in isolation, so much of our recent commodities coverage explicitly seeks to set out climate policy views to underpin the commodity market forecasts.

Climate change has clear impacts on demand for commodities. For example, government policy changes are motivating reduced carbon emissions, decreasing demand for carbon-intensive products, such as coal and oil, and favouring those commodities used in cleaner energy production, such as the battery and electricity network-related materials, lithium, cobalt and copper.

The supply-side for many commodities has also been heavily impacted by changing policies and attitudes towards climate change. Over the past couple of years there has been a distinct and rapid shift in corporate and investor policy. Major corporates across the world have sought to adopt net-zero emissions strategies. Large fund managers have been shifting their investment mandates, shunning investment in higher carbon-emitting technologies, such as coal mines. Financial innovations, such as green bonds, are facilitating these shifts.

In the commodities sector itself there has been increased recognition of the need to decarbonise production. Major producers of oil, steel and energy products have been announcing more stringent carbon mitigation strategies, to reduce the carbon-footprint of the production of resources.

At the same time, although many of the sorts of impacts on commodity markets are clear, for some commodities the effects can be counter-intuitive. For example, while high carbon emitting commodities, such as coal and oil, are set to see lower long-term demand, in the short run, a lack of investment in coal mines and large oil projects may limit near-term supply, lifting prices.

Beyond policy changes, climate change is also directly impacting the production of some commodities, particularly agricultural products. More frequent and extreme weather events disrupt agricultural supply chains, as some previously agriculturally-productive locations are unable to produce as much, and other locations become more productive. For instance, the recent La Niña event is driving grains prices higher as it constrains South American supply.

Climate change can also exacerbate other factors reshaping agricultural markets, such as worsening the impacts of disease and pests. For example, African Swine Fever has sharply reduced the hog herd in China, boosting demand for imported protein and re-shaping global meat and feedstock markets.



Climate risks and adaptation

- ◆ The global temperature is rising, but increases are not linear and some countries are warming faster
- ◆ Climate change also drives water, food, ecosystem and extreme weather event risks
- ◆ Overall, Asian and African nations score as more vulnerable in this section of our analysis

We're already living through climate impacts

The impacts of climate change are no longer a future risk. Almost all regions were affected by extreme weather events in 2020, with records now seemingly broken quickly in succession all around the world, the effects of which go well beyond physical damage, highlighting the inadequacy of social infrastructure and welfare mechanisms.

We have observed that the rise in impacts and the need to adapt to these have become more prevalent on the global climate policy agenda. A key pillar of the Paris Agreement captures this:

- **Increasing the ability to adapt to the adverse impacts** of climate change and foster climate resilience and low greenhouse gas emissions development, in a manner that does not threaten food production

And so, once again, the question which we seek to answer in this section is:

Which countries are at greater risk from physical impacts associated with global warming?

To answer this, in this section we look at an expanded set of metrics. The datapoints which allow us to explore these metrics cover warming temperatures, water scarcity, food systems, air pollution and extreme weather events, as in [Fragile Planet 2020](#), January 2020. However, on this occasion, we are also including ecosystem services and sea level risk metrics in our analysis.

“ the rise in impacts and the need to adapt to these have become more prevalent on the global climate policy agenda

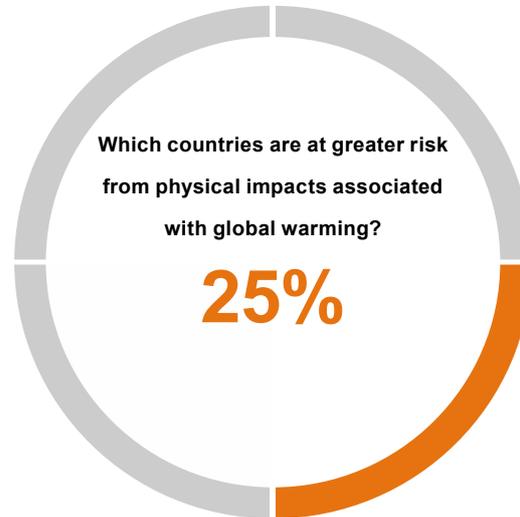
More physical climate risk in emerging and frontier markets

The **Nordics** score well on resilience in this section, once again, as do other wealthy European nations. **Canada** and the **US** both rank well in this section (5th and 9th respectively), despite carrying some high risk factors relating to extreme events, both in terms of increases in the number of people affected and damage costs over the past decade.

At the other end of the table, EM and FM countries dominate. Bottom-ranked **Sri Lanka** shows high vulnerability in relation to water metrics, deforestation, extreme weather events and biodiversity risks. **Nigeria** and **Egypt** rank as next most vulnerable.



Fig. 5.
Climate risks and adaptation



Temperature	3.57%
1. Average and change	
Water scarcity	3.57%
1. Renewable water	
2. Basic drinking water services	
Air pollution	3.57%
1. Ambient air quality – PM10 levels	
2. Outdoor air pollution – fatalities	
Food systems	3.57%
1. Agricultural value add in GDP	
2. Food security – cereal dependency ratio	
3. Food security – food production variability	
Ecosystem services	3.57%
1. Deforestation	
2. Biodiversity – threatened species by population	
3. Biodiversity – threatened species by land area	
Sea level risks	3.57%
1. Land elevation – land area below 5m	
2. Land elevation – population living below 5m	
Extreme weather events	3.57%
1. Frequency of events	
2. Sensitivity – people affected	
3. Sensitivity – fatalities	
4. Sensitivity – damage costs	

Source: HSBC

This is an abridged version of a report by the same title published on 30-Mar-21.

The full note contains an in-depth look at the different indicators for how different economies deal with climate risks and adaptation to the implications of climate change. Please contact your HSBC representative or email AskResearch@hsbc.com for more information.



Climate governance

- ◆ Some countries have greater potential to respond to transition and physical risks
- ◆ Nordic and other northern European nations rank highest in our analysis here...
- ◆ ...with their resilience supported by wealth, policy frameworks, institutional quality and, via newly included indicators, their gender equality and healthcare preparedness

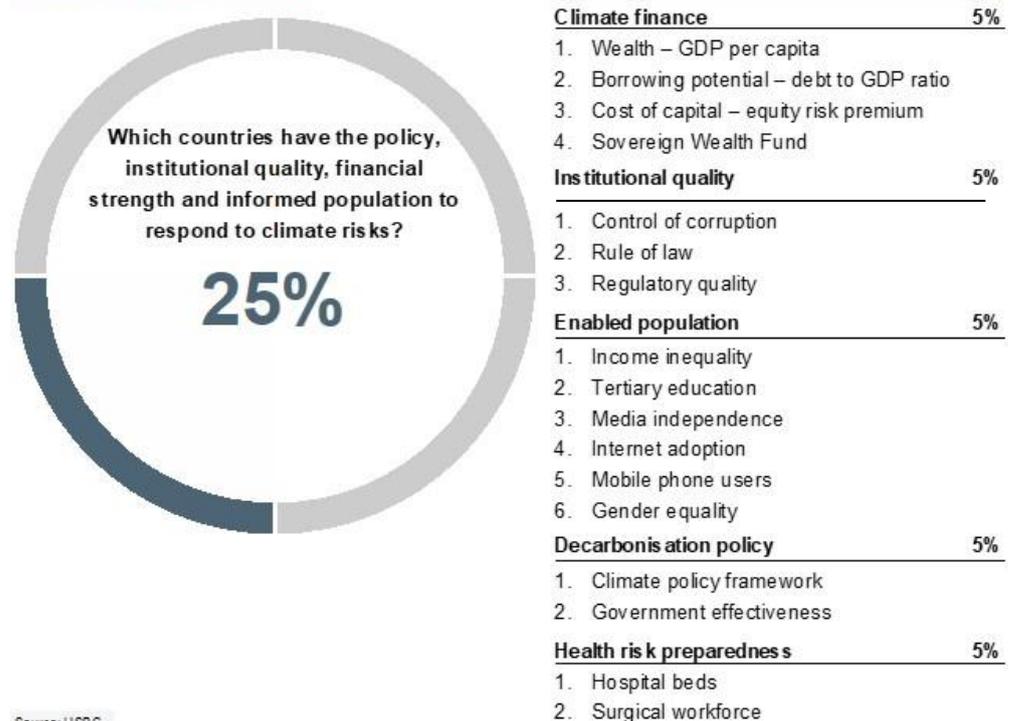
We now move from the focus of the previous two sections – which essentially analysed the first two pillars of climate change, namely mitigating emissions and addressing the impacts – to an analysis, in this section, of **which countries are better placed to address climate risks**.

We distil this into a single question:

Which countries have the policy, institutional quality, financial strength, health preparedness and informed population to respond to climate risks?

The wealthy **Nordics** fare well in this part of the analysis, buoyed also by strong showings on finance, institutional quality and policy indicators. At the other end of the spectrum, **African** and **South Asian** economies look more vulnerable.

Fig. 6.
Climate governance



Source: HSBC



It's about money...

So, which countries are better placed to *respond* to the transition and physical risks analysed in earlier sections? We answer this by looking at *capital available* to do this, using various wealth indicators.

...the institutional ability to prudently deploy funds

We then explore *institutional quality indicators* as a guide to countries that are well placed to use this capital. This time, we have added an indicator for *regulatory quality* in this section. This reflects perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development. This can be supportive to the build-out by companies of climate-response technologies and infrastructure, both around energy transition and to physical risks.

...as well as an enabled population

We then explore the extent to which the population of a country is enabled to understand, be kept informed and ultimately influence leadership to mitigate risks it faces. Here we include indicators around equality, education and informational flow. Plus, in this report, we also now include *gender equality*, having studied growing evidence of links between gender equality and enhanced environmental outcomes⁵. At an educational level (which our gender equality metric considers), more equality of education provision increases the number of individuals that can access education and hopefully become productive members of society, the expertise of which may well allow for a stronger climate response. The COVID-19 pandemic has only further highlighted inequalities across societies around the world, and so we believe that including this metric is now more important than ever.

...and robust climate policies

Additionally, we have updated the methodology for our *climate policy outlook* scoring system in this iteration of the report, given that a number of countries have recently strengthened their climate policy pledges, including via the emergence of 'net zero' pledges. Having policy is one thing, achieving ambition is another, so we use the World Bank's Government Effectiveness indicator to gauge this aspect.

...plus a resilient healthcare system to support societies facing growing climate-exacerbated health risks

Finally, we include a new section in this analysis on *Health Preparedness*. With increased focus on health risks due to the COVID-19 pandemic, we believe it is important to explore which countries are better placed to deal with climate exacerbated health risks. Indeed, this will in our view be a growing factor in climate resilience.

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The full note contains an in-depth look at the different indicators for which countries have the policies, institutional quality financial strength and willing and informed populace to deal with climate change. Please contact your HSBC representative or email AskResearch@hsbc.com for more information.

⁵ <https://www.carbonbrief.org/tackling-gender-inequality-is-crucial-for-climate-adaptation#:~:text=Efforts%20to%20tackle%20gender%20inequality,change%20than%20their%20male%20counterparts.>
<https://www.iucn.org/resources/issues-briefs/gender-and-climate-change>
<https://www.wri.org/blog/2016/03/if-you-care-about-environment-you-should-care-about-gender>



Green opportunities

- ◆ In a world combatting climate change, opportunities abound for companies selling climate products and solutions
- ◆ Companies from China and US are already earning high revenues from climate solutions, while Japan’s high patent approval rate translates to rapid revenue growth
- ◆ An expanded list of key transition minerals puts South Africa, China and Chile at an advantage given high shares of reserves and production

Displaying resilience through low-carbon transition is not *only* about being better placed to transition away from high-carbon domestic activities *or* having the policy outlook to move away from fossil fuels.

Greater resilience through climate revenues

We see the transition as an opportunity for countries able to sell the products and technologies which allow it to happen. Indeed, we believe those countries that can generate more revenues as the global economy decarbonises are likely to be among the *most* resilient.

And so we ask a question:

How are countries placed to make economic profit from cleantech?

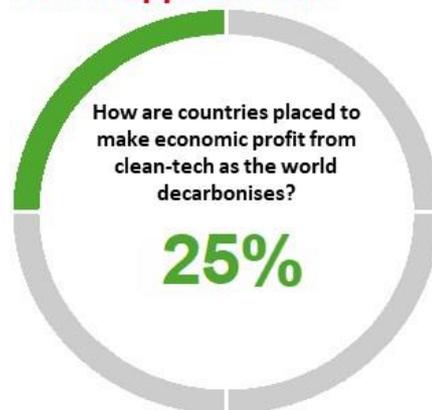
Expanded list of mineral endowments

We identify which countries have companies earning more **revenues from climate change aligned themes**. We also look forward and ask which countries have **parallel industries to cleantech production** – suggesting an easier switch towards the green opportunities. Additionally, this year we expanded our analysis of **mineral endowments of hard commodities** necessary for low-carbon technology deployment. We continue to examine the number of **companies establishing climate policies** and, lastly, we look at **patent registration data in relevant industries**.

Overall, we find **China** best-placed to make profits as the world moves towards a lower-carbon future, followed by **France**. At the other end of the spectrum, countries which are economically more dependent on fossil fuel production, particularly in the **MENA** region.

Fig. 7.

Green opportunities



Source: HSBC

Economic exposure and opportunities 25%

1. Climate revenues
2. Climate revenues relative to GDP
3. Industrial potential to produce cleantech
4. Key minerals – share of global reserves and production
5. Corporate climate policies
6. Technological innovation

This is an abridged version of a report by the same title published on 30-Mar-21.

The full note contains an in-depth look at how countries can benefit from the transition to cleantech. Contact your HSBC representative or email AskResearch@hsbc.com for more information.

Final rankings

To recap, in this report, we've looked at four areas and in each tried to address one question:

- *How embedded is carbon in national economies?*
- *Which countries are at greater risk from physical impacts associated with global warming?*
- *Which countries have the policy, institutional quality, financial strength and informed population to respond to climate risks?*
- *How are countries placed to make economic profit from clean-tech as the world decarbonises?*

We focussed on answering these questions and building an overall picture of resilience vs vulnerability, using **49 indicators – of which 12 are new - explored via 92 datapoints for each of the 77 countries** in this edition.

This enables us to then rank developed, emerging and frontier market countries on their resilience and, at the other end of the spectrum, vulnerability in relation to this one, overarching question:

Which countries are most resilient in the face of rising climate risks?

We've also expanded the list of countries to a total of 77.

Wealthy Europe leads the way, with the four large **Nordic** economies in the top ten, joined by **France, Germany, the UK, Switzerland** and **Austria**. Behind **Korea**, other better-placed EM nations overall, include **Poland** (20th), **Chile** (21st) and **China** (24th). **African, South Asian** and **MENA-region** countries populate the bottom quartile.

However, while the final rankings are interesting, we believe digging into the detail is more illuminating; i.e., the value in this report can be found in specific areas of risk and individual indicators. We think consideration of all four areas of this report – transition risks, physical impacts, the potential of countries to respond and the green opportunity set – are essential to understand resilience, at the country level.

Decarbonisation requires technological innovation, economic support and policy formation and delivery. Similarly, the build-up of resilience to the negative impacts of warming will require a massive financial, technological and political response. Yet there are opportunities for countries which move quickly and prudently, to protect societies and even to enhance economic outlook, in our opinion. We believe it remains possible for countries to build social, economic and environmental resilience, but they must act rapidly and act radically.

“ Achieving the aims and ambitions of the Paris Agreement are not a given. The world needs to understand the urgency and complexity of what the international community has embarked upon.

Patricia Espinosa, Executive Secretary of UN Climate Change

In the short, medium *and* long term, *all* countries face climate risks of different types and will need to build resilience in this changing world. Transfer of finance, technology, policy expertise and information can also help more vulnerable and less developed countries to face growing climate risks. We believe these will all form part of the climate response of the 2020s.

Disclosure appendix

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