

# Climate risk

Special report 2021

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# Integrating climate risk into risk management frameworks

One of the most promising news stories to come out of negotiations at the 2021 UN Climate Change Conference, COP26, was the announcement that the Glasgow Financial Alliance for Net Zero now has \$130 trillion committed to combatting climate change. Additionally, its 450 members – which include banks, insurers and investors – have pledged to become net zero by 2050 at the latest. Firms have agreed to report their progress and their financed emissions annually.

This commitment means the private sector could deliver around 70% of total investments needed to meet net-zero goals, according to analysis conducted for the UN High Level Climate Action Champions.

As these financial firms begin to transfer lending and investment from carbon-intensive to carbon-neutral firms and clean technologies, more sectors and financial firms will begin to feel the effects. In a *Risk.net* crowd-sourced scenario-generation exercise, it was revealed that people expect rising carbon prices to have a big impact on just about every sector, financial index and investment (see page 3).

However, even though measuring and mitigating climate risk has become a priority at many financial firms, the discipline is still nascent and poses huge challenges. Modelling climate risk exposures within a portfolio is beset with hurdles. These are discussed in Matthew Lightwood's article, *Applying scenario analysis to climate risk* (see page 14).

While firms are working towards producing their own robust transition plans, many want greater input and clarity from regulators. For example, some banks are calling for regulation to define and set standards for transition lending – loans that intend to aid the transition to a low-carbon economy (see page 16).

As banks work on integrating climate risk into their risk management frameworks, a debate is currently in full swing around whether climate risk can fit into existing credit risk weights, and how it should be treated when it comes to capital rules. This report explores the credit risk weighting (see page 11) and capital rules issues (see page 27).

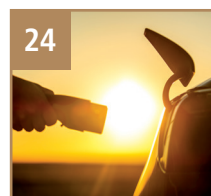
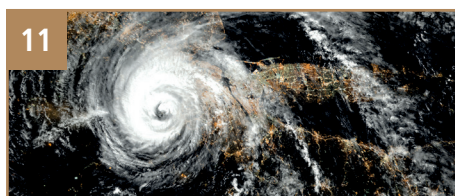
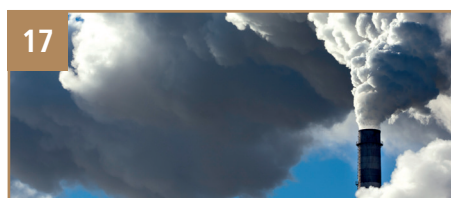
The report also includes a roundtable in Q&A format in which three experts discuss a range of issues from disclosure to climate stress-testing, and from carbon markets to climate metrics, providing insight into how they see these crucial issues developing (see page 20).

Of course, the price of carbon will play a pivotal role in driving green investment, but currently gas and coal prices also jump to the tune of their own fundamental influences, such as weather, supply and demand, and storage availability. This has been very evident in Europe and the UK in recent months, where soaring gas prices have made coal more economical. An analysis of this situation also features in this report (see page 8).

Finally, the 2021 *Climate risk special report* explores some important issues facing investors, asking whether some environmental, social and governance-type investments have inflated values (see page 26) and whether European Union rules could be encouraging greenwashing (see page 30).

Stella Farrington  
Head of content, *Energy Risk*





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# Carbon price shock sees asset prices slump

Crowd-sourced scenario analysis suggests very few sectors are safe from a carbon price pop in the wake of the 2021 UN Climate Change Conference, COP26. By James Ryder

Delegates at this month's UN climate conference have faced many difficult challenges. Some more unusual than others. A strike by Glasgow binmen has led to rubbish piling high in the streets, with giant rats reportedly running amok, terrifying diplomats and locals alike.

In the apocalyptic future some imagine the summit's failure portending, that could be the least of humanity's worries. The Conference of the Parties to the UN Framework Convention on Climate Change – COP26 for short – is seen as perhaps the last chance for nations to take co-ordinated, meaningful action to avoid a rise in global temperatures above 1.5° Celsius. To a growing number of delegates, that means factoring in the cost of carbon pollution to all economic activity, globally.

## Need to know

- A sudden, dramatic increase in the cost of emitting a tonne of carbon would cause widespread dislocations across financial markets, according to *Risk.net*'s most recent crowd-sourced scenario generation exercise.
- Commodities and global equities would take a battering in scenarios where the average price of pollution permits in traded markets leaps by year-end.
- *Risk.net* readers offered projections for a series of financial indicators across three price regimes: little or no change, a modest rise, and a spike.
- But audience projections across all three regimes yielded wide distributions, indicating significant uncertainty among finance professionals.
- The survey's projections are seen as extreme, but not unlikely: a volatile and disorderly carbon transition is emerging as the most likely pathway, according to Zurich's John Scott.

A sudden spike in the price of carbon – by one of several means (see below) – would constitute a supply-side shock, which analysts warn could make oil crises of the past pale in comparison. But perhaps the far bigger unknown is how markets would react: as Charles Donovan, visiting professor of finance at the University of Washington, puts it simply: "Nobody really knows what the effect of a very rapid rise in a global carbon price would be" – because it hasn't happened before.

In *Risk.net*'s latest crowd-sourced scenario generation exercise, we asked 50 of our readers that very question. The verdict: a sudden, significant jump in the price of carbon would cause turmoil in financial markets. A hypothetical portfolio holding a broad range of assets (see figure 1) would be likely to plunge in value, with a mean expectation of an annualised 14.4% decline.

Things look far worse at the tail, however: taking the three-month expected shortfall measure for the portfolio, investors could face a collapse in investment values of more than a quarter, with the biggest contributor to the drop being a fall of nearly

10% in US equities. European and Asia-Pacific equities, particularly Australia, also see falls, and even private equity assets see modest declines. Only government bonds provide some modest cushioning, indicating a likely flight to quality, as observed following the Covid shock last year (see figure 1).

*Risk.net* readers were asked to offer estimates on the movements of a series of financial indicators under three carbon price regimes. In the first regime, the price of carbon remains somewhere below \$60/total carbon dioxide (tCO<sub>2</sub>) by the end of 2021, according to IHS Markit's carbon index, which tracks a trade-weighted average of European and US carbon emission allowances. In the second, the average price lands somewhere between \$60–120/tCO<sub>2</sub>; in the third regime, a higher price of above \$120/tCO<sub>2</sub>.

The short, sharp nature of the implied shock, Donovan adds, means it is unlikely investors and other market participants would be able to avoid absorbing some losses in those scenarios. But firms interested in examining the potential impacts of a price adjustment should consider additional factors beside the speed at which the price could change, he says.

## THE RESULTS

During October 2021, *Risk.net* asked roughly 50 of its readers what they thought would happen to a series of leading financial indicators during the final quarter of 2021, to December 31, under three different carbon price regimes, using IHS Markit's Global Carbon Index as a benchmark: little or no increase in the price of emitting a tonne of carbon, with the price remaining under \$60; a moderate rise, up to \$120; and a sharp increase, above \$120. The scenarios (see link to PDF below), built by Sapiat, were modelled from these anonymised forecasts.

The indicators are the S&P 500, the Euro Stoxx 50; the MSCI Emerging Market index, Brent Crude Oil and the US Dollar Index, which measures the greenback's value against a global trade-weighted basket of currencies.

Those predictions were aggregated and used to feed Sapiat's model, with the impacts of the regimes simulated on an illustrative portfolio containing a wide range of asset classes including equities, bonds and commodities, as well as smaller allocations to alternatives. US equities make up 20% of the portfolio; Europe ex-UK equities, 7%; US government bonds, 10%; and global ex-US government bonds, 10%. The remaining asset classes, including regional equities and corporate bonds, real estate, hedge fund allocations and commodities and infrastructure funds, have weightings of between 3% and 5%.

Out of the total respondents 47% thought carbon prices would remain under \$60 at year-end; 43% thought they would be between \$60 and \$120; while 10% said prices would leap above \$120.



## 1 Portfolio contributions by regime and asset class

	Carbon price <\$60	Carbon price \$60–120	Carbon price >\$120	Carbon price <\$60	Carbon price \$60–120	Carbon price >\$120	Carbon price <\$60	Carbon price \$60–120	Carbon price >\$120
Analytics as %	Mean return (annualised)			Volatility (annualised)			Conditional VAR (3-month, 99%)		
Model allocation	6.88	-0.89	-14.38	7.15	7.03	15.66	-7.33	-10.24	-25.17
	Contribution to return			Contribution to volatility			Contribution to CVAR		
US equities	2.27	-0.70	-6.09	3.02	2.95	6.08	-3.08	-4.18	-9.26
Japan equities	0.20	-0.05	-0.39	0.23	0.22	0.44	-0.24	-0.33	-0.55
China equities	0.43	0.08	-0.33	0.28	0.29	0.40	-0.22	-0.50	-0.81
UK equities	0.14	-0.17	-0.73	0.28	0.29	0.80	-0.35	-0.47	-1.34
Europe ex-UK equities	0.73	-0.36	-2.06	0.72	0.72	1.63	-0.74	-1.20	-2.64
Canada equities	0.22	-0.16	-0.73	0.29	0.30	0.70	-0.34	-0.49	-1.08
Australia equities	0.24	-0.21	-0.81	0.34	0.34	0.74	-0.37	-0.55	-1.44
Advanced emerging equities	0.32	-0.06	-0.70	0.25	0.26	0.63	-0.24	-0.42	-0.97
US government bonds	0.12	0.32	0.47	-0.05	-0.06	-0.06	0.09	0.23	0.35
US corporate bonds	0.18	0.21	0.20	0.03	0.02	0.07	0.01	0.05	0.01
World ex-US government bonds	0.16	0.27	0.38	-0.01	-0.02	-0.03	0.06	0.15	0.22
World ex-US corporate bonds	0.02	0.23	0.46	0.02	0.00	0.16	-0.06	0.14	-0.67
World private equity	0.64	-0.02	-1.26	0.57	0.54	1.38	-0.59	-0.84	-2.47
World real estate	0.53	-0.03	-1.06	0.42	0.43	1.02	-0.44	-0.76	-2.07
World commodities	0.21	-0.19	-0.76	0.37	0.37	0.76	-0.42	-0.43	-0.84
World hedge funds	0.14	-0.03	-0.30	0.11	0.12	0.25	-0.12	-0.20	-0.45
World infrastructure	0.33	-0.02	-0.68	0.28	0.28	0.68	-0.30	-0.42	-1.14

Source: Risk.net; analytics provided by Sapiat

Perhaps more striking than the worst-case falls is the sheer spread of opinion between participants: figure 2 showcases the range of expected portfolio impacts for each of the regimes. Forecasts for regime one show a huge range, between a near-25% decline and the lower bound, and a 6% return, for optimists in the survey (see figure 2).

This wide distribution of returns is to be expected, says Donovan – who previously led Imperial College Business School’s Centre for Climate Finance and Investment – the spread is indicative of a good deal of justified uncertainty among respondents.

“The width of that distribution is no surprise, because nobody knows what the effect of a very rapid rise in a global carbon price would be,” Donovan says. “It’s indicative of a lot of guesses, some of which are going to be really well-formed, and some [of which are] just throwing darts.”

While the >\$120 regime sees the steepest drops in the dummy portfolio’s assets, the more moderate \$60–120 regime sees its own unappetising declines; cash holdings take a beating, with only China equities making a positive return, and world commodities sink to -0.19%. In

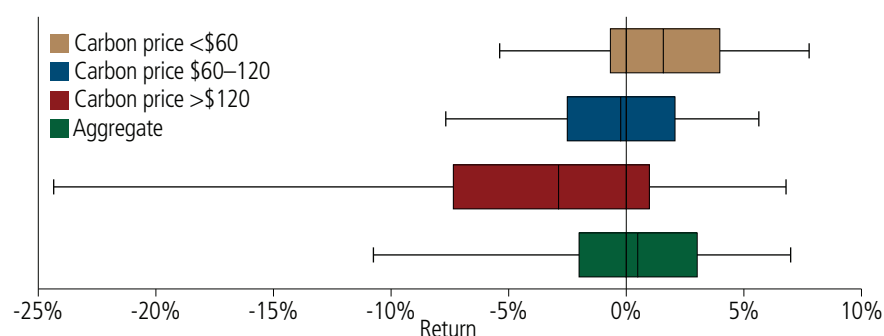
such a scenario, Donovan says, you might expect to see investors making cautious commodity bets and looking for ways out of sub-classes considered to be less substitutable.

“You have lots of potential dispersion within each sector,” he says. “You could think about steel and lumber being fungible in some construction settings; coal and fossil gas as a long-short; there are a number of long-short pairings. This is probably

why US equities are highly negative [in the results],” Donovan adds. “Investors are able to understand when an entire economy or an entire benchmark is heavily weighted towards carbon-intensive activities. At a macro level, you sell the entire benchmark” (see figure 3).

Even the more moderate rise in carbon prices seen under regime two might cause alarm for holders of certain assets. In sectoral analysis

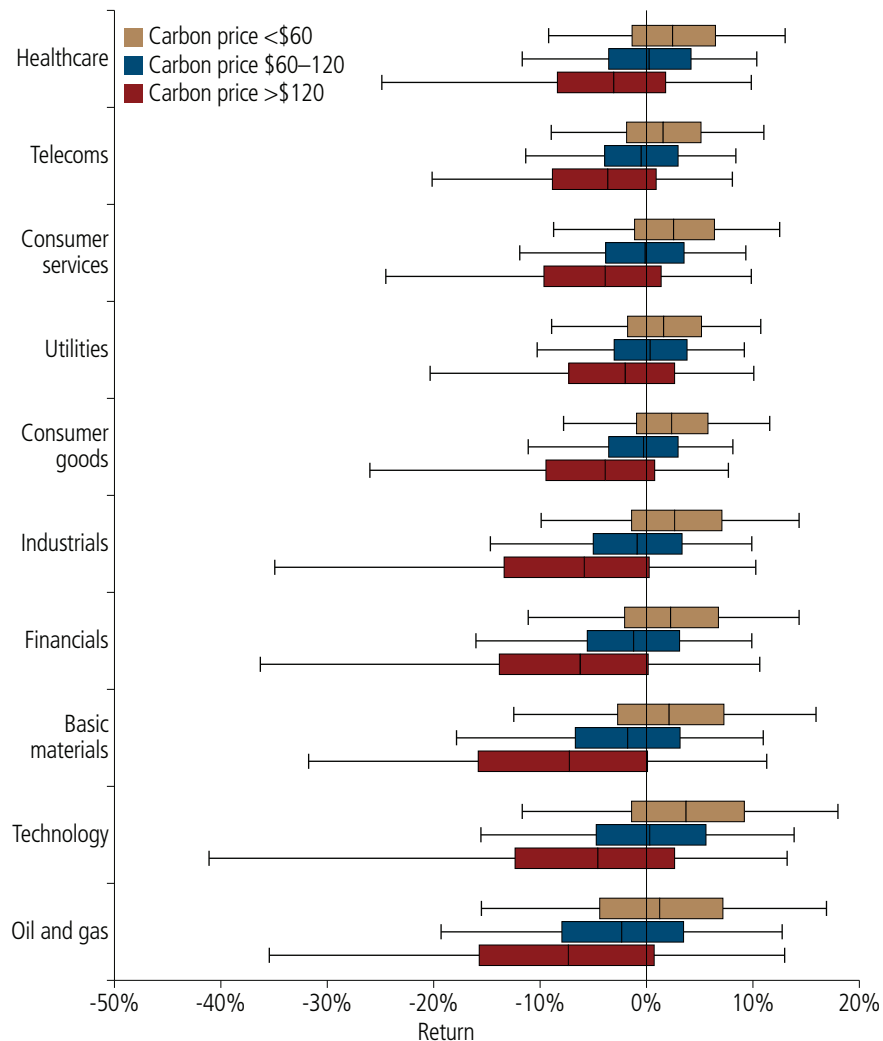
## 2 Portfolio expectation by carbon price



Source: Risk.net; analytics provided by Sapiat



### 3 Global equity sectors by carbon regime



Source: Risk.net; analytics provided by Sapiat

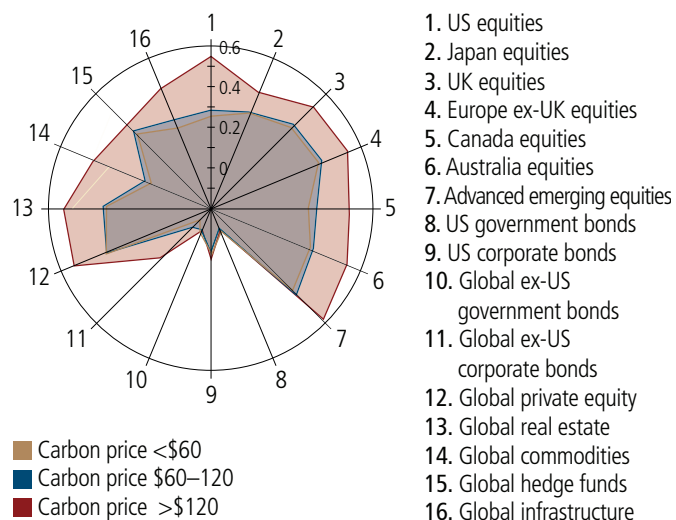
provided by Sapiat, a number of interesting distributions are visible – the most dramatic tails belong to the >\$120 scenario, but the \$60–120 regime isn't without its share of significant movements. Hits to equity in various sectors could result in the middle scenario, the exercise suggests, with the most pronounced dip seen – unsurprisingly – in oil and gas, which could witness contribution to portfolio returns as low as -19%. Industrial equity could also fall sharply, some respondents said, as could financials and tech.

Conversely, however, some predict modest gains could await investors in oil and gas equity, the analysis suggests. Peak projected contribution to returns for the sector in both the \$60–120 and >\$120 scenario stay above 10%, suggesting that some respondents, at least, have high confidence in the performance of carbon-intensive equity even in a world where carbon is expensive.

Such a range of views could indicate turmoil to come across the commodities complex, says John Scott, head of sustainability risk at Zurich Insurance Group.

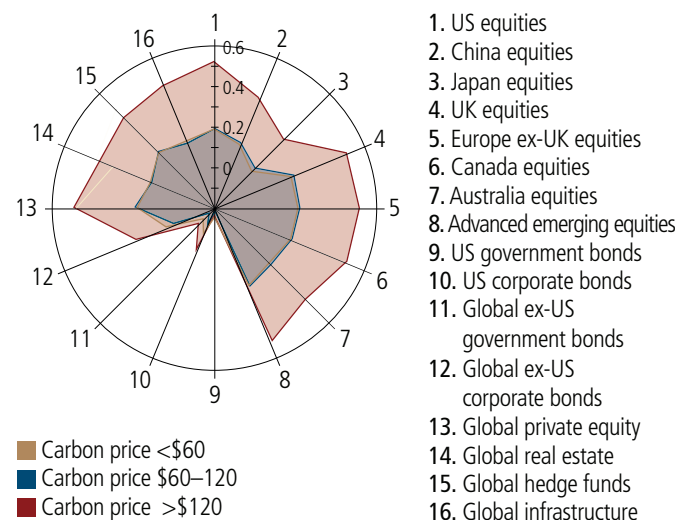
"I think what we should expect to see – if we get the policies that drive an increase in carbon prices, and substitution and change in all these different sectors and services – is quite a lot of energy price volatility," he says. "As time goes on, it becomes clearer that it's unlikely that we're going to have a managed, low-volatility transition, and I think this is what your survey is revealing: we're not going to get a global transition in all these sectors in anything other than a disorderly fashion. It's a competitive world, different markets are doing different things and it's very unlikely that everyone's going to do it all together."

### 4 Correlation to China commodities



Source: Risk.net; analytics provided by Sapiat

### 5 Correlation to world commodities



Source: Risk.net; analytics provided by Sapiat



The volatility seen in the third regime is a substantial 15.66, compared with 7.03 in the \$60–120 regime and 7.15 in the sub-\$60 regime. In the highly volatile third regime, the healthcare and utilities sectors, while giving negative returns, perform the least badly.

Bonds fair much better across all scenarios than equities, notes Tim Wilding, Sapiat's head of research. "Interestingly, the volatility of the moderate rise scenario is lower than the other two, and the mean higher than the <\$60 carbon price scenario, suggesting strong confidence in the improved performance of bonds in this scenario."

Sapiat's analysis also reveals interesting correlations between some asset classes. The China equities class, for example, exhibits only a very limited relationship with the other assets held in the portfolio under regimes one – \$60 – and two, \$60–120. A very mild positive correlation is found between it and the other equity types – spanning Australia, Canada, Europe ex-UK, Japan, UK, US and advanced emerging – as well as world private, equity, real estate, commodities, hedge funds and infrastructure, across all three scenarios (see figure 4).

China equities are negatively correlated with some bond classes, but these correlations are still

slight. A very small negative correlation is found between it, US government bonds and world ex-US government bonds under all regimes; in the third scenario alone, a positive correlation emerges between it and the corporate bonds types. The most significant positive correlations are found in the third and most extreme regime, where carbon prices go above \$120; there, China equities have a 0.38 positive correlation with advanced emerging equities, and 0.35 with both Europe ex-UK equities, world private equity and world real estate.

Similar correlations can be seen to world commodities. The class is negatively correlated to three bond types – US government bonds, US corporate bonds and world ex-US government bonds – in most instances. In the >\$120 regime, however, the correlation between world commodities and US corporate bonds turns slightly positive, reaching 0.06. As with China equities, world commodities' positive correlations to the rest of the portfolio increase with the extremity of the regime. Its correlation to advanced emerging equities, for example, is 0.23 under regime one, 0.24 under regime two and 0.51 under regime three.

In *Risk.net*'s last crowd-sourced scenario exercise, focusing on inflation, China equities tended to perform well in cases where other asset classes

began to struggle. In the highest inflation regime, for instance, the class exhibited its strongest returns, while the rest of the portfolio – except for world commodities – slumped into the negative (see figure 5).

So just how likely are carbon pricing jumps like the ones seen in the scenarios? While calls for higher costs on carbon emissions have intensified in the run-up to COP26, influential voices in the financial community have been forecasting a rise for some time.

In June of last year, the Network for Greening the Financial System – a consortium of the world's central banks – published scenarios indicating an average universal carbon price of \$100/tCO<sub>2</sub> would need to be set by 2030 for a decent chance of limiting global warming.<sup>1</sup> And the Bank of England's flagship climate stress test contains an "early action" scenario that sees the price reaching \$900/tCO<sub>2</sub> in the UK by 2050. In the "late action" scenario, it climbs above \$1,000 by the same date.

Few have predicted a price of more than \$100/tCO<sub>2</sub> by the end of 2021 – but real-life medium-term trends, however, suggest such a figure isn't that far off: Ember's price per tonne (EUR) was around €33 at the beginning of the year, and now sits at close to €59. If the price continues to increase at the same

## HOW THE RESULTS WERE COMPILED

During October, *Risk.net* asked roughly 50 of its readers what they thought would happen to a series of leading financial indicators during the final quarter of 2021, under three different carbon price regimes: little or no increase in the price of emitting a tonne of carbon, with IHS Markit's index remaining under \$60; a moderate rise, up to \$120; and a sharp increase, above \$120. The scenarios, built by Sapiat, were modelled from these anonymised forecasts. Here, the firm gives a brief insight into its methodology.

Common to all crowd-sourced scenarios is the assumption that forecasts from each individual respondent carry bias and uncertainty, but that their effects can be removed when using a large set of responses.

Sapiat applied the following settings during scenario construction:

- **Mean return.** Where the mean return is being forecast, each forecast is treated as independent, implying individual forecast errors are assumed to be diversified. This reduction of errors is in line with the so-called 'wisdom of crowds' (F Galton, 1907).
- **Variance matrix.** Since the respondents are assumed to have a good understanding of the context of inflation regimes and the impact on all inflation variables, we use the range of forecasts to estimate a variance matrix across respondents within each regime scenario.
- **Scenario combination.** Finally, a combined estimate of the mean and the variance is set from the combination of all the scenarios. Each of the forecasts for a particular inflation scenario are weighted by the respondents' probability estimate for that inflation scenario. These predictions are then adjusted using the

forecast means and variance matrix from each inflation scenario before being weighted by the average probability of each scenario and aggregated together to get an overall forecast of future conditions.

The scenarios are then simulated over a single period forecast, ending December 31. Sapiat used the following proprietary engines in the simulation:

- **A regime model**, which identifies probabilistically which regime the markets are currently following, and the likelihood of transitioning to any of the other regimes over the simulation horizon.
- **A simulation model**, in which return paths are simulated by rigorously combining the forecast scenarios and the regime modelling over time. The resulting scenario distribution allows the calculation of scenario risk measures (including typical stress-test outputs for downside risk), but also plausible estimates for portfolio return.
 

Where the forecasts include stress scenarios (defined as scenarios with large or unprecedented shocks), the resulting distributions include the simulated results of such shocks, and so the downside risk metrics for any portfolio may be calculated directly from the scenario distribution.
- **Interpretation.** Sapiat employs expert judgement when turning audience views into future return scenarios. Since scenario distributions are simulated for all asset classes globally, and not just for those for which forecasts have been provided, the framework can be useful in modelling the returns of investment portfolios over multiple time horizons.



rate – that is, by roughly 78% around every 11 months – we could expect an approximate European carbon price of more than €100 by October 2022.

“A lot would depend on what decisions are taken in the next two weeks at the COP,” says Zurich’s Scott.

He says it’s certainly possible that governments working in tandem could raise the price of carbon to the level in the most extreme scenario: “If governments everywhere suddenly agree to create some economic driver – recognising that the International Energy Agency says you don’t have a material impact on economic decisions unless you’re in the range of \$80 to \$120 – and push tariffs or levies all together, I think there’s a chance.”

Still, as part of their COP26 negotiating arsenal, European legislators have proposed an aggressive carbon border tax, which would slap tariffs on goods entering the EU from jurisdictions that don’t effectively tax carbon – which, according to the IMF, account for some 80% of global emissions.<sup>2,3</sup> A uniform carbon price would apply uniformly for all emissions, globally. It could take several forms: a globally-agreed straightforward tax on carbon emissions; uniform tariffs on goods imported from regions that don’t impose pollution permits into those that do; or a floor on the price of carbon permits, which are already in place in some regions globally.

With a phase-in proposed from the end of next year, should the bill pass in its current ambitious form – or more likely, force governments from other nations to shore up their own emissions cap or tax regimes in response, for fear their exports become uncompetitive in Europe – the global cost of emitting a tonne of carbon could spike dramatically.

Achieving this aim would be no mean feat: according to IMF estimates, some 80% of global emissions are unpriced.

And as Zurich’s Scott points out, ‘possible’ doesn’t equate to ‘likely’: after nearly 30 years of COPs since the Kyoto Agreement, world leaders have yet to come to a decision that could yield such an impact. ■

*Previously published on Risk.net*

<sup>1</sup> NGFS (June 2020), NGFS climate scenarios for central banks and supervisors, [www.bit.ly/3odEwRq](http://www.bit.ly/3odEwRq)

<sup>2</sup> EC (July 2021), Carbon border adjustment mechanism: questions and answers, [www.bit.ly/3DeAcYA](http://www.bit.ly/3DeAcYA)

<sup>3</sup> V Gaspar and I Parry (June 2021), A proposal to scale up global carbon pricing, IMF Blog, [www.bit.ly/30pHpXg](http://www.bit.ly/30pHpXg)

This article forms part of Risk.net’s series of crowd-sourced scenario-generation exercises. Download a PDF of the full results at [www.risk.net/media/download/1072201](http://www.risk.net/media/download/1072201)

COP26 could be the last chance for co-ordinated action to avoid a rise in global temperatures above 1.5°C, which means factoring the cost of carbon pollution into global economic activity





# The impact of European gas prices on climate goals

As governments increase their focus on climate change following the UN Climate Change Conference, COP26, ZE Power asks whether high gas prices in Europe could derail decarbonisation efforts

Record-high energy prices have taken their toll on industries throughout Europe – especially in the UK, where a raft of smaller power retailers have gone out of business in recent months. The steep increase in gas prices in 2021 has also lessened the incentive for many power plants to move away from coal, threatening Europe's ability to meet its climate targets.

In this article, ZE Power presents an analysis of the situation, looking at the causes of high gas prices, the outlook for gas, coal and carbon prices, and the impact of the interplay between these on climate goals going forward.

Europe has struggled this year to import enough natural gas to refill its stores and run its power plants amid a global recovery from the impact of the Covid-19 pandemic.

Gas prices for next-month delivery at the Dutch Title Transfer Facility (TTF), the regional benchmark, rose to record levels of more than €120 per megawatt hour (MWh) in early October, from €17.90 at the start of 2021, as regional suppliers sought to replenish storages ahead of the coming winter.

Soaring gas prices are also making electricity more expensive, particularly as more and more coal-fired plants are being shut down to help the bloc achieve its climate targets.

German baseload electricity for delivery in 2022 also leaped to more than €180/MWh in early October, after having started the year at €52/MWh. This sudden and steep increase caused mayhem in the market as traders faced huge margin calls on open positions, with many forced to dump their positions to remain solvent.

The rally reached a crescendo in early October, when prices were moving by as much as 30% within a single session, before Russian president Vladimir Putin appeared to trigger a widespread sell-off when he pledged that Russia would help moderate energy prices by raising gas supplies.

**"The gradual phase-out of over 50 gigawatts of nuclear-, coal- and lignite-fired power generation capacity creates additional market space for gas-fired power plants"**

International Energy Agency

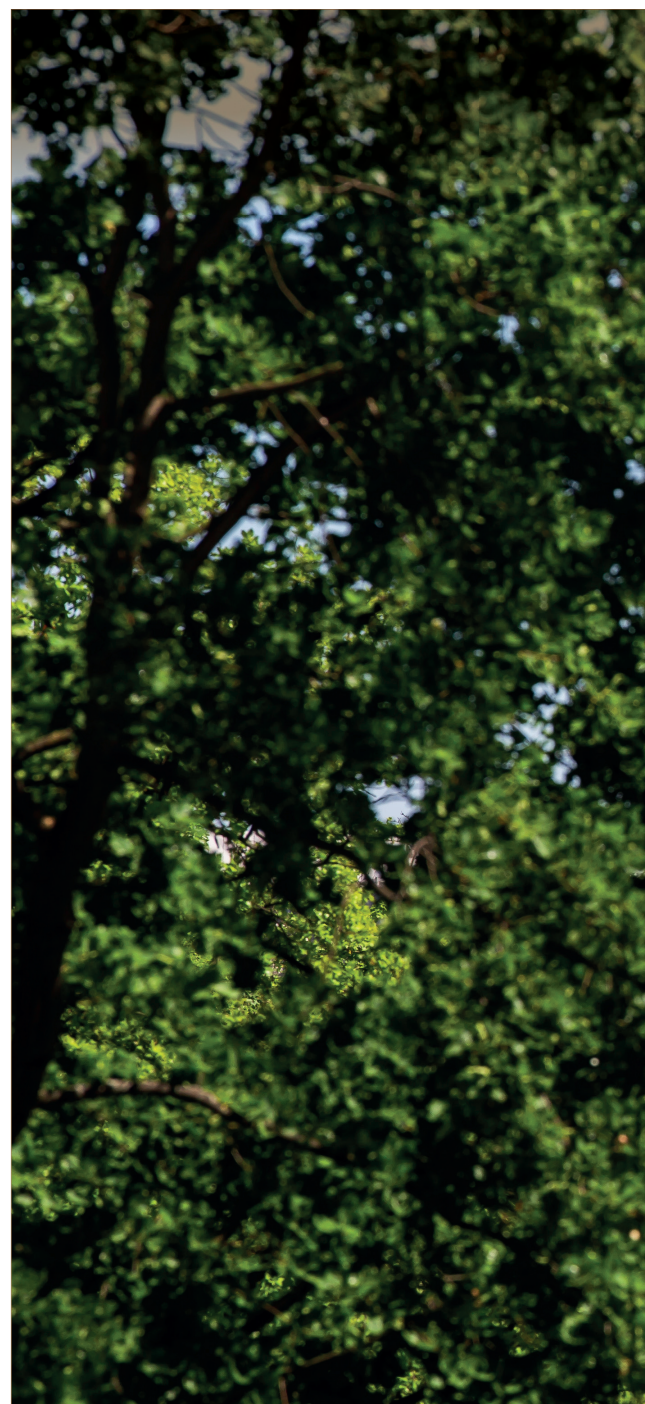
## How did it start?

An extended winter heating season in 2020–21 left storages in Europe at their lowest end-of-winter levels since 2018, according to data from Gas Infrastructure Europe (GIE), and stocks have not been replenished as quickly as normal. In August, gas storages in the European Union were at their lowest level for that time of year since 2013, GIE data shows. Even by early October, storages were still 20% lower than at the same time in 2020 and 2019.

Europe's shortfall stems from a combination of declining local production, a squeeze on imports from Russia and strong competition for liquefied natural gas (LNG) from other regions.

According to the European Commission (EC), regional LNG production declined 11% to 13.8 billion cubic metres in the first quarter of 2021, compared with a year earlier, as output from Netherlands' giant Groningen gas field declined ahead of its eventual decommissioning in 2022.

Consumption in Q1 rose 7.6% year-on-year to 141.8 billion cubic metres, while net imports dropped by 3% to 78.5 billion cubic metres. LNG supplies fell by 29% from the same period in 2020, partially offset by a 9% hike in pipeline supplies from Russia and a jump of 141% in flows from Algeria.





### Imports drop

The largest single supplier of gas to Europe is Russia, which ships around half the EU's imports.

While long-term contracted volumes remained broadly stable in the early part of this year, shorter-term spot sales declined sharply, reflecting rising market prices, according to the EC.

"Gazprom preferred to rely on withdrawals from its own storages in EU territories to supply its clients, given the average cost of injected gas was much lower compared to hub prices in Q1 2021," the EC reported.

Russian gas is shipped to Europe via a network of pipelines across the Baltic Sea, through Belarus, Ukraine, the Black Sea and Turkey. Russian state-owned producer Gazprom is also leading a

consortium of companies that recently completed Nord Stream 2 – a second pipeline across the Baltic Sea.

While the new pipeline is now ready, it cannot deliver gas to customers until it has received all relevant approvals and certifications from German, Danish and EU regulators – a process likely to last the rest of the year.

The European market has been closely monitoring the progress of the Nord Stream 2 project, which was originally scheduled to complete in 2020.

The pipeline is intended to boost the EU's security of supply but has encountered stiff opposition from the US government, as well as Ukrainian interests, who see it as increasing Europe's reliance on Russia.

German, Danish and EU regulators must approve the Nord Stream 2 pipeline before it can deliver gas to customers

Even though Nord Stream 2's promoters say the project will complement, rather than replace, much of Europe's existing supplies – including volumes that Russia has sent through Ukraine – the EC reported the volume of Russian gas transhipped through Ukraine plunged by 83% in Q1.

Trading sources reported that Gazprom declined to book additional pipeline capacity beyond its contracted commitments throughout Q2 and Q3, and has yet to agree a new long-term contract with Ukrainian pipeline owner Ukrtransgaz for shipments after 2024.

According to some analysts, Russia's domestic stockpiles are also at unseasonably low levels, meaning potential export volumes are being diverted into Russian storages.

Analysts at Independent Commodity Intelligence Services (ICIS) estimated that, in April 2021 "[Russian] stocks were just 19% full, rather than the average of 39% as witnessed in the Aprils of 2017–19."<sup>1</sup>

The EU also imports significant volumes of gas through pipelines from Algeria, but a dispute between Algeria and its neighbour Morocco threatens to reduce supply from the south.

Growing tensions between Algeria and Morocco have led to delays in the two renewing an agreement for Algerian gas to move to Europe through the Gazoduc Maghreb–Europe (GME) pipeline, which runs through Morocco to Spain. GME passed into Moroccan ownership on November 1, and the existing transshipment agreement expired on October 31.

Algeria's state-owned producer Sonatrach is now working to boost capacity through its own Medgaz pipeline to Europe by 25% before the end of this year. However, experts warn that even this increase will not fully replace the volumes lost through the GME pipeline.

### LNG switches to Asia

In addition to pipeline gas, Europe has historically received a considerable volume of LNG from exporters in the US, the Middle East and Africa. However, the fast-growing market for LNG has led to more dynamic pricing, and European buyers now have to compete with Asian consumers for available supply.

Low stocks in Asia after last winter, coupled with rapid increases in demand, have led to spiralling price competition as buyers scour the market for available cargoes. Shipments of LNG from the US Gulf Coast, the closest source of the chilled gas to Europe, have bypassed the EU for much of this year in favour of higher returns in Asian markets.

As a result, Europe faces the coming winter with gas stocks at their lowest for a number of years, while demand has increased as more power is generated with the fuel.





### What happens if gas stays tight?

We are already seeing the result of the gas shortage. Utilities are burning as much coal as possible to generate power to divert gas into storage for domestic heating through the winter.

Coal's renaissance in the latter half of this year has also tightened that market, and prices have begun to jump as European buyers compete with other buyers such as China for available supplies. One German plant even ran out of coal supply and was forced to suspend operations in early October.

However, coal generation is shrinking as EU member states follow through on pledges to phase out use of the polluting fuel. According to the Beyond Coal campaign, at least 13 coal-fired plants were scheduled to close this year, as well as three German units that will shut in December after winning compensation in an April government tender.

Falling coal generation means some natural gas power capacity needs to operate at the margins, and it is these plants that are setting the high prices for natural gas and electricity in Europe at the moment.

The gas crunch couldn't come at a worse time for the region's leading economy, as the country also prepares to close three of its six remaining nuclear plants at the end of this year. Previous closures have led to brownouts and high electricity prices.

Poor renewable generation has also added to the problem. Data from the Fraunhofer Institute shows that German wind, solar, hydro and biomass generation in the nine months to September 2021 has fallen by 7% from 2020. Coal output has grown 22% year-on-year, while gas generation is down 8%.<sup>2</sup>

Power and gas traders have all absorbed this and other data; prices for winter energy are at record levels and are likely to remain high through to spring.

### Carbon's role

While gas prices were soaring, EU carbon allowances nearly doubled in 2021, reaching a peak of €65.77 shortly before joining the energy market's sharp sell-off. As a consequence of energy price moves, gas-fired electricity generation is now less profitable than coal, even after the increase in carbon prices.

Gas typically generates half as much CO<sub>2</sub> as coal per unit of power generated so, as the price of natural gas rose far quicker than that of coal this year, the price of carbon kept pace to maintain gas primacy in the generation merit order.

However, this summer it became clear Europe needs more gas in storage rather than burning it for power. To ensure gas flowed to storage rather than power, gas prices had to rise sufficiently so coal became comparatively more profitable as an electricity fuel.

Indexing the market prices shows that carbon and gas prices began to diverge in July, as Dutch hub TTF prices began to rise very quickly and carbon rallied more moderately. In contrast, coal prices only began outstripping carbon towards the end of September (see figure 1).

The price moves meant, for power generated next year, coal became more profitable than gas at the end of September – since then the so-called clean dark spread has jumped to as much as €42/MWh, while the gas margin, known as the clean spark spread, has fallen into negative territory (see figure 2).

### What can the gas market do?

In the short term, the lack of supply may only be alleviated when Russian shipments increase, either by higher transshipments through Ukraine and other interconnectors, or when the Nord Stream 2 pipeline begins operation. Additional supply could come in the form of LNG, but this would require European prices to match or exceed those of Asia, which is currently receiving the lion's share of available cargoes.

And the long-term balance is likely to remain tight as consumption in Europe is expected to continue to rise. The International Energy Agency (IEA) predicted 2021 demand would increase by 3%.<sup>3</sup> However, the rapid growth of renewables is set to eat into gas' growth potential, it adds.

"European gas demand is expected to remain stable through the period [2021–25]," the IEA said in a separate report.<sup>4</sup> "The gradual phase-out of over 50 gigawatts of nuclear-, coal- and lignite-fired power generation capacity creates additional market space for gas-fired power plants."

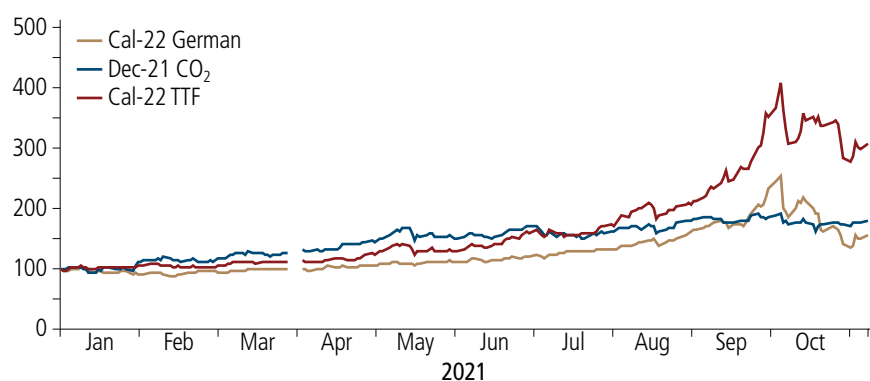
But gas' growth "is limited by the rapid expansion of renewable power generation, set to increase by almost 30% over the medium term".

And it won't be just renewables that limit gas' growth. Some analysts are predicting carbon permit prices in Europe to exceed €90 by the end of the decade, as the bloc tightens the limit on greenhouse gas emissions as part of its goal to cut CO<sub>2</sub> by 55% from 1990 levels by 2030.

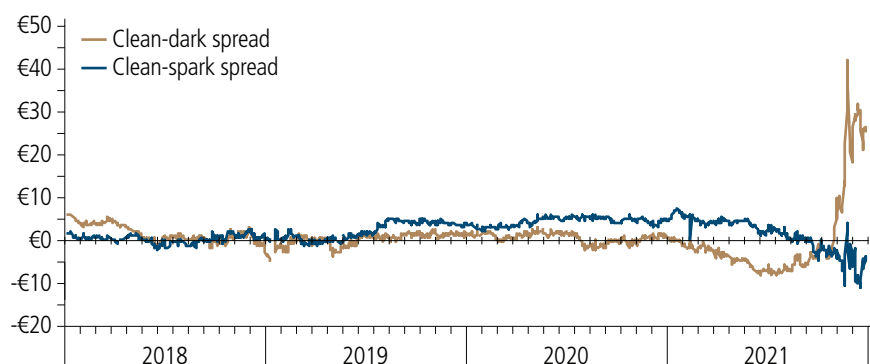
Higher CO<sub>2</sub> prices will bring yet more low- or zero-carbon alternatives into play at the expense of gas, experts say, including hydrogen as a process fuel for steel-, cement-making and petrochemicals.

Long-range projections envisage a European economy in which natural gas has only a marginal role, but the experience of the past few months suggests that there are many more twists and turns before we get there. ■

1 Carbon, gas and coal price index 2021



2 Calendar 2022 German clean dark, clean spark spreads (38% coal, 50% gas)



<sup>1</sup> T Marzec-Manser (August 2021), ICIS analyst view: Gazprom's inability to supply or unwillingness to deliver?, [www.bit.ly/3H8rddu](http://www.bit.ly/3H8rddu)

<sup>2</sup> Energy Charts (September 2021), Net public electricity generation in Germany in week 45, 2021, [www.bit.ly/2Y5ffja](http://www.bit.ly/2Y5ffja)

<sup>3</sup> IEA (April 2021), Gas market report: Q2 2021, [www.bit.ly/3wrScvM](http://www.bit.ly/3wrScvM)

<sup>4</sup> IEA (June 2020), Gas: 2020, [www.bit.ly/31DZDVf](http://www.bit.ly/31DZDVf)

# Weather, or not

## Is climate risk just part of credit risk?

Practitioners are divided on whether climate risk can fit into existing credit risk weights. By Samuel Wilkes

**W**hen regulators face a new risk in the banking sector, their natural response is to decide how much capital banks need to hold against it. The largest emerging risk is from climate change: either the physical risks of extreme weather events and rising sea levels, or the transition risk of policy changes to clamp down on carbon emissions. Both will potentially cause defaults to flow through bank loan books.

The Basel Committee on Banking Supervision has already begun work on how to incorporate climate risk into prudential rules, and two sources believe Basel could produce a paper on this before the end of 2021.

"I'll be frank with you, we are doing work on this topic and thinking through about it and we hopefully are going to be able to say something about it when we have concluded this thinking," Victoria Saporta, the Bank of England's executive director of prudential policy, told an online webinar hosted by the Institute of International Finance on September 13.

### Need to know

- The severity and frequency of climate-related risks are expected to increase in the future.
- The credit risk capital framework doesn't adequately capture these risks yet, but it will need to if banks are to be protected against carbon-intensive clients becoming non-viable due to policy responses, or the impact of extreme weather events.
- Regulators could create a climate risk factor that lowers requirements for greener companies or raises them for heavy emitters.
- Alternatively, they could require qualitative modifications to existing credit risk capital requirements, to incorporate climate risk into calculations of probability of default and loss given default.
- In either case, there are limits on the precision of the numbers produced because of the unprecedented nature of the risks themselves.

But there's one obvious challenge: the existing framework for assessing credit risk – by far the largest part of banks' balance sheets – relies heavily on historical data.

Michel van den Berg, a sustainability adviser who has worked with Dutch banks including Rabobank and ING, says transition risk has barely begun to materialise. Physical risk has developed further, but is still at an early stage. That means historical data is not a particularly useful guide to future risks.

"We can only run hypothetical scenarios that lay out how this will ripple through the economy," says van den Berg.

Experts see two different responses to this, but neither is completely free from drawbacks. The first is to incorporate climate risk into the existing credit risk capital rules. As defaults increase, the data for recalibrating risk-weighted assets (RWAs) will gradually become available. In the meantime, banks and regulators will need to use expert judgement to make qualitative adjustments to RWAs in anticipation of future losses.

"I believe the bank capital framework we have – where we have policies to determine probabilities of default [PD] and loss given default [LGD] – should be made to accommodate climate risk, even though [it] can't be modelled in the same way we model traditional credit risk," says van den Berg.

But others believe more drastic alterations to the capital framework are needed, especially as existing RWAs tend to focus on short-term risks. This alternative could involve a separate set of specific climate-driven factors, add-ons or discounts being used to increase or decrease banks' total RWAs.

"The question one can ask is: should climate risk be in PD or LGD estimates themselves for the internal approaches, and credit ratings in the standardised approach [SA], or should it be in the risk weightings as a final 'adjustment at check-out' type factor?" asks Judson Berkey, head of sustainability regulatory strategy at UBS.

Market participants are hoping the Basel Committee will ultimately take a view on this choice, and provide more detail on how to implement whichever path it chooses.

However, both approaches would still face the data challenge. Robert Begbie, chief executive of NatWest Markets, warned at a press briefing on October 4 that it will take time to amass the appropriate data and methodology.

"Historically, where capital rules have been changed or capital add-ons introduced, it is normally based on having good data, good stress-test analyses of banks' balance sheets, and that is very evolutionary," said Begbie.

"So [if] you are going to do capital add-ons at some point, it will need to be based on rigorous assessment, because otherwise you could have unintended consequences if you introduce them too early."

Some climate risk experts, however, have a greater sense of urgency, and fear that waiting for data will only delay the banking sector's necessary response, inhibiting the financing of transition to a low-carbon economy. That implies the need for a make do and mend approach to climate risk capital charges for the time being.

### Trust your judgement

Banks must calculate the risk arising from borrowers defaulting on loans or bonds either through their own models, or through the SA that uses ratings from credit rating agencies or regulator-set risk weights. In the internal ratings based approach (IRB), PD and LGD are the key model inputs.

Three sources at banks and consultancies believe regulators don't need to drastically change the framework to reflect climate risk, as banks can incorporate the risks through the IRB approach.

But there's a hitch: IRB models typically look for default risks only over the short term. They will struggle to capture the risks climate change can pose for a borrower, since those consequences may take decades to materialise fully.

PD models, for example, only estimate the likelihood of default over a one-year period. That would only be appropriate for certain short-term lending that banks could manage down rapidly – van den Berg gives the example of trade finance.



The way around this obstacle is to adjust IRB outputs with qualitative judgements. James Belmont, a partner and climate risk lead at consultancy Baringa, says those assessments give banks the chance to scrutinise transition plans and alter the internal credit scores they give to counterparties, if they feel the raw model output does not reflect the embedded physical or transition risk of that borrower.

"You can capture climate risk in your Pillar 1 RWAs through embedding climate risks within the annual credit reviews," says Belmont. "Where this results in revisions to the internal credit rating that the bank assigns to the counterparty, this would naturally feed through into RWAs, so that is a more organic way of doing it."

Of course, supervisors will want to take a view on the accuracy of the assessments banks make for each counterparty. This is where the work of regulatory initiatives such as the Network for Greening the Financial System (NGFS) can come into play. The NGFS has already produced a set of climate change scenarios designed to chart macrofinancial pathways to different temperature targets.

"There's enough tools out there to be able to build up a decent opinion of the level of vulnerability to these risks, which you can then factor into your default estimates," says the head of climate risk at a global investment bank. Regulators can weigh an individual bank's qualitative assessment against international benchmarks like the NGFS scenarios. If they find it wanting in terms of undervaluing the risk, Belmont suggests the Pillar 2 supervisory add-ons process already in use in the UK and European Union is the obvious path to correct the problem. He says regulators could apply a top-down assumption that is "more draconian" than the bank's own judgement.

"Regulators have to have some way of enforcing that minimum standard, and an incentive mechanism for doing that," says Belmont.

### Don't trust your judgement

However, the head of climate risk at the global investment bank notes that the NGFS scenarios themselves may not always be as rigorous as necessary, with some of the predicted medium-term events already playing out today. For example, under the benign scenario of an early transition that limits the ultimate temperature rise to 1.7 degrees Celsius, carbon prices are assumed to rise to \$70 per tonne in 2030 and \$100 per tonne in 2040.

In reality, end-of-day futures prices for allowances companies based in the European Union must possess if they want to release emissions have almost doubled in price this year, trading at more than €60 (\$70) per tonne since September 2021, according to data sourced from the Intercontinental Exchange. UK allowances peaked at £76 (\$101) on September 29.



Consequently, regulator-set scenarios and Pillar 2 capital add-ons do not change the fundamental difficulty of this approach. Supervisors are used to heavily scrutinising the accuracy of bank risk models – and therefore their total capital requirements. Two sources say the qualitative add-ons to IRB could be too fuzzy for supervisors to swallow.

One banker points to the huge effort that both the regulator and the banks put into the European Central Bank's targeted review of internal models (Trim).

"There is an inherent contradiction here between on the one hand the Trim-like exercises that seek to establish a high burden of statistical validity for PD modelling, and on the other hand the push to include more qualitative ESG – not just climate – information in capital and pricing, which is hardly ever going to pass statistical scrutiny," says a head of capital management at a UK bank.

A head of modelling at a European investment bank also warns that any attempt to incorporate climate information into PD models themselves will damage the integrity and explainability of the models.

"If you're doing this for a time-horizon of 25 years, the amount of error will be absolutely ridiculous and the validity of these models will be put in question," says the head of modelling. "My models have to be auditable, they have to be valid and they will not [be], so that is a problem."

### Standardised approach

If regulators are not inclined to trust banks to incorporate climate risk into their IRB models, there is always the SA.

For corporate credit risk, banks can either derive standardised RWAs from the ratings assigned by a credit rating agency according to a regulator-set matrix, or – in jurisdictions that do not allow the use of external ratings – the regulator sets generic RWAs by type of exposure. Although the largest banks that account for the bulk of lending rely on internal models, the amount of RWAs generated by the SA is still relevant, because an output floor will limit the discount banks can derive from internal models to 72.5% of the RWAs generated by SAs.

External credit ratings run into some of the same problems as the IRB approach. Ratings agencies typically use short-term forecasts to produce a rating that reflects the ability of the issuer to repay its debt over the short term, and rely on reviewing that rating on a regular basis. However, analysts say they do sometimes consider risks that are likely to materialise over the long term.

"It's much more difficult to predict something that's going to happen so far away," says Janine Dow, senior director at Fitch Ratings. "The greater the distance, the more difficult it is for credit analysts to forecast that and to include it in our financial projections, which often only go out two to three years."

The European Securities and Markets Authority (Esma) is currently looking into how environmental, social and governance (ESG) risks are systematically captured in credit ratings. According to the EU's renewed sustainable finance strategy, Esma must share its findings with the European Commission, which may then take action to ensure the ESG risks are systematically captured in credit ratings.

The situation for standardised credit RWAs not derived from external credit ratings is much worse. For example, EU lawmakers are mulling risk weights for unrated corporate exposures – those that don't tap into security markets and have little public information – that would simply be static. The same technique is already used for all corporate exposures in the US capital framework. Retail exposures such as mortgages are also simply sorted into fixed RWA buckets under the SA.

When regulators originally set these risk weights, climate change wasn't top of the agenda, and so hasn't been factored in.

"The risk weights on unrated exposures aren't granular," says Monsur Hussain, head of financial institutions research at Fitch Ratings. "Their granularity does improve to some degree in the final Basel III framework, but the unrated credit risk assessment for banks and corporates relies on backward-looking credit and governance-based factors."

### All change

For those who see these obstacles as insurmountable, the answer is to build a totally separate category of climate risk weights, in the form of add-ons or discounts to the existing framework.

A carbon penalising factor has been suggested, which would have an opposite effect to the EU's supporting factors for infrastructure projects and small and medium-sized enterprises, which give capital discounts to loans granted to those borrowers.

Pierre Monin, a senior fellow of the Council of Economic Policies, specifically favours increased RWAs on polluting assets. This would protect their capital adequacy from climate risk, and discourage investment in polluting assets, which would in turn reduce the financial sector's exposure to climate change transition risks.

"Central banks are saying climate risks are not really taken into account by financial markets, so there is a missing risk in a sense. The solution for missing risk is to increase the capital requirement rather than decrease it," says Monin. "By doing

that, you then also incentivise firms to transition, and a world which has transitioned to a low-carbon economy is the safest scenario for financial stability."

At the NatWest press briefing on October 4, the bank's head of climate and ESG capital markets Caroline Haas said there is already evidence of a 'greenium' – tighter pricing on green bonds, loans and project finance. Consequently, a risk-weight discount for green assets might risk creating an outright bubble, and a penalising factor for carbon-emitting assets would avoid that problem.

"The intent would be to have a higher capital requirement that then evolves down as companies or assets transition, versus just supporting the green efforts – but that enhances the complexity of all this," Haas said.

Monin says there is enough evidence to identify the companies most at risk of transition, as climate metric providers already offer such assessments. This means a risk-weight differential could be justified for transition risk, despite the lack of statistical evidence showing the exact impact it may have on default rates.

For physical risk, however, a recent study released by the University of Zurich finds substantial divergence among metric providers' scores.<sup>1</sup>

As a result, specific risk weights for exposure to climate risk wouldn't be any more accurate than adjustments to the IRB outputs.

"It is a kind of catch-22 situation: you probably could do a risk differential, but you don't have the underlying data or forward-looking analysis to support that," says Constance Usherwood, a director at industry group the Association for Financial Markets in Europe. "Our overarching principle is risk sensitivity and ensuring any treatment of a green or brown asset is consistent with the underlying risk."

But those advocating a quicker response to climate change say regulators and banks will just have to live with a lower level of accuracy.

"I think it could be simpler than the very precise formulas that are currently used for risk weights," says Monin. "If a regulator knows that a firm is very exposed to climate risk, then they should apply an extra add-on to the RWA."

Some in the industry sympathise with that improvised approach, if it helps banks to step up their response to the threat of climate change. The head of climate risk at the global investment bank observes: "You don't need to be too tied into trying to be pinpoint accurate – just look at things from a new direction of travel." ■

*Previously published on Risk.net*

<sup>1</sup> L Hain, J Köbel and M Leippold (September 2021), *Finance Research Letters*, Let's get physical: comparing metrics of physical climate risk, <https://bit.ly/3jFGnNr>





# Applying scenario analysis to climate risk

Matthew Lightwood, director, risk solutions at Conning, discusses the application of stochastic modelling with scenario analysis to quantify climate risk in a portfolio

Assessing the level of climate risk in a portfolio is now a top priority at a wide variety of businesses – from asset managers and banks to insurers, energy firms and the industrial sector. The question is clear: what impact does climate change and possible governmental policy action have on a firm's asset risk? Arriving at the answer, however, is a challenge with which risk management is still grappling.

Climate risk is unlike many other types of financial risk. There is little to no useful historical data, and many future developments in the world's response to climate change are both unknown and unknowable. Additionally, climate impacts on financial markets are likely to manifest as subtle changes over long periods of time. This point is not lost on regulators, and the idea of a term structure of risks is already a feature of the next generation of climate stress tests.

In cases where it is difficult to assign a probability to outcomes, scenario analysis is the tool of choice and has been adopted by many organisations for analysing climate risk. However, having a scenario to consider and actually assessing its impact on a portfolio are two different things. This feature considers the use of a stochastic model overlaid with a scenario analysis algorithm to quantify the possible risk impacts of one climate risk scenario.

## Applying stochastic modelling

This study uses an economic scenario generator to model two portfolios. Portfolio 1 consists of 70% global fixed income investments and 30% risk assets. Portfolio 2 is split 50/50 between fixed income and risk assets. A stochastic projection of the risk distribution is produced and analysed using the power of the cloud. A climate scenario, representing an orderly transition to a low-carbon economy over a 30-year future time horizon, is overlaid using an algorithm that allows the impact to be considered through time as well as on the whole risk distribution. Also considered is the impact from both transition risk and physical risk.

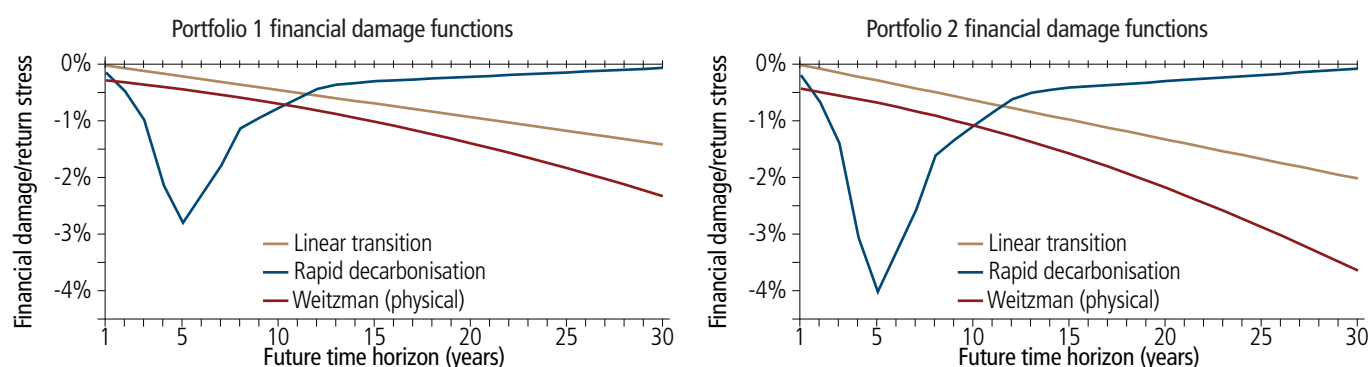
This scenario is a global scenario taken from the definition given by the UK Prudential Regulatory Authority in its 2019 exploratory exercise and represents the impact that might be expected if governments took policy actions that broadly align with the Paris Agreement on climate change at the end of the 30-year period. This involves a maximum temperature increase of below 2 degrees Celsius relative to pre-industrial levels and full greenhouse-gas neutrality beyond the 30-year horizon of the scenario. The assumptions of this scenario are based on the scenarios described in the Intergovernmental

Panel on Climate Change's (IPCC's) special report, *Global warming of 1.5°C*.<sup>1</sup>

Figure 1 considers two possible through-time paths with regard to the magnitude and timing of the future transition risk impacts or financial damage of the scenario. These are a linearly increasing damage scenario and a rapid decarbonisation scenario. In the latter scenario, the impact increases rapidly in the next 10 years, which can be seen as the peak stress of the blue line in figure 1, before falling back as markets reorder to absorb the structural changes that have taken place. For physical risk, a Weitzman-like damage function is assumed, one of the commonly used functions from the climate literature.

These scenarios are then applied to the output of the GEMS Economic Scenario Generator using an algorithm developed by Conning and a cloud-based scenario analysis tool, the Conning Climate Risk Analyzer. Figure 2 shows the effect through time of the scenarios on the mean market value of each portfolio and the 1% annual value-at-risk (VAR). The effect is expressed in terms of excess climate risk (ECR) defined as the change in the statistic relative to the current best estimate of risk and reward. A value of -1% in the mean, for instance, can be interpreted as saying that, conditional on this

1 Transition and physical damage functions for portfolio 1 and 2 under two transition scenarios



Prepared by Conning, Inc.

scenario playing out, it would be expected that the portfolio market value is 1% lower than our current best estimate. Figure 2 also illustrates the attribution of the ECR to transition risk (middle row) and physical risk (bottom row).

For both portfolios it is observed that the rapid decarbonisation scenario leads to larger impacts on risk and return at the shorter and medium time horizons. Over the full 30-year horizon it can be seen that the portfolios are relatively insensitive to the path the climate scenario takes through time. It is also observed that the scenario has a larger impact on risk than on mean return. For portfolio 1, the mean return is 5% lower under the rapid decarbonisation scenario than the current best estimate, while the 1% VAR has increased by nearly 6%. For portfolio 2, the differences are greater, with the mean return decreasing by approximately 7.5% while the 1% VAR increased by 9%. Considering the five-year horizon that might be used for Own Risk and Solvency Assessment reporting or analysis to form part of the Task Force on Climate-related Financial Disclosures or Principles for Responsible Investment disclosures, increases in risk of only 1.3% for portfolio 1 and 1.9% for portfolio 2 are observed under the rapid decarbonisation scenario. ■

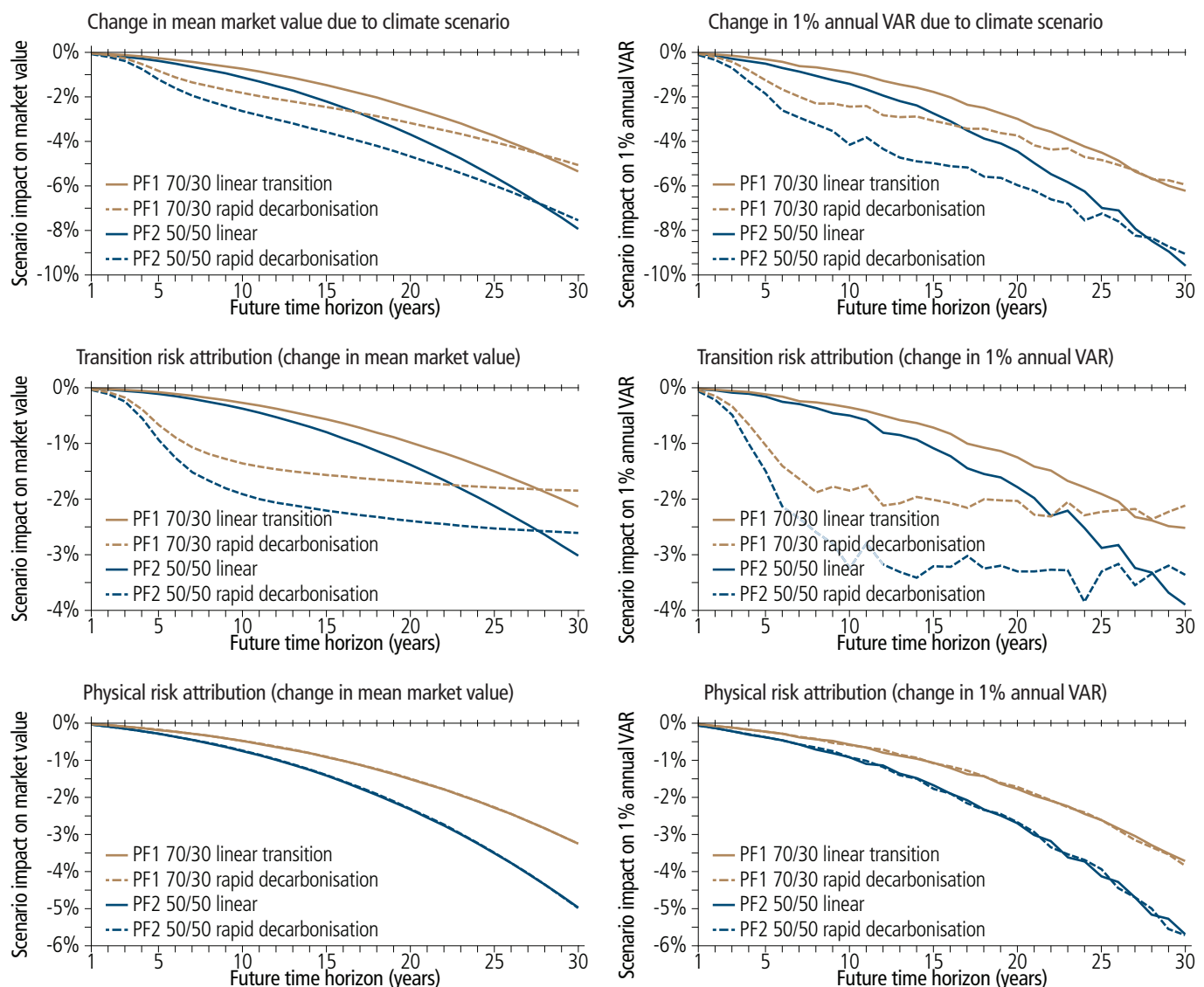


Matthew Lightwood is director, risk solutions at Conning

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<sup>1</sup> IPCC (2018), Global warming of 1.5 °C, [www.bit.ly/3AdoPh0](http://www.bit.ly/3AdoPh0)

## 2 Climate risk analysis using the Conning Climate Risk Analyzer software. The effect of scenario B on the mean market value (left) and 1% annual VAR (right) of the portfolio are shown



Prepared by Conning, Inc.

Source: Conning Climate Risk Analyzer™



# Banks seek regulatory guidance on climate transition plans

Policy-makers struggle to agree on how to identify whether borrowers are converging with net-zero targets. By Sharon Thiruchelvam

Some of the world's largest banks say they need global standards to classify and measure the financing of transition to a low-carbon economy. While initiatives already exist for individual companies to disclose carbon emissions, there is no consensus on how to define lending that helps carbon emitters to transition to a greener business profile.

Tracey McDermott, group head of conduct and compliance at Standard Chartered and chair of the Net-Zero Banking Alliance (NZBA) said transition finance will be at the heart of achieving net-zero carbon targets.

"But there is a question as to what you define as transition finance, there is no taxonomy. [The NZBA] published our own framework last week... but that is without any sort of regulatory or other authority," McDermott said at a COP26 event held on November 4.

The NZBA has 92 member banks representing 43% of global banking assets (\$66 trillion), and includes the 10 largest banks by assets in both North America and Europe. These banks have committed to using their lending power to halt global warming at 1.5° Celsius above pre-industrial levels.

However, its members say policy-makers must kickstart the transition by agreeing a taxonomy for transition activities, intermediate decarbonisation targets, and economy-wide incentives to support the transition.

Ana Botin, executive chair of the Santander group, another NZBA signatory, said governments need to determine which activities are considered green and what is an appropriate "pathway to green".

"We're happy to do it as a private sector, but that's not our job. We need clarity on what language we speak... and how we measure," said Botin. "It is really important that government set the intermediate targets... [and they] need to be very conscious what are the taxes, incentives and disincentives."

The European Union has already established a green taxonomy defining assets that are not considered major contributors to climate change. However, transition taxonomies are meant to be more dynamic, providing criteria and methodologies that assess the pathway for companies operating in traditionally high-emission sectors to engage in climate change mitigation.

"Is gas included? What do you do in terms of breakthrough technologies? And how do you account for that?" explained McDermott. "Because...what really matters is the impact that's having in terms of reduction of emissions and emission intensity and that, I think, is the challenge that we need to tackle."

According to research by Natixis from July 2021, only Japan and Canada are close to developing transition taxonomies. The EU is working through feedback to a public consultation on extending its green taxonomy to include "transitional activities" and criteria through a traffic-light system.<sup>1</sup> A red rating means the activity will not have the potential to be compatible with a temperature rise of 2°C above pre-industrial levels, while yellow indicates the activity is transitioning towards that target.

## Residual carbon financing

While the United Nations Environment Programme, which sponsors the NZBA, has called for a halt to financing new fossil fuel projects, the NZBA members say existing fossil fuel financing must continue in the short term. The question is for how long.

Anne Finucane, vice-chair of Bank of America, told the panel: "We need help with these more difficult emitting industries, because if 80% of the world is still fuelled by fossil fuels, we can't just shut them off, nor can we shut down plants and skyscrapers and homes."

Botin called for companies, banks and regulators to agree viable standards on counterparty transition plans. "We need to be really, really careful of how we define the transition, what it is we need to do and to make it affordable and simple for customers," she said. "Some consumer groups believe we should stop financing gas altogether – that is not realistic."

NZBA banks also want official sector guidance and alignment on the treatment of developing economies. To this end, McDermott said the NZBA needs to increase its representation beyond the 39 countries currently represented.

"We've got to make sure that the transition is a just one – both in terms of helping the developing markets to continue to develop, but also in ensuring we don't set standards which mean money can only flow into EU or US companies, because they're the only ones that can meet the criteria," said McDermott.

## Regulators on the move

The Bank of England's (BoE's) executive director for financial stability strategy and risk, Sarah Breeden, told the panel that the BoE is already working with policy-makers and securities market regulators, including the UK Financial Conduct Authority, to ensure real-economy firms provide adequate emissions data and transition plans. The next step after disclosure may include aggregating, assessing and providing feedback on plans.

"What do all your transition plans add up to? Are we doing enough given we want to keep 1.5°C alive?" said Breeden.

She added that regulators were also looking to consolidate the climate scenario analysis that several jurisdictions have been pursuing separately. In addition to the BoE, the Banque de France has undertaken a climate risk stress test, and the European Central Bank is due to follow suit next year.

"It's healthy that we tried a variety of approaches, but we do need to get to a point where there is a best practice," said Breeden.

With regard to continued financing of fossil fuels, Breeden said this was reflected in the differences between the International Energy Agency (IEA) 1.5°C scenario and the scenarios created by the financial regulators' Network for Greening the Financial System (NGFS). She said the BoE's objective is "as orderly a transition with as low cost as possible".

"If you compare the NGFS scenarios with the IEA scenarios, there's more use of fossil fuels in ours than in the IEA's net-zero scenario, precisely for this reason."

Breeden said the NGFS scenarios are designed to ensure the rate at which fossil fuels are retired is consistent with the building of new renewable sources.

"What we're seeing in the energy market now is an imbalance of supply and demand, and prices are going up, and that's having a real impact on people," she said.

Recent months have seen sharp spikes in gas prices as the global economy recovers from Covid, resulting in severe problems among UK energy suppliers in particular. ■

*Previously published on Risk.net*

<sup>1</sup> Platform on Sustainable Finance (July 2021). Public consultation report on taxonomy extension options linked to environmental objectives, [www.bis.ly/31SmfSd](http://www.bis.ly/31SmfSd)

# Making the cut

## EU eyes Isda's carbon trading proposals

The European Banking Authority fears the suggested treatment of emissions would be misaligned with rest of the Basel Committee's Fundamental Review of the Trading Book. By Samuel Wilkes

**W**hat happens when a prudential framework, which took years of negotiation to design, meets plans for combatting climate change that have also taken years of diplomatic wrangling?

The trading of carbon emissions is seen as essential to establish carbon pricing as a market mechanism to cut total emissions. That, in turn, is vital to the objective of the hard-won 2015 Paris climate agreement to limit the rise in global temperatures to 1.5° Celsius above pre-industrial levels.

But a study earlier this year by the International Swaps and Derivatives Association (Isda) claims the standardised approaches (SAs) contained in soon-to-be-implemented trading book capital rules for banks are so penal they may inhibit the development of carbon trading.

### Need to know

- The International Swaps and Derivatives Association disputes parameters set by regulators in upcoming prudential rules for banks to calculate the level of capital they need to hold against emissions allowances.
- A study by the industry association recommends lowering the risk weight for volatility and increasing a correlation parameter for emissions allowances based on evidence from the European Union's market, to lighten the capital treatment for banks' trading allowances.
- But the recommendations would remove an element of conservatism baked into the capital for emissions allowances, as Isda's study excludes periods of volatility used to calibrate risk weights for most other assets.
- However, the move could serve the political objective of using emissions trading markets to help establish a rising carbon price to incentivise the shift towards a low-carbon economy.

**"One has to be honest – not all the capital framework is driven by data; a lot of it is driven by political concerns"**

Jochen Theis, independent consultant

The trouble is that the Basel Committee on Banking Supervision's Fundamental Review of the Trading Book (FRTB) was also the product of a lengthy process of talks that included multiple drafts. Trying to unpick one part of the market risk capital rules could create inconsistency across the framework, and undermine the level of conservatism regulators deliberately incorporated into the FRTB.

The European Banking Authority (EBA) has reservations, but is not ruling out changes. "We recognise that elements like carbon trading will probably be important in order to facilitate a transition to a more carbon-neutral economy," says Lars Overby, head of risk-based metrics at the EBA. "It should however be recalled that the SA is supposed to be relatively simple. That being said, if carbon trading becomes more important in bank balance sheets, especially in the EU, we will need to look into this in more detail, if it turns out to be overly punitive."

The FRTB requires banks to calculate the level of risk-weighted assets (RWAs) within their trading books by either using their own internal models – if they pass a series of rigorous tests – or with the regulator-set SA. Banks must then hold a minimum percentage of capital against a proportion of the RWAs. The SA is set to become even more important as jurisdictions implement Basel's output floor, which prevents capital requirements based on internal models falling below 72.5% of the results using the standardised methods.

Isda released a report in July recommending changes to the SA, which it says does not reflect the actual risk banks face when acting as intermediaries within emissions trading scheme (ETS) markets.

"Clearly the higher the RWA, the fewer incentives there will be to keep [emissions allowances] in the bank's balance sheet," says a senior risk modeller at

a European investment bank.

However, there is little evidence that the RWAs generated under the SA for carbon emissions are somehow too high compared with other market risk assets.

Moreover, Isda's proposal does not use the same historical stress period that most of the rest of the capital framework is based on – the 2008 financial crash. That means it would create inconsistencies within the FRTB, where emissions allowances base their risk weights on a different observation window from other forms of market risk.

A green exception to help achieve net-zero emissions by 2050 isn't necessarily a bad idea if it meets the objective of combatting climate change, and it might be better timing to adjust the FRTB before it enters into force.

That touches on a wider question regarding the SA. Internal model outputs will adjust as the market performance data evolves. By contrast, the data underpinning the SA can become stale at some point, and the calibration may no longer be appropriate.

Three sources tell *Risk.net* they have heard the European Commission (EC) is considering making a targeted alteration on their version of the FRTB when they implement it. A first draft is likely to be published this month. But that would raise a further concern. The carbon market is global, so there would be an unlevel playing field if the EU dilutes FRTB but other jurisdictions do not.

"There are some concerns in affecting the level playing field if we change at EU level only," says Stephane Boivin, a senior policy expert in the EBA's risk-based metrics unit. "However, it also depends on the importance of this topic in other jurisdictions – this is clearly a key topic for the EU."

The EC did not respond to *Risk.net's* request for comment.



## “Clearly the higher the RWA, the fewer incentives there will be to keep [emissions allowances] in the bank’s balance sheet”

Senior risk modeller at a European investment bank

### A different treatment

Companies must have enough emissions allowances to match the quantity of carbon emissions they produce. The idea is for governments to set and cap the emissions their economies produce. By capping and lowering the amount of allowances, governments can encourage industries to reduce emissions by making it cheaper to cut emissions than to buy allowances to cover them.

Allowances are allocated for free or are auctioned. Banks typically sell forward contracts to deliver emissions allowances to a company and hedge the trade by buying certificates from the auctions.

The Isda study – based on data from the EU emissions allowance market – pointed to two inputs in the SA as being disproportionate to the level of risk banks undertake in ETS markets: the risk-weight bucket representing price volatility and a correlation parameter used for aggregating trades with different tenors.

Emissions allowances share a risk-weight bucket with electricity, which slaps a 60% risk weight on open positions. Isda estimates emissions volatility should be closer to a 40% bucket given to metals.

“Any calibration of any model is only as good as the historical data that feed into it – if the market is evolving and changing, then there has to be a process where this new information is taken under consideration,” says Panayiotis Dionysopoulos, head of capital at Isda. “How does that reconcile with the fact that any changes in those SAs have to go through this lengthy legislative process?”

The EU emissions stabilisation mechanism was introduced in 2017, and allows authorities to withdraw allowances in the market during times of excess supply. This measure has helped stabilise prices in the market.

“The issue is also that the stress period used for calibrating FRTB risk weights precedes the application of the EU stabilisation mechanism on carbon trading,” says the EBA’s Boivin.

In addition, the netting ability for carbon emissions is based on the risk buckets for commodities. That means a correlation of 0.99 is assumed if the commodities are in the same risk bucket, but one of the commodity type, tenor or delivery location is different. Isda states the correlation is closer to 0.996 for emissions allowances. Although a seemingly small change, it can have big consequences for capital.

### Forgetting 2008

The internal models approach (IMA) is intended to give banks the flexibility to track changes in a product’s risk profile over time. Conversely, the SA is meant to be a simpler fallback that is not perfectly risk-sensitive.

“The standardised approach looks at some minimal set of indicators and says: ‘This is enough capital for this product,’” says Robert Litterman, a founding partner at New York-based hedge fund Kepos Capital and chairman of the Commodity Futures Trading Commission’s climate-related market risk subcommittee. “That is why it is more conservative, because it doesn’t drill down into these correlations and how they are changing over time – and they do change over time.”

That means the conservatism in the SA for emissions allowances isn’t necessarily out of line with other market risks.

Isda does give one comparative example in its study – the volatility of crude oil futures. Although the risk weight for crude oil is around half of that for carbon certificates, volatility between the two products since 2015 has been relatively close – indeed, crude oil has become more volatile than emissions in 2020 and 2021.

The problem with the Isda recommendation, though, is that it requires emissions allowances to receive a different treatment from other products. In the period between 2012 and 2015, emissions allowances were much more volatile than oil, peaking at almost 80% yearly average volatility in 2014. Crude oil hasn’t reached such heights of volatility at any time between 2009 and 2021, according to Isda’s paper.

So the lower volatility bucket and higher correlation assumption for emissions proposed in Isda’s paper are based on excluding the period before mid-2013. But when designing the post-crisis market risk capital rules in 2016, the Basel Committee had considered earlier peak stress periods.

For most products, that would be the 2008 financial crash. This means that if Isda’s proposal were implemented, the SA for emissions would be based on a reference period for volatility and correlation that is inconsistent with other products.

“So it means that there would be a mismatch, for example in the correlation between risk factors, if we were to consider a more recent stress period for this particular bucket – that is one of the difficulties in reconsidering the framework right now,” says Boivin.

### IMA versus SA

A similar inconsistency would emerge between banks using the IMA and those using the SA for carbon emissions. Banks with IMA approval must use an expected shortfall measure to calculate their RWAs.

Expected shortfall is calculated by averaging all of the returns in the distribution that are worse than the portfolio’s value-at-risk – a long-established measure for estimating financial risk – at a given level of confidence. It must include the worst year for a bank’s portfolio since 2007. For most banks, once again, this is the 2008 financial crisis.

“If we change the [emissions] risk-weight [to reference] more recent volatility under the standardised approach, we would risk creating a discrepancy between IMA and standardised approach banks,” says Boivin. “Many IMA banks, despite Covid-19, are still using a one-year period around 2008 as their stress period, so they would be capturing higher volatility than standardised approach banks.”

Fundamentally, the problem with narrowing the historical observation to exclude the period with the most severe stress is that, if a similar worst-case shock appears in the future, the capital requirements are suddenly too lenient.

“Those correlations [in the Isda study] were super high, but how do I know they aren’t going to come down? When you get a shock in the market, who knows what will happen to volatilities and correlations?” asks Litterman. “The whole idea of the standardised approach is that it is not so finely tuned that a change in the market will cause [capital requirements] to be too low.”

### Now or never

One argument in favour of moving now is that both the EU and the US are preparing for substantial regulatory packages to implement the final pieces of Basel III. In the US, the Federal Reserve will need several rounds of consultation on the FRTB.

In the EU, the process will be even more difficult, as the final FRTB capital requirements are likely to be contained in a huge package known as the third capital requirements regulation (CRR III) that will need to be agreed between the EC, Council of the EU and European Parliament.

“I don’t think they are going to revise that capital framework again any time soon after CRR III, so it is probably a good chance to get that [change for carbon emissions] in,” says Jochen Theis, an independent consultant and former head of market risk modelling at a number of global banks.



He adds that there is plenty of precedent for tweaking risk weights to suit a policy objective, rather than to produce an exact risk-based calibration.

“One has to be honest – not all the capital framework is driven by data; a lot of it is driven by political concerns, like the treatment of mortgages and other assets,” says Theis. “There are certainly bits and pieces of the standardised framework that give a slightly better treatment to certain kinds of risk than to others.”

If a change to the treatment of carbon emissions is not included in CRR III, the EU might still have another opportunity shortly thereafter. By June 23, the EBA is due to deliver advice to the EC on a dedicated prudential treatment designed to incentivise exposures that support environmental and social objectives. Following that review, the EC has the power to propose changes to the capital rules depending on the outcome of the EBA’s report.

While the EU moving alone would raise level playing field issues, it is unclear whether the US should follow suit from a purely risk-based perspective. One of the difficulties with Isda’s proposal is that the Basel 60% risk weight was designed to apply globally, and so its calibration was based on carbon markets beyond just the EU.

“In general, several jurisdictions were considered, but at the same time, data was compounded to make it relevant at global level,” says Marco Crotti, a policy expert in the risk-based metrics unit at the EBA.

By contrast, Isda’s study was primarily based on the behaviour of the EU emissions trading scheme. Other jurisdictions do not share the same price stability mechanisms as the EU’s market, and nor are most other carbon markets as liquid in comparison. As a result, Isda’s proposed recalibration could be unsuitable for other jurisdictions.

That may well begin to change, especially given the focus of President Joe Biden’s US administration on tackling climate risk. But for now, nobody knows what policy initiatives the US will take, or indeed whether there will be further steps in the EU. And that’s exactly the reason why the SA for carbon emissions needs to remain conservative, according to Litterman.

“In terms of volatility and in terms of any changes in volatility, government policy could change – you never know,” he says. “That is a big part of the uncertainty in the allowance market: it is government policy that creates the market, so it is government policy that dominates uncertainty.” ■

*Previously published on Risk.net*





# Sending the right signals

## Quantifying and repricing risk

*Risk.net* convened a panel of three experts from different fields to discuss some of the most pressing and pertinent climate-risk related issues, each offering different insight to the discussion from their respective backgrounds, providing an exchange of ideas on the importance of the financial risks and opportunities of climate change

Averting catastrophic climate change is a big ask for a nascent discipline, yet effective climate risk management could do exactly that. Only by quantifying and repricing risk will the correct price signals be sent out across the economy to channel investments away from polluting activities and into the required clean energy and green technologies.

The myriad ways in which decarbonisation could be achieved, and the countless unknowns that will pop up along the journey, make climate risk management exceedingly challenging. This is why discussion and exchange of ideas on the financial risks and opportunities of climate change is so important. In this Q&A, three experts answer some of the major questions being asked about the discipline today, each bringing a different angle to the debate.

**What can be done to improve the level of climate risk disclosure from capital markets participants and mid-sized to large corporations? How important is it that firms follow the guidelines of the Task Force on Climate-related Financial Disclosures (TCFD)?**

**Matthew Lightwood, Conning:** It is essential that governments adopt a consistent global reporting standard for climate disclosures and write these into law. They need to be sufficiently detailed so investors can unambiguously differentiate firms from one another. Also, I see a lot of claims around net-zero ambitions and a need for more rigorous testing of the assumptions around the magnitude of the netting effect of some initiatives. There is a great degree of scepticism among the general public on this issue, and we won't get a second chance to get it right.

**Nick Stansbury, Legal & General Investment Management (LGIM):**

There are two main routes to improving disclosure: investor pressure and regulatory change.

Disclosure should be a key element of investor engagement with investee companies. Without carbon data, it is difficult for investors to understand their investments' climate risk exposure and evaluate their climate impact. The TCFD provides best-practice guidance on climate reporting for different sectors, and can be used as a checklist when evaluating investee companies' disclosure. Investors can set their own minimum standards based on this checklist – a 'must-have' list – and impose voting or divestment sanctions where these are not met.

Policy-makers must enshrine their own minimum standards into relevant regulation. This is already happening, with significant regulatory momentum observed across the world. In many jurisdictions, such as the UK, mandatory disclosures will be directly based on the TCFD guidelines. Companies must follow these guidelines as soon as possible if they are to avoid a costly crunch when recommendations become requirements.



Matthew Lightwood  
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**What role will voluntary carbon markets play in the energy transition over the next few years, and how will they develop?**

**Matthew Lightwood:** While I think voluntary carbon markets are admirable, there is a risk of them being used by the worst emitters to do less than they could on reduction. The scale of emissions is so much greater than our ability to scale carbon-reduction technologies that I worry we are overestimating the impact these schemes can have on the problem at hand. I think a compulsory cap-and-trade system would have a larger impact. This was highly effective at combatting acid rain in the 1980s and could contribute here too.

**Robert Litterman, Commodity Futures Trading Commission:** Many climate scientists and conservation experts believe protecting existing forests and regenerating degraded forest lands are the least expensive approaches to increasing the earth's ability to pull carbon dioxide out of the atmosphere. These critically important activities have not scaled up in recent decades, however, because they require investments that have, to date, been voluntary, with no promise of return. Few investors participate in the voluntary market because, while it may make them feel better, it provides no opportunity for financial returns.

For the forest carbon credit markets to scale, they must provide positive expected returns to investors. This can be achieved by using remote sensing technology to create real, measurable, auditable and high-quality carbon fluxes to which carbon credits can attach ownership rights. By measuring carbon content and flux of landscapes, as well as political jurisdictions, such technology can address the key issues of permanence, additionality and leakage.

Just as financial markets create large, liquid markets for mortgages – which are packages of risky cashflows backed by idiosyncratic properties – those markets can create liquidity and scale for forest carbon credits. To do so, however, these credits cannot be voluntary, but must be investable securities representing insured claims on future carbon fluxes that are expected to have compliance value, and thus generate positive expected returns for investors.





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### Do you expect an industry-standard climate risk stress test to emerge?

**Nick Stansbury:** There have been calls for more standardisation in climate risk analysis. It is important to distinguish between three important dimensions along which this could take place: scenarios, methodologies and outputs.

The first element that could be standardised are the scenarios companies consider. This is, in effect, the 'input' of the stress test. For example, the Network for Greening the Financial System (NGFS) provides a standard set of scenario narratives, which it says provides a point of reference for climate risk analysis. These may come close to representing an industry standard. Standardising scenarios could ensure some degree of comparability across analyses from different companies. It could ensure companies don't only stress-test against scenarios designed to be less disruptive for their business model. However, given the degree of uncertainty around future climate outcomes and the pathways of getting there, complete standardisation would do more harm than good.

The second element would be the methodology with which companies analyse their exposure. The same scenario could represent different levels of risk depending on the method of quantification. Given the complexity of these analyses, numerous assumptions are needed to arrive at a climate risk number. As companies often disclose only a limited number of these assumptions, comparisons across different climate risk numbers can be challenging for third parties. Especially if the third element – outputs – also differs across analyses.

The best outcome could be a mixture of standardisation and freedom: ensuring companies stress test against a set of standard scenarios, given a specific methodology, and producing a specific set of outputs and allowing them to explore their own specifications in addition to this.

**Matthew Lightwood:** Yes and no. I think some standardisation is likely because most of what we have seen so far has been based on the NGFS framework in some way. However, what we are seeing more and more is a move away from highly prescriptive stress tests and towards a more interpretative approach. For example, the Bank of England's (BoE's) Climate Biennial Exploratory Scenario (CBES) defines a very wide range of financial, economic, transitional and physical climate risk scenarios, and it is very much up to the insurer or bank to make use of those and think about what it means to their business. This is very deliberate; regulators want risk departments and boards to put some effort in to understanding their particular exposures to the risk.

### How should firms incorporate climate risk within their strategic and risk management frameworks?

**Matthew Lightwood:** This is the third pillar of climate risk reporting from a regulatory perspective. First, insurers have to size the risk, understand the impact on their firm's business model and, finally, management needs to decide how to use this information to inform future strategic decisions. This third step is extremely challenging in practice because, until there is firm action from governments on the cost of carbon, it is difficult to see what management actions might be appropriate today that would also align with their basic fiduciary duties. There are perhaps some exceptions to this on the liability side and also when we start to consider reputational risk, but I don't see markets realigning themselves without some policy action as a trigger.

### What have been the most important developments in the field of financial climate risk modelling in recent years? What are the key challenges to modelling climate risk exposure in a portfolio?

**Nick Stansbury:** Climate risk modelling is a relatively new discipline, but it has evolved considerably since 2017 when the TCFD first recommended climate scenario analysis for risk management purposes.

First, the diversity of climate scenarios has grown significantly. There are now many more organisations and companies providing possible pathways to a given climate outcome, not least the NGFS. There are also more destinations being considered – especially around the 1.5° Celsius outcome, which rose to prominence following a special report from the Intergovernmental Panel on Climate Change (IPCC) in 2018.

Second, climate science has evolved. Climate change and associated risks can be modelled with greater certainty than before. New carbon budgets indicating the amount of carbon humanity can emit before reaching a certain temperature outcome by the end of the century have been provided by the IPCC, most recently in August 2021.

Third, companies have developed their modelling capacities. Taking climate scenarios and translating them into financial impacts – or indeed quantifying the impacts of companies on the climate – were not common practice prior to 2017 outside of the energy sector. Now, many companies – especially investors – have internal modelling capabilities specialising in their individual interests.

The key challenge for investors when modelling portfolio risk exposure is to capture the individual investment context while enabling big-picture conclusions. The transition will not affect all companies in a sector in the same way: a company's financial situation, carbon performance, asset locations and many more factors play important roles in determining risk. Yet the amount of data required to evaluate company-specific risk is very large, and can be patchy, especially around issues like Scope 3 emissions and physical assets. Collecting all available data on an entity and filling any gaps is time-intensive, but as much of a portfolio as possible must be captured to arrive at a meaningful high-level conclusion. Therefore, the key challenge is the balancing act of capturing investment-level detail and providing meaningful high-level results.



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**Robert Litterman:** It is important to separate the growing specific climate risks that threaten individuals, companies, cities and regions from the longer-term aggregate systemic risk that faces humanity globally. The former are mostly local, measurable impacts of extreme weather events or sea-level rise, and can be adapted to, mitigated and insured against, whereas the latter are difficult to quantify and can be addressed only through urgent aggregate collective action to reduce global emissions.

The explosion in the availability of public data, analytic approaches and experience in addressing specific extreme weather impacts means corporations are much better able to address, measure and disclose specific climate risks. Public and private climate risk analysis and understanding has increased greatly in recent years.

While these specific impacts will grow, they will differ by location and business sector, and aggregate portfolio climate risk exposure will likely emerge more slowly over time as individual specific impacts increase in size and frequency. Aggregate risk will increase to the extent that specific climate impacts deplete aggregate financial resources. Though less understood – and perhaps less likely – the most dangerous long-term climate risks may well be caused by non-linear responses to impacts that emerge suddenly and had not even been recognised ahead of time.

**Matthew Lightwood:** The availability of data and the development of some freely available detailed scenario sets have made the task of defining climate stress tests much simpler. Then there has been the development of software solutions that help make those scenarios implementable and to turn them into analytics. This has been key – seeing systems becoming available to make the process practicable.

One of the main challenges is centred around the fact there is no really robust way of pinning economic and financial market effects on a particular climate scenario. Trying to understand the distribution of possible outcomes is key. A transition to a low-carbon economy, for instance, may have the potential for upside as well as downside – spurring innovation and fiscal stimulus, perhaps. A deterministic stress test doesn't really tell you anything about that, so we've been developing techniques that model the range of outcomes using the stochastic modelling techniques in which we already have expertise. This really helps to capture the uncertainty in the future market impacts of climate risk and avoid the pitfalls of false precision.

### How are developments in technology and analytics helping with climate risk management?

**Robert Litterman:** Climate risk is an emerging scientific field with an explosion of data gathered through remote sensing and satellite imagery, large-scale modelling and forecasting abilities. As a simple example, the science of rapid attribution of extreme weather events to climate change, based on climate simulations with and without changes in atmospheric greenhouse gases, has emerged in the past decade, allowing the public to make the connection between local impacts and climate change. This increased public understanding supports appropriate government policy as well as private adaptation and mitigation strategies. Another example is the ability to project sea-level rise at very fine granularity, which allows homeowners and businesses to gauge the adequacy of their mitigation efforts.

**Matthew Lightwood:** We have seen a big spike in companies looking for technological solutions to help them make sense of the emerging regulatory requirements around climate risk. Within insurance this has centred around the Own Risk and Solvency Assessment and the type of scenario analysis requirements the BoE and the UK's Prudential Regulatory Authority released as part of its CBES exercise earlier this year. We have been working with a number of clients to develop a cloud-based stochastic scenario analysis tool, which enables them to assess the impact of climate scenarios on the asset side of the balance sheet in a more quantitative way. Having a pre-packaged and implementable solution to these standardised stress tests is proving very popular, particularly for mid-sized insurers that maybe don't have the resources to have a dedicated climate or environment, social and governance (ESG) risk person.

### What are the most important metrics for measuring climate risk? Can it be quantified in a similar way to market risk or do factors such as sentiment and reputation make it a 'soft' rather than 'hard' discipline?

**Matthew Lightwood:** I think it is both. We are seeing the types of quantitative analysis we are doing with clients is being used to feed into those softer qualitative discussions. Climate is definitely a branch of market risk, whereas ESG is more a governance issue with climate as a related topic.

**Nick Stansbury:** LGIM believes it important to consider climate risk from two angles: first, the risk that climate change and any policy response represent to companies; and second, the risk that companies represent to climate change. We see asset valuation risk as capturing the first dynamic, and temperature alignment as capturing the second.

Climate risk can and should be quantified in a similar way to market risk. That is the only way the results of climate risk stress-testing will be taken seriously by market participants. Of course, there are weaknesses in this approach: not all elements of climate risk can be meaningfully quantified, and even those we can quantify carry an unusually high level of uncertainty.

Areas with potential climate-related risks that are difficult to quantify in a meaningful way are reputation and litigation risk. As the impacts of climate change worsen, firms that do not align with a low-carbon transition could lose their social licence to operate and see consumers shift demand elsewhere. For high emitters, there is an additional question: will they one day be held to account for the climate risk they contributed to through historical emissions? The science around attribution of individual climate-related events such as hurricanes and flooding to specific emitters provides insufficient grounds for such lawsuits – but this could change in the future, with significant financial consequences.

Even elements that can be quantified are likely to carry a much higher amount of uncertainty than typical market risk metrics. There are many reasons for this, including the unprecedented nature of the risks and the unusually lengthy time horizons considered. Yet they provide invaluable insights into the significance of climate risk and must be quantified, despite shortcomings. Over time we can work on adding capacity to quantify the 'softer' parts of climate risk previously mentioned, as the science and sentiment around climate change are constantly evolving. ■

>> The panellists' responses to our questionnaire are made in a personal capacity, and the views expressed herein do not necessarily reflect or represent the views of their employing institutions



# TCFD backs carbon disclosure, but not temperature scores

The influential standard-setter, the Task Force on Climate-related Financial Disclosures, declares the implied temperature rise 'not ready' for funds. By Will Hadfield and Nell Mackenzie

The most widely used standard-setter for climate disclosures has omitted temperature scores, which reveal how much global warming a company is on track to cause, from a list of metrics that it is recommending.

The Task Force on Climate-related Financial Disclosures (TCFD), which was set up by the Financial Stability Board, urged companies to publish climate metrics in seven areas as it unveiled its annual review of compliance with its recommendations.<sup>1</sup>

The TCFD, which is chaired by Michael Bloomberg, asked all organisations to disclose their greenhouse gas emissions for the first time, regardless of their size. It also called for businesses to reveal their indirect emissions, including for asset managers to disclose the carbon emitted by their investment portfolios. However, the TCFD stopped short of pushing finance firms to publish the implied temperature rise of the stocks and bonds in their portfolios.

"Implied temperature rise, although important, just is not ready today," said Mara Childress of the TCFD's secretariat. "We did a consultation on forward-looking metrics for the financial sector. And we received over 200 responses to that. We've heard, essentially, that these forward-looking metrics for the financial sector are important. But they're still new. So there are still some data challenges. There is still variation in methodologies. And there are still things that financial institutions are working on internally."

The TCFD recommended that firms calculate their emissions intensity – the carbon they emit for every \$1 million of revenue or every \$1 million invested. Asset managers need to know both the greenhouse gas emissions of the firms they invest in and the emissions intensity of those firms before they can calculate an implied temperature rise for their portfolios.

Asset managers can mark their progress in cutting the carbon emitted by their portfolio by monitoring emissions intensity. If emissions intensity declines, the asset manager's contribution to global warming is falling even if its assets under management, and therefore its absolute greenhouse gas emissions, significantly increase. Emissions intensity, however it is calculated, is based on a company's current behaviour, not how much it will pollute in future.

**"Implementing forward-looking approaches such as implied temperature rise metrics is fundamental to our ability to successfully navigate the climate transition"**

Hubert Keller, Lombard Odier

No measure of emissions intensity is forward looking, says Todd Bridges, global head of sustainable investing at Arabesque, which runs an implied temperature rise methodology. "You can do all you want to decarbonise, but the minute you want projections, you need an implied temperature rise tool," he says.

Asset managers that calculate the temperature rating of individual securities can either sell them or pressure management to change their business practices.

"Understanding which companies within high-emitting sectors are emerging as climate leaders, rather than climate laggards, is a critical part of the transition," says Hubert Keller, senior managing partner at Lombard Odier, which also supplies an implied temperature rise score. "Implementing forward-looking approaches such as implied temperature rise metrics is fundamental to our ability to successfully navigate the climate transition."

The TCFD commissioned a report on forward-looking climate metrics, including implied temperature rise scores, which was also published on October 14.<sup>2</sup> The report by the Portfolio Alignment Team – a group set up by Mark Carney – recommended three ways to improve tools that show whether a portfolio is on track to deliver the Paris Agreement's target of "well below 2° Celsius" of global warming.

The report said that more companies need to disclose their emissions, there needs to be more research into climate scenarios, and the firms that operate methodologies need to disclose more information about how they calculate their ratings.

The TCFD review of compliance with its standards revealed that few institutional investors have calculated their contribution to global warming.

Just 3.3% of institutional investors disclosed an implied temperature rise score. Just 3% of asset owners and 1.5% of asset managers have aligned their group-wide portfolios with a goal to reduce carbon emissions to net zero.

These results came from the UN-affiliated member group, Principles for Responsible Investment (PRI), because the range of public reporting methods for the investment industry meant it was largely excluded from the main results of the TCFD report. Asset managers and owners pay to belong to PRI.

This was the first year that the 2,720 asset managers and owners which are signatories to the PRI, including pension funds and insurance companies from 60 different countries, published a portion of their results publicly.

Three-quarters of these investors said there was a strategy for the risks and opportunities that climate change presented their firm and more than half spoke about how global warming would impact their organisation.

While a fifth of investors used some kind of climate-related metrics, 8% of asset managers and 12% of asset owners shared information on how many greenhouse gas emissions they were responsible for as a company (Scopes 1 and 2) and their investments and supply chain (Scope 3). Even fewer set targets for reducing these – 7% of asset managers and 10% of asset owners.

The number of PRI signatory investors represent a tenth of the industry in the US, according to numbers by data provider Preqin included in the TCFD report. ■

*Previously published on Risk.net*

<sup>1</sup> TCFD (October 2021). Fourth TCFD status report highlights greatest progress to date on TCFD adoption, [www.bit.ly/2ZcmTee](http://www.bit.ly/2ZcmTee)

<sup>2</sup> Portfolio Alignment Team (September 2021). Measuring portfolio alignment: technical considerations, [www.bit.ly/2Xu1b2u](http://www.bit.ly/2Xu1b2u)

# Study fuels doubt over benefits of climate risk weights

Research by a Paris-based think-tank finds that both a green supporting factor and a carbon penalising factor have drawbacks.  
By Samuel Wilkes

Cutting bank capital requirements for green assets may not provide enough financial incentive to change consumer behaviour, a Paris-based think-tank has found, in a study published in September.

"The impact is quite weak, especially for renovations and electric cars," says Julie Evain, a research fellow at the Institute for Climate Economics (I4CE) and one of the study's authors.

The study also warns that setting risk weights to penalise dirty assets could hamper the transition to net-zero carbon emissions.

Given that prices for electric cars are coming down, Evain says the financial benefit of a green supporting factor (GSF) for a purchaser would be worth no more than simply waiting two months to buy the car. This is the case even assuming a high GSF that halves current risk weights on bank loans for electric cars.

"So we see it is a very small part of the equation, and it is really not strong enough to push people to buy an electric car," says Evain.

The European Union is considering providing preferential capital treatment to assets that comply with EU environmental and social policy objectives, including the Paris Agreement targets for carbon emission reductions.

As part of its strategy for switching to a sustainable economy, unveiled in July 2021, the European Commission says it will bring forward

the deadline by which the European Banking Authority (EBA) must deliver an assessment of whether to provide preferential capital treatment for activities that have environmental and social objectives. This report must now be delivered in June 2023, two years earlier than previously planned.

The I4CE's study pours cold water on the rationale for adjusting risk weights to encourage the economy to transition to net zero.

## Much smaller than subsidies

The think-tank built a model that simulates the change in loan rates offered to customers depending on the setting of a GSF. The model determines the rate level banks must set to generate a return on the regulatory capital required after the deduction of other costs, such as taxes, costs of borrowing and salaries. These assumptions are derived from the six largest French banking groups' annual reports.

The model ensures banks' return on capital from loans is set at 6.3% – a value the French Prudential Supervision and Resolution Authority (ACPR) states in a report released in 2020 as the return on capital for the French banking sector.

Results from the model have also been cross-referenced with several studies that look into the elasticity between capital requirements and loan prices, which corroborate the model's findings.

The I4CE study explored GSFs that grant 15%, 25% and 50% discounts in risk weights, and assumed banks passed the whole discount on to customers – meaning the maximum possible deduction in loan rates was assumed. Current supporting factors for loans to small and medium-sized enterprises and to infrastructure projects contained in existing EU capital rules are set at 25%.

The model found annual loan rates saw reductions of 10% for a GSF set at 50% and 5% for one set at 25%. For shorter-dated loans of one to two years, that would mean the cost of the total purchase decreases by just 0.2% to 0.5%.

For example, a car loan totalling €30,000 would only receive a €200 discount. "Almost nothing," says Evain, especially when compared with state subsidies, which in France can range between €5,000 and €7,000 for electric vehicles.

## FOCUS ON EXISTING SUPPORTING FACTORS

For longer-dated loans – of at least 10 years – the reduction in total funding costs from a GSF is higher than for short-term loans such as car financing. This is because the lower interest paid at the beginning of the loan allows faster repayment of principal, pushing down subsequent interest costs. According to the study, this can reduce the total borrowing costs of projects with longer-dated loans by 1% to 3%.

A high GSF could therefore have a "considerable impact" on the cost of renewable energy projects, Evain says. However, the study warns against granting

the factor for renewables projects, because they do not currently struggle with access to financing unless they have not received planning permission – in which case they would present a regulatory risk to the bank.

In fact, there is already an oversupply of credit to the renewables sector. Instead, the I4CE advocates adjusting the EU's existing 25% infrastructure supporting factor so that it is only available for exposures to renewable energy projects, rather than to all.





### More ambition

The study also looked at whether the presence of a GSF would encourage banks to alter their lending strategies to funnel more credit to green projects, even if it does not have a substantial impact on customer borrowing costs. However, Evain is unconvinced it would push banks to adopt more ambitious investment strategies for financing the transition, because the capital freed up can only be allocated to the share of available green projects, which estimates put at 1% to 5% of total loans. The study only applied the GSF to new loans banks would make.

Under the assumption banks increase their stock of green investments according to France's road map to fight climate change – aiming at a 20% increase year on year – it would take until 2028 for the stock of green loans to become materially different under a GSF than it would under current lending strategies.

"We thought it would have an interesting effect, because it would push banks to have a more ambitious green strategy," says Evain. "But we found that because the green pocket of loans is not super wide at the moment and you can't renew all your loans at the same point, you really have to wait five to eight years to see a strong difference between banks that are business-as-usual and banks that really adopt ambitious strategies."

The capital discount from a GSF may not be used to pursue an aggressive increase in green loans, warns the study, but could be distributed to shareholders – between €1 billion and €2 billion from 2022 to 2028.

**"Sometimes, by integrating the risk [into capital requirements], you can create more risk because you have a negative impact on the transition"**

Julie Evain, I4CE

### Law of unintended consequences

This study confirms the view of those who have criticised the idea of a GSF, including Pierre Monnin, a senior fellow of the Council on Economic Policies. He fears the GSF would serve only to decrease the overall capitalisation of the banking system at a time when climate change poses a potentially severe but not yet capitalised risk. Instead, he'd like to see a penalising factor (PF) that increases bank capital requirements for carbon-intensive assets.

"I think from a financial supervisor's perspective, it makes more sense to have a penalising factor because that increases the resilience of the banking system," says Monnin.

But the I4CE study sounds a note of caution on the PF as well. The research used three hypotheses to study the effects of a PF set at three different levels – 10%, 25% and 250% increases in capital – and looked at different ranges of assets caught within its grasp.

A PF set so it results in small increases in capital faces the same problem as the GSF: it will have little impact on the rates charged on loans to carbon emitters.

"To have a real impact on the transition, you have to go for a strong penalising factor, otherwise the impact a PF has on rates is not strong enough to really create a distortion," says Evain.

One regulatory expert at a European bank says if legislators do want to use capital requirements to encourage a transition, then a 1,250% risk weight on dirty assets would be the most effective at shifting those assets off banks' balance sheets.

Evain of the I4CE, however, says a heavy PF should only capture a small proportion of dirty assets. The reason is that if the perimeter is set too wide, then the depletion in capital ratios resulting from existing loan books would significantly reduce banks' ability to extend credit for economic transition or new green borrowers.

"You would have to be very cautious with the penalising factor," says Evain. "It can have a contraction effect – not only on the credit you are targeting but also on the rest of the economy, because if the perimeter is wide, then the bank has to hold much more in reserve and it can only give out much less credit."

A PF that captures a larger number of loans would also increase the amount of time banks will need to exit the penalised positions, causing a longer delay until they can start increasing lending to the green economy.

Evain says their study suggests regulators will need to view the problem not just as a matter of capitalising climate risk.

"Sometimes, by integrating the risk [into capital requirements], you can create more risk because you have a negative impact on the transition. We think it would be more interesting to look at supervisory mechanisms to link transition plans with stress tests," says Evain.

That would potentially involve moving to a dynamic balance sheet approach to stress-testing, as the ACPR did in its inaugural climate stress test this year. Ambitious transition plans at individual banks would therefore improve stress-test results. At present, the EBA uses a static balance sheet approach that simply stresses a bank's existing exposures, so it would be hard to demonstrate the benefits of a bank's transition plan. ■

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# Stock-level ‘inelasticity’ explains ESG boom

Environmental, social and governance investors’ reluctance to sell holdings is pushing prices even higher. By Rob Mannix

**T**he prices of ESG stocks are being driven up largely because many of the investors that hold them simply refuse to sell, new research finds.

Stocks that meet environmental, social and governance (ESG) criteria have beaten the wider market by around 1.5% per annum over the past five years. But in the absence of surging demand, these stocks would have underperformed the market by 2.1% a year, according to Philippe van der Beck, a researcher at École Polytechnique Fédérale de Lausanne and the Swiss Finance Institute, who carried out the study.<sup>1</sup>

While ESG investments still represent only a small portion of overall fund assets, they have grown exponentially in popularity. The first quarter of 2021 saw over \$180 billion in inflows to sustainable funds globally, according to data from Morningstar. But even with valuations rising rapidly in response to increasing demand, existing holders of ESG stocks are unwilling to sell their positions.

This unresponsiveness to price changes – known as inelasticity in academic parlance – means “flows are artificially pushing up realised returns”, says Van der Beck. He estimates that every dollar invested in ESG stocks over the past five years pushed up prices by \$2–2.50 on average.

Van der Beck’s findings also suggest that some specialist ESG funds – because of the inelasticity of the stocks they invest in – have a greater impact on the cost of capital for green firms than other such funds.

Using data from quarterly US mutual fund filings, Van der Beck examined how investors adjusted their portfolios in response to buying pressure in ESG stocks. He estimated a “price elasticity matrix” for every investor to gauge how quickly they would sell different stocks when prices rose. He then calculated a ‘multiplier’ for individual stocks – a measure of how far demand can move the price – based on the ownership-weighted sum of elasticities.

By simulating different levels of flows into ESG funds and then applying the multiplier, Van der Beck was able to estimate the returns attributable to the growth in investor demand. “These are returns not because of any fundamentals, but due just to flow-driven price pressure,” he explains. After deducting

**“The realised return on green firms will be even stronger in future if flows continue to rise, and that may be for years to come”**

Philippe van der Beck,  
École Polytechnique Fédérale de Lausanne

the flow-driven returns, he found the performance of ESG stocks to be “strongly negative”.

The latest research builds on recent high-profile work by Xavier Gabaix at Harvard and Ralph Koijen at Chicago Booth on how flows affect prices.

Economists and quants have long argued over whether flows influence prices, or vice versa. Conventional theory says flows have little price impact because investors will quickly sell out of stocks in response to growing demand.

By examining fund holdings data, Gabaix and Koijen showed that many investors are in fact price insensitive. This inelasticity in supply means demand spikes can cause outsized and permanent changes to stock prices.

“Classical financial market theory tells you investors are very elastic,” Van der Beck says. “The multiplier matrix would have all zeros. But everybody in the industry knows that large flows create price pressure. And that’s what we’re estimating.”

The research suggests ESG stocks will outperform as long as flows into the sector remain elevated. “The realised return on green firms will be even stronger in future if flows continue to rise, and that may be for years to come,” Van der Beck says.

## Spillovers

Van der Beck also tracked the spillover effects that occur when ESG sellers reallocate capital to other investments. “If you buy Apple, not only will you have an impact on the price of Apple but you will also have an impact on the price of Amazon and Microsoft and Google and all other stocks,” he says. “People will rebalance their portfolios in order to sell Apple to you.”

These spillover effects can be surprising and can even extend to unrelated stocks. For example, if BlackRock had sold its entire 6.8% stake in ExxonMobil during the third quarter of 2020, the resulting flows would have caused its stock price to fall by 62%, Van der Beck says. At the same time, shares of renewable natural gas company Clean Energy Fuels and retailer Walmart would rise by 9% and 2% respectively, the model says.

Van der Beck’s research suggests that some specialist funds can drive up the price of ESG stocks sharply, lowering the cost of capital for the companies they invest in. But ESG funds that hug the market benchmark too closely and invest in highly elastic stocks can have little effect on prices.

“An extremely green investor might invest only in the greenest firms but if those green firms are held by elastic investors they’ll just sell to you and the price remains unchanged,” Van der Beck says.

He claims the research can help investors cut through “flowery fund prospectuses” and identify ESG funds that have a “true” impact on the cost of capital for green firms. Every dollar invested in the iShares MSCI USA SRI fund pushes up the price of ESG stocks by \$5 and lowers the valuation of mining stocks by five cents, Van der Beck estimates. By contrast, a dollar invested in the DFA US Sustainability Core Equity Portfolio would cause the value of ESG stocks to increase by just 28 cents.

Successful impact investing, Van der Beck argues, relies on investing in green firms held by inelastic, often passive, investors. “Then you really drive up the price of those stocks and you can have a large permanent impact on valuation, resulting in a lower cost of capital [for the company].”

Valentin Haddad, associate professor of finance at the University of California, Los Angeles, says the research could help explain how flows can inflate ESG stock prices, despite what conventional theory says. Haddad’s own research shows that even if some hedge funds bet against heavily bought ESG stocks, they are unlikely to reverse the effect. ■

*Previously published on Risk.net*

<sup>1</sup> P Van der Beck (September 2021), Flow-driven ESG returns, [www.bit.ly/3AYPf6D](http://www.bit.ly/3AYPf6D)



# FSB debates how to fit climate risk into capital rules

Regulators ponder whether climate risk needs new risk-weighted assets or recalibration of existing ones. By Sharon Thiruchelvam

**R**egulators are still undecided on whether the risks associated with climate change can be handled within the existing bank prudential framework, or will need separate risk weights and capital add-ons, an official at the Financial Stability Board (FSB) has said.

Joseph Noss, head of vulnerabilities assessment at the FSB, told an event organised by the Institute for International Finance (IIF) on September 16 that climate risks are broad and non-linear, and that past data was a “poor guide” to the future crystallisation of these risks.

“Does that mean we need new policies, or are these just existing risk factors – market risk, credit risk, liability risk, all sorts of risk that colleagues on this panel are used to dealing with – on steroids?” said Noss. “If the latter, then how big are those steroids, and what does that mean for the calibration of capital buffers?”

The Basel Committee on Banking Supervision is continuing to explore whether climate risk drivers can neatly map onto the standard risk categories, or whether that would still leave gaps such that “climate-related financial risks may not be sufficiently addressed”.

The European Banking Authority (EBA) is the most advanced among global regulators in terms of examining how to integrate climate risk into the prudential rulebook. The European Commission originally asked it to produce recommendations by June 2025 on whether to alter the risk-weighted asset (RWA) framework to include climate risk, and has now moved this deadline forward by two years.

As a result, EBA executive director François-Louis Michaud told the IIF panel, the regulator will publish an initial discussion paper on the subject in late 2021 or early 2022.

Speaking on the same panel, Judson Berkey, head of sustainability regulatory strategy at UBS and chair of the IIF’s sustainable finance working group, urged global regulators to co-ordinate their work carefully. In particular, he suggested supervisory colleges could cement knowledge sharing and alignment, and help supervisors better manage banks with significant cross-border business. “Colleges can be a very effective tool to share the results across supervisors who may have a broader interest in a given firm,” Berkey said.

The IIF has proposed that the Basel Committee can play a key role in co-ordinating these colleges, which could help focus resources and research.<sup>1</sup> The EBA’s Michaud assured the audience: “We work hand in hand at the global level with my colleagues in the context of the Basel Committee to try to come up with something meaningful.”

## Climate stress tests

In addition to changing the RWA framework, regulators could devise capital add-ons based on climate risk stress testing. According to the IIF, 18 supervisors worldwide have been deploying stress scenarios around climate risk. The French regulator carried out a climate stress test earlier this year, and the European Central Bank plans something similar during 2022 for the eurozone banks it supervises.

Michaud said this would feed into ongoing discussions about whether to introduce a climate stress test programme across the European Union. The EBA is due to run its next EU-wide stress test in 2023.

“The extent to which there will be a climate dimension is not completely decided yet. We will be working on that, and that will also depend on the lessons learned by the ECB next year, and also on the lessons learned by other supervisors in what they’ve done recently,” said Michaud.

**“It’s impossible to answer these questions of calibration precisely given the lack of data”**

Joseph Noss, FSB

The FSB’s Noss acknowledged that there are significant difficulties deciding how to convert climate stress-test results into macroprudential capital buffers to protect against the systemic risk posed by climate change.

“It’s impossible to answer these questions of calibration precisely given the lack of data, but ... that shouldn’t stop us having a crack at trying to answer them, because these issues are urgent and clearly very important,” said Noss.

At present, the EBA and ECB dovetail their conventional stress tests that take place in alternate years, so banks in the eurozone will run a test each year either for the EBA or for the ECB. However, Berkey warned against trying to run climate stress tests every year, given that data collection and scenario design are still at an early stage.

“It takes a while to get models approved through our internal processes, [and] as we’ve seen with core financial stress tests, I think everyone would benefit from being able to really take on board the learnings, do that next round of investment in terms of capabilities, then potentially come back to them ... later,” said Berkey. ■

*Previously published on Risk.net*

<sup>1</sup> IIF (September 2021), Navigating climate headwinds: reference approaches for scenario-based climate risk measurement by banks and supervisors, [www.iif.org/publications/3pmmGc](http://www.iif.org/publications/3pmmGc)



# Climate laggards need to double their carbon cuts

Asset managers that wait until 2025 will have to cut emissions by 14% a year to limit global warming. By Will Hadfield

**W**hen an asset manager starts cutting portfolio emissions can make a huge difference to how much disruption it faces on the path to meeting its net-zero commitments, according to analysis conducted on behalf of *Risk.net* by MSCI, the index compiler.

Fund groups that put off emission cuts until 2025 will need to reduce the carbon footprints of their portfolios by 14% every year to reach net zero by 2050. Asset managers that began cutting emissions last year, however, need only reduce their emissions by 7% a year to achieve the same outcome.

A major report published in August by the Intergovernmental Panel on Climate Change, a group of scientists convened by the UN, concluded that “limiting human-induced global warming to a specific level requires limiting cumulative carbon dioxide emissions, reaching at least net zero”.<sup>1</sup>

Research by Andreas Hoepner, a financial data scientist at University College Dublin, suggests that cuts of 7% per year are needed

to achieve net-zero emissions by 2050 and limit global warming to 1.5 degrees Celsius above pre-industrial temperatures. The European Union used Hoepner’s work when it drafted climate regulations that only allow index compilers to call their products “climate transition benchmarks” or “Paris-aligned benchmarks” if the carbon emissions of their constituents drop by at least 7% a year.

Thomas Haehl, a consultant at MSCI, calculated how much carbon would be released into the atmosphere by 2050 if companies reduced emissions by 7% per year, starting in 2020. He then calculated the level of cuts necessary to achieve the same result if they waited until 2025. Delaying by five years doubles the size of the annual cuts.

Regulators in the EU and UK will require asset managers to disclose their Scope 3 emissions – the carbon emitted by the companies they invest in – from 2024, meaning that the first year-on-year

comparisons need not be published until 2025. The US and big Asian countries have yet to mandate any climate disclosures for companies.

A total of 128 fund groups that collectively manage \$43 trillion – almost half the world’s total assets under management – have committed to achieving net-zero emissions by 2050.

But only a handful have already started cutting emissions. Legal & General reduced the emissions from every £1 million it invests by 2.5% last year, while Axa lowered the emissions from every €1 million in its portfolios by 4.3%.

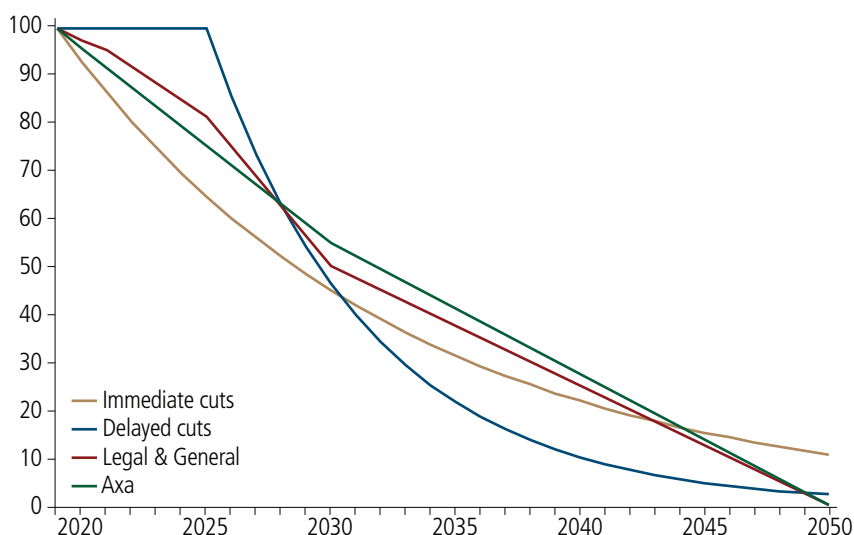
Both companies are ahead of their peers, but behind where the science says they need to be.

“We have committed to decarbonisation of 18.5% by 2025,” says Adrian Chapman, head of group climate asset liability management at Legal & General. “Because of the nature of that portfolio, we are not able to commit to a linear reduction. It’s credit and bond heavy. A lot of our portfolio is in long-dated bond-type investments.”





### 1 Absolute annual decarbonisation, normalised to 100



Emissions cuts needed to limit global warming to 1.5° Celsius above pre-industrial averages  
Source: MSCI, companies

The UK insurer wants the companies it invests in to change their ways. It has spent the past few years trying to convince them to emit less carbon. If that effort proves to be successful, Chapman says the emissions from L&G's portfolios will drop at a faster pace, enabling the firm to meet its targets.

"We want to use engagement first as our key portfolio-management tool and seek divestment as one of the last things we do," Chapman says.

"We are looking for the companies we invest in to decarbonise themselves without taking away our financing to support the transition. Over time, we expect that decrease to increase."

Legal & General has committed to halve its emissions by 2030, while Axa says it will lower its carbon by 45%. Both insurance companies declined to say by how much they will cut their emissions during each year of this decade.

The rival insurers are looking for investments that will profit from the transition to a low-carbon economy. They also want to root out potential losers.

"It's reducing the risks that we hold underperforming companies in the transition," Chapman says. "It increases the chance that we hold outperforming companies. Of course, we are looking to find outperformance."

Other big asset managers have made net-zero pledges, but have yet to make their first cuts. BlackRock and Vanguard, the two largest asset managers, have signed the Net Zero Asset Managers Initiative, which requires them to halve their emissions by 2030 and reach net zero by 2050.<sup>2</sup>

BlackRock's chief executive Larry Fink said in January that the firm will publish Scope 3 emissions for its clients' portfolios by the end of this year. A BlackRock spokesman declined to comment on MSCI's research for *Risk.net*.

Vanguard says it will publish its first annual report based on the Task Force for Climate-related Financial Disclosures, a body backed by the Financial Stability Board, in 2022. A TCFD report is an obvious place to publish an asset manager's targets for cutting emissions.

"We will be sharing our target in due course," a Vanguard spokeswoman says. ■

*Previously published on Risk.net*

<sup>1</sup> IPCC (August 2021), Climate change 2021: the physical science basis, [www.bit.ly/3C5R6aY](http://www.bit.ly/3C5R6aY)

<sup>2</sup> Net Zero Asset Managers initiative (2021), [www.bit.ly/3jnj1VS](http://www.bit.ly/3jnj1VS)



# Why new EU rules are fuelling greenwashing and how to stop it

Reporting requirements for environmental, social and governance funds may not solve the problem of greenwashing, but a list of harmful investments might. By Samuel Wilkes

Europe's new rules on sustainable finance were meant to help investors hunt out truly ethical funds. Instead, they have gifted sheep's clothing to the wolves: asset managers say many undeserving funds now declare themselves green.

Admittedly, the granular reporting requirements that come with an ethical label are not yet in force. But even when they do kick in, there is scepticism the fully-fledged Sustainable Finance Disclosure Regulation (SFDR) will combat greenwashing. Another fix may be necessary – such as a tool to identify environmentally harmful investments. The gloom over the regulation is palpable. “The SFDR is creating the greenwashing it was trying to avoid,” says a regulatory expert at a large asset manager.

## Need to know

- Asset managers say the Sustainable Finance Disclosure Regulation has been widely used to stick a green label on funds with questionable environmental credentials.
- The mass of self-proclaimed sustainable products is likely to grow as more funds adopt the dominant interpretation of the vague Article 8. So spotting truly responsible funds will become even harder.
- Some hope disclosure requirements for ESG products will expose undeserving funds once they come into effect. Others are sceptical, pointing to quirks in investor behaviour and the design of the rules.
- Managers suggest tweaking the rules to make firms report negative sustainability impacts for each fund.
- Two other potential solutions are in the works: minimum sustainability criteria for Article 8 funds, dubbed ‘light-green’, and an ‘eco-label’ for the most environmentally friendly retail products.
- The simplest way to stop greenwashing may be to set out criteria for identifying companies that cause particular harm to the environment – a so-called ‘red taxonomy’.

Another source – Eoin Fahy, head of responsible investing at KBI Global Investors – makes an equally downbeat prediction: “The disclosure requirements are so detailed and cover so many factors that I suspect not many investors will actually pay a great deal of attention to them, unfortunately.”

The current mislabelling of funds is attributed to the vague wording of the SFDR's Article 8. A fund can be classed as an Article 8 financial product if it promotes “environmental or social characteristics”, provided the fund justifies this claim and the companies it invests in follow good governance practices.

Julia Linares, a senior sustainable finance policy officer at conservation charity WWF, considers the Article 8 definition “extremely wide”, saying: “The slightest thing that is more sustainable than average actually qualifies and can be called Article 8.”

Article 8 funds have become known as ‘light-green’, reflecting the industry's present focus on environmental rather than social credentials and contrasting with Article 9 funds, dubbed ‘dark-green’. A stricter and less controversial definition of sustainability applies to these funds: they must have sustainable investment as their objective.

Funds that do not fall under either article are known as Article 6 products. Article 6 requires all funds to disclose how they take account of sustainability risks and how these are likely to impact their returns.

In theory, more detailed information about self-proclaimed Article 8 funds should help retail investors decide for themselves whether the funds are green in practice. But there are doubts such disclosures will actually weed out products with dubious environmental credentials – for reasons that have to do both with investor behaviour and the specific disclosure requirements.

Asset managers say there are several possible ways to stop the greenwashing inadvertently made easier by the SFDR. Potentially the simplest one is to create a taxonomy for companies that damage the environment. If funds disclosed what share of their investments is in such companies, investors should find it easier to separate the wheat from the chaff.

## Good marketing

Without regulatory changes, identifying green funds that deserve the label will become even harder as the universe of Article 8 funds is likely to expand.

And not because more truly sustainable funds will spring up, but because more plain vanilla funds will start describing themselves as light-green to fall in line with the dominant interpretation of Article 8.

The regulatory expert at the large asset manager explains why his firm currently has fewer Article 8 funds compared with competitors: “We thought we were being honest but in hindsight we wonder if we were foolish. If the whole market shifts like this [to Article 8], then we may get forced to do so too. But we don't think that really helps anyone.”

Another asset manager says it is considering reclassifying more of its Article 6 funds as Article 8, for the same reason.

But there is a more questionable motive for shoe-horning funds into Article 8: the label provides good marketing.

For example, some fund distributors and asset managers allow users to filter through products based on which SFDR article they fall under. And some distributors have told asset managers that only their Article 8 and 9 products will be made available to clients.

So, many asset managers have a clear motive for greenwashing. Unwittingly, with the murky Article 8, lawmakers have also given them the means to declare funds green, whether or not that is strictly true.

“The policy-makers have done this to try and make it easier for retail investors to invest sustainably,” says Fahy of KBI Global Investors. “In fact – on the current wording and the way it's being implemented – it appears to me that there is a risk that it may have made the situation worse.”

Linares of WWF is more emphatic: “SFDR was supposed to be kind of an anti-greenwashing tool but now, unfortunately, Article 8 is becoming a greenwashing label.”

*Risk.net* has identified a group of funds labelled Article 8 that are heavily invested in oil and gas producers, with one holding as much as 91% of its portfolio in such companies.



Managers of some of the funds have defended their light-green status by saying the investee companies do not engage in the most environmentally damaging extraction practices, such as fracking. That is the case with two funds run by BNP Paribas Asset Management, for example.

NN Investment Partners has also been able to justify the Article 8 classification for one of its funds that invests in oil and gas producers because it is underweight fossil fuels versus its benchmark. The fund also excludes companies involved in oil sands and thermal coal – particularly harmful activities – as do all Article 8 funds managed by the firm, according to its website.

### **“Crazy” flexibility**

According to three sources, the Article 8 definition has been made even more flexible by a Q&A on the SFDR published by the European Commission (EC) in July as it lists a wide range of activities that can mean “promotion” of environmental, social and governance (ESG) principles.<sup>1</sup>

The Q&A states: “The term ‘promotion’ within the meaning of Article 8 ... encompasses, by way of example, direct or indirect claims, information, reporting, disclosures as well as an impression that investments pursued by the given financial product also consider environmental or social characteristics in terms of investment policies, goals, targets or objectives or a general ambition.”

Brunno Maradei, global head of responsible investment at Aegon Asset Management, comments: “The commission has made the situation even worse by saying promotion can mean anything, including just issuing a report. To me that is crazy.

“You could have a fund that invests in tobacco and oil stocks and you produce an ESG report for this fund – which says the fund is terrible on ESG – and by doing that you have promoted an ESG characteristic, so therefore you might classify it as Article 8.”

Kristian Håkansson, head of product and marketing at SPP, a Swedish subsidiary of Norwegian fund manager Storebrand, believes most funds will be categorised as Article 8 in the future.

“So we are basically back to where we began,” he says. “You still have thousands of Ucits [retail] funds to choose from and they will all be Article 8 and you will be none the wiser.”

The proliferation of funds labelled as Article 8 since the SFDR came into force in March goes against the EC’s expectations for the regulation, according to Fahy of KBI Global Investors.

“They’re thinking about it as being a set of regulations that force extra disclosures. Their thinking certainly was – and maybe still is – that funds won’t want to offer Article 8 funds because if they do, they’ll have all those extra sets of disclosures,” he says.

Indeed, there were protestations from fund managers when detailed disclosure requirements were put out for consultation last year. These regulatory technical standards (RTS) were then published on February 2 this year, reflecting responses to the consultation.<sup>2</sup> The latest requirements, still to be adopted by the EC, have been relaxed compared with the 2020 version.



### Disclosures to the rescue?

Regulators will still be hoping that the disclosure rules are comprehensive enough to help investors filter out pseudo-Article 8 funds.

"The proposal of SFDR regulatory technical standards requires Article 8 and Article 9 SFDR financial products to disclose on an annual basis its largest investee companies and sectors, as well as the proportion they represent out of the total investment," says a spokesperson for Luxembourg regulator CSSF.

"Once the RTS will be adopted and mandatory, such type of disclosures will speak for themselves in the context of the fund examples presented," the spokesperson adds, referring to Article 8 funds that invest heavily in fossil fuel producers.

The EC plans to implement the disclosure rules on July 1, 2022, according to a letter it wrote to the European Parliament last July.<sup>3</sup> Not everyone is as certain as the CSSF that they will have the intended effect.

The main problem is investors may not look at the reported data – something asset managers say is common with financial and legal information they already publish. "A lot of retail investors are not very up to date on this at all, but if they are using anything, they will be using filters provided by distributors and execution-only platforms that filter through SFDR Article 8 funds and Article 9 funds," says Håkansson of SPP. "I don't think they will ever look into the annual reports and the pre-contractual information in a way that is meaningful for them."

But look they should, even for the simple reason that, eco-conscious investors can't otherwise be sure that the Article 8 fund they have their eye on carries the label on environmental rather than social grounds. Particularly diligent investors will also want to know whether the fund is aligned with their specific concerns – say, promoting biodiversity as opposed to reducing carbon emissions.

Investors using the services of an investment firm or a financial adviser will, in a way, be forced to consider the SFDR disclosures as the service provider will be obliged to ask about their sustainability preferences. Sustainability preferences cover the investor's view on a product's "principle adverse impacts", among other considerations.<sup>4</sup>

However, information on these negative sustainability impacts will not be readily available for each fund. The incoming SFDR disclosure rules will force asset management firms to report the indicators for all of their products in aggregate, meaning investors won't be able to compare individual Article 8 funds. What would help, according to three sources, is to impose this requirement on individual products.

Gavin Haran, head of policy for asset management at law firm Macfarlanes, is one of the people in favour of the change.

"If you look at the product level, then you can really measure if this is actually something that's good or bad for the environment? Is this mandate or this product doing good ESG things or bad ESG things?" he says. "I think that's a lot more useful often than looking across a company's entire portfolio."

Maradei of Aegon Asset Management makes a similar point, pointing to an SFDR requirement that he thinks should go further. Managers of Article 8 funds will have to disclose whether the fund takes into account principal adverse impacts, but it is a yes/no question that doesn't require any evidence to back up a 'yes' answer.

"What is missing is this next level down: at the fund level, [what are your] adverse impact indicators and what is the fund doing about them? The supervisors ... need to connect the dots a bit more before the legislation can have the right bite that they want it to have."

### Naughty or nice

There is another possible fix to the greenwashing conundrum – the EU's Taxonomy Regulation – but the success of this solution depends on a number of factors. From next year, the regulation will introduce a requirement to disclose what proportion of investments are sustainable according to a set of environmental criteria – that is, the taxonomy.

The first problem is that – based on EU regulators' latest interpretation of the Taxonomy Regulation – only a subset of environmental Article 8 funds will be subject to the requirement, in addition to all Article 9 products that pursue an environmental objective.<sup>5</sup>

Even for those Article 8 funds that will publish their so-called taxonomy alignment score, the score will rarely be an accurate reflection of reality because so far, the Taxonomy Regulation requires only some EU investee companies to disclose their share of sustainable activities.<sup>6</sup> On top of that, non-EU corporations release little sustainability information. So companies not subject to the EU Taxonomy Regulation will mostly receive a 0% score.

Until more companies are brought into scope or start publishing sustainability information voluntarily, enabling fund managers to estimate their scores, truly green funds will struggle to stand out from the crowd.

"If a very dark-green fund only has 5% or 10% of its investments complying with the taxonomy, then a fund with no green investments at all having 0% doesn't really mark it out as very different," says Fahy of KBI Global Investors. "When that extra information is published by companies, the percentages might well go up to 15%, 20%, 25%, or 30%. So that could be quite a game-changer if that happens."

Lastly, as with all disclosures, there is no guarantee retail investors will pay attention to the taxonomy alignment scores of Article 8 funds.

But that could change. Some fund managers have held up a new taxonomy, dubbed 'red', as the best remedy against greenwashing. Such a taxonomy would set out standards for identifying companies that are causing significant harm to the environment.

"That could have quite an impact on the Article 8 funds that are invested in oil. It would then become a stretch to characterise oil funds as Article 8," Fahy says.

An expert advisory body set up by the EC has recently consulted on developing such a taxonomy.<sup>7</sup>

Two further potential solutions don't rely on investors' working their way through fund disclosures.

One is establishing minimum sustainability criteria for Article 8 funds. This is something the EC said in July that it would consider, without elaborating.<sup>8</sup> The commission did not respond to a *Risk.net* request for more details. Choosing the criteria is unlikely to be a speedy process.

"It is a fraught discussion that is going to take a lot of consensus-building because then you get into a debate about what is a useful ESG characteristic," says Maradei of Aegon Asset Management.

The other fix is creating an entirely new 'EU Ecolabel' for the most environmentally friendly retail financial products, as proposed by an EC research centre.<sup>9</sup> However, asset managers have criticised the latest iteration of the proposal for setting excessively high thresholds for qualifying for the label. For example, retail equity funds must invest at least 50% of their portfolio in environmentally sustainable economic activities.

"Most likely there will [even] be Article 9 funds that won't make the eco-label because you need a concentrated portfolio to obtain 50%," says Håkansson of SPP.

What should responsible investors do in the meantime? Linares of the WWF offers a simple answer: "I would just try to find Article 9 funds that, although not perfect, shouldn't allow unsustainable exposures to be included." ■

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<sup>1</sup> *Esma* (July 2021), Question related to Regulation (EU) 2019/2088 of the European Parliament and of the Council of 27 November 2019 on sustainability-related disclosures in the financial services sector, [www.bit.ly/3poWTFy0](http://www.bit.ly/3poWTFy0)

<sup>2</sup> *The Joint Committee of the European Supervisory Authorities* (February 2021), Final report on draft regulatory technical standards, [www.bit.ly/3GbbOBM](http://www.bit.ly/3GbbOBM)

<sup>3</sup> *EC* (July 2021), Information regarding regulatory technical standards under the Sustainable Finance Disclosure Regulation 2019/2088, [www.bit.ly/3aVdw31](http://www.bit.ly/3aVdw31)

<sup>4</sup> *EC* (April 2021), Amending Delegated Regulation (EU) 2017/565 as regards the integration of sustainability factors, risks and preferences into certain organisational requirements and operating conditions for investment firms, [www.bit.ly/3E2k2L2](http://www.bit.ly/3E2k2L2)

<sup>5</sup> *The Joint Committee of the European Supervisory Authorities* (March 2021), Taxonomy-related sustainability disclosures, [www.bit.ly/3B4mYcV](http://www.bit.ly/3B4mYcV)

<sup>6</sup> *EC* (April 2021), FAQ: What is the EU Taxonomy and how will it work in practice?, [www.bit.ly/3aYGbE8](http://www.bit.ly/3aYGbE8)

<sup>7</sup> *EC* (July 2021), Call for feedback on the draft reports by the Platform on Sustainable Finance on a social taxonomy and on an extended taxonomy to support economic transition, [www.bit.ly/3DYuXQE](http://www.bit.ly/3DYuXQE)

<sup>8</sup> *EC* (July 2021), Strategy for financing the transition to a sustainable economy, [www.bit.ly/3G52k1X](http://www.bit.ly/3G52k1X)

<sup>9</sup> *EC* (March 2021), Development of EU ecolabel criteria for retail financial products, [www.bit.ly/30R8rad](http://www.bit.ly/30R8rad)



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