ING

Terra progress report 2020

Our approach to climate action

do your thing

Contents

Updated on 30 October 2020

"With the Terra approach, ING aims to be a positive force in the fight against climate change. Our approach is inclusive and collaborative. We work together with our clients to facilitate their transition to low-carbon technologies. At the same time, we've been working together with other banks and experts to define a methodology standard open for all banks to use. We believe this will ultimately help the financial sector to make a bigger impact. This report delivers on the promise we made last year to include all nine carbon-intensive sectors in 2020. I'm really proud of the progress we've made over the past 12 months and I'm looking forward to continuing to take the steps necessary to play a responsible and leading role in the fight against climate change."

– **Steven van Rijswijk, CEO of ING**

“We welcome ING’s continued efforts to steer their lending portfolio in line with the Paris Agreement, as well as their open exploration of challenges and dilemmas through the Terra reports. We are proud to work with ING and other global banks in making PACTA a more robust and more user-friendly climate-scenario analysis tool available for all banks worldwide.”

– **Maarten Vleeschhouwer, head of PACTA, 2° Investing Initiative**

1 Introduction

In 2018, ING announced our commitment to steer our lending portfolio in line with the goals of the Paris Agreement. In September last year, we presented the progress we had made in the first-ever annual Terra Progress Report 2019. In line with our commitment to update our stakeholders on how we continue to improve and progress each year, we now present our second annual Terra Progress Report.

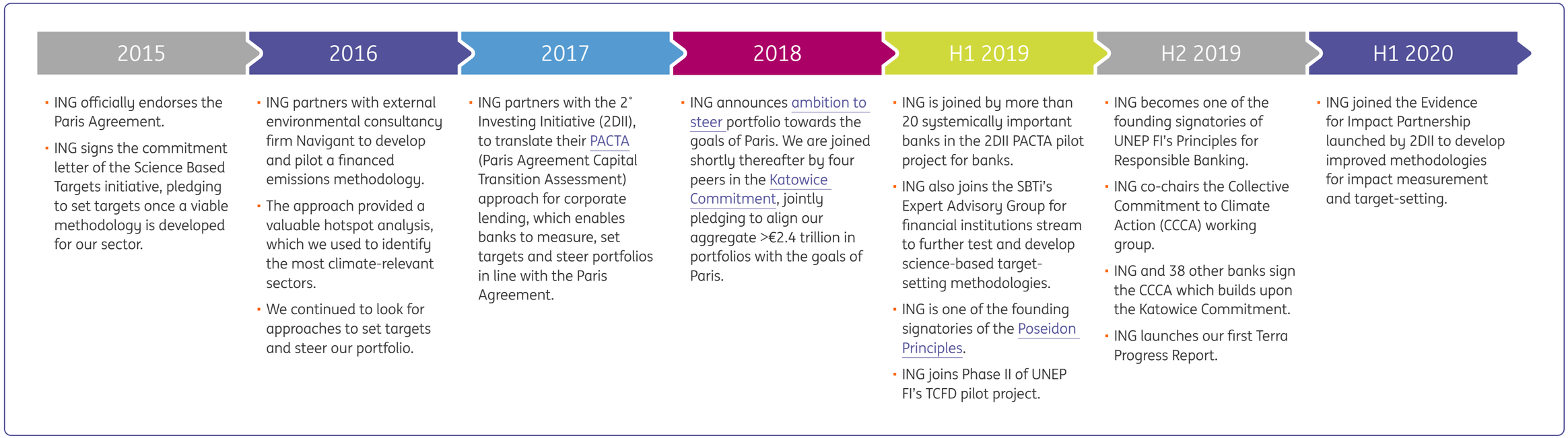
This report provides a status update on the alignment of our lending portfolio with the well-below 2°C goal of the Paris Agreement. It includes portfolio targets, timelines, opportunities and challenges. What's more, this year we provide quantitative results for the remaining four sectors in scope, which were not yet included last year.

Our journey

Much has taken place since last September, not only within our business but also the world. The global coronavirus pandemic is something most of us couldn't have imagined. We've seen the major disruptions it has caused, but we've also seen the way it has brought societies and communities together to tackle them. If 2020 has taught us anything so far, it's that we're an extremely interconnected global society. We're more dependent upon united and collective action for real, positive change than ever before. Tackling the threat of climate change is no different. As outlined in our first report, we believe that no one sector, much less one bank, can solve the climate crisis. This must be a collective effort through open collaboration with peers, civil society organisations, consumers, governments and regulators. And this collective effort must start at home, with us doing our part internally, so that we can make meaningful contributions externally.

To that end, ING has focused on improving, refining, developing and further embedding the Terra approach within our business. The first report presented our performance, portfolio targets, challenges and next steps for five of the nine sectors in scope. Since then, we have made progress developing the methodologies for the remaining four sectors. In particular, we have defined and/or refined methodologies for the fossil fuels, steel and aviation sectors by working intensively with our partner the 2° Investing Initiative (2DII) and with our PACTA pilot and 'Katowice Commitment' peers our most intensive collaboration being with the last, comprising Société Générale, BNP Paribas, BBVA and Standard Chartered (hereinafter referred to as the 'Katowice Banks'). We also worked closely with fellow signatories of the Poseidon Principles to develop a means to collect data and apply the methodology in order to report in line with our commitment in the shipping sector. We also refined the existing methodologies with updated emissions factors and more granular data in some sectors, such as automotive. With these improvements, we present to you the most complete view so far of the nine sectors currently within the scope of our Terra approach. This will remain a continuous process of learning, growth and getting better as data, methodologies and strategies improve over time.

Figure 1 ING's journey towards portfolio climate alignment action



Progress in our sector

Besides internal progress 'at home', we've seen momentum growing in the banking sector for portfolio climate alignment, particularly with the launch of the Principles for Responsible Banking (PRB) and the resulting Collective Commitment to Climate Action (CCCA) of the United Nations Environment Programme Finance Initiative (UNEP FI). ING served as co-chair for the drafting and agreement of the CCCA. More than 180 signatories have now signed up to the Principles for Responsible Banking, with 38 of them also signatories of the CCCA. This brings us ever closer to a new phenomenon in the market: that banks see themselves as proactive participants and change agents in the transition to a Paris-aligned world as we support and engage with clients to shift their investment practices.

This growing momentum is not unique to the banking sector. We see it across the wider financial sector as well, driven in part by national and international shifts

towards standards and requirements for climate reporting and sustainable finance, such as those emerging from the EU Sustainable Finance Action Plan, the Network for Greening the Financial System, the Loan Markets Association, the International Capital Market Association's (ICMA) Green Bond Principles (GBP) and the Financial Stability Board's Task Force on Climate-related Financial Disclosures (TCFD).

As collective action gains speed, transparency and clarity are both key to proper accountability. Portfolio climate alignment methodologies can be complex. The aim of the Terra approach, the underlying methodologies and the work we've done with 2DII and peer banks, has always been to reach conclusions that balance feasibility, accuracy (hinging on data availability and quality), comparability and communicability. To this end, two supporting and supplementary papers have been written and recently published by 2DII and peer banks with the support of or in collaboration with ING, namely the Paris Agreement Capital Transition Assessment (PACTA) methodology paper and the supplementary Credit Portfolio Alignment application paper written by the Katowice Banks. This report and supporting methodological documents, open-source tools and online tutorials are intended to provide the transparency and clarity needed for us to continue to be accountable to our stakeholders and for any bank to get started with measuring, setting targets and steering their portfolios in line with the Paris Agreement.

About this report

In this updated progress report, not only do we present the 2019 quantitative performance results for portfolio alignment across the nine sectors in scope and the methodological improvements achieved. We also provide in-depth insights into the strategies, achievements, challenges and opportunities in each sector. The report covers internal initiatives as well as how external, macroeconomic trends or shifts may affect each sector.

Among the global shifts witnessed these last 12 months, perhaps the most notable are those ushered in by the coronavirus pandemic. In the span of a few weeks, the global outbreak sparked an unprecedented public health and economic crisis that still affects the daily life and the wellbeing of societies and communities worldwide.[1]

Economically, the pandemic has of course also had an impact on ING's clients, especially those in the sectors covered by the Terra approach. This global crisis presents both challenges and opportunities for the energy transition; the balance differs per sector. In order to identify and transparently communicate how we see such impact affecting progress for ING, we have included a short summary of how the pandemic has affected each sector specifically.

1 For more information about how ING is supporting local communities and our global Build Back Better efforts, please see ING.com.

Additionally, this report includes a chapter on ING's sustainable finance strategy, products and services, which underpin our efforts to support clients' transitions. We conclude with how we are progressing with our 'theory of change', including a peek into the collaborative work we have accomplished with our peers via the PACTA pilot, the UNEP-FI's CCCA and more this past year. Before all of that, however, let us start by recapping our strategy for steering our lending portfolios towards the goals of the Paris Agreement: the Terra approach.

The Terra approach

Terra remains an approach built on a number of key attributes. It is an inclusive, forward-looking and engagement-driven approach that relies on science-based scenarios and asset-level data to align sector portfolios with the Paris Agreement. With Terra we focus on the sectors in our loan book generating the most climate impact, thus addressing sectors responsible for roughly 75% of direct emissions globally. Drawing upon two main methodologies for target-setting, namely the Paris Agreement Capital Transition Assessment (PACTA) and the Science Based Targets initiative's Sectoral Decarbonization Approach (SBTi SDA), Terra adheres to a number of underlying principles. Perhaps the most critical principle is that we steer our portfolio per sector. This **sector-based** approach respects the fact that each sector has its own transition pathway, or technology roadmap, for it to contribute to a low-carbon, 'below 2°C' world. The second key principle of Terra is that we prioritise **asset-level data** (ALD) for accurate measurement. The impact our clients make is driven by the types of vehicles, buildings, aircraft, ships and plants that they own, operate or produce. In other words: their assets. Real change will be at the core of our clients' businesses and their strategies for transition. Terra looks at the key shifts that each sector needs according to the relevant Paris transition pathway, and steers towards these changes.

This approach also provides opportunities for ING to work with clients on the challenges they face and support them on their journey. We use detailed insights into the trends and changes needed in each sector, which then facilitates discussions with clients about their own strategies. Ultimately, this sector-based approach allows ING to be more effective in steering each sector portfolio towards Paris, either through client engagement or by making choices about who and what we do or do not finance.

To be sure, this also comes with its own set of complexities. Taking a sector-based approach means that each sector must be treated, steered and monitored separately. It means that each sector has its own methodology, scope, portfolio target and metrics.[2] That's because each sector's transition pathway focuses on what the companies in that sector are producing. For example, in power generation, we look at what type of 'technology' is producing the power (e.g. wind turbines or gas-fired power stations). The table below gives an overview of our **Terra toolbox** of methodologies and the metrics used to set portfolio targets for each sector.[3]

2 The portfolio targets are determined by the applied scenario, which also differs by sector. For example, the energy supply sectors (power and fossil fuels) utilise the IEA's Sustainable Development Scenario (SDS), while the Beyond 2°C Scenario (B2DS) is applied to energy demand sectors, as it focuses more on the deployment of the most efficient technologies: a 'technology push'.

3 See Technical Annex for references.

Table 1 Terra toolbox of methodologies

Sector	Measurement Methodologies	Target-setting Methodologies	Metrics used
Power generation	PACTA [4]	PACTA	kg CO_2e/MWh
Fossil fuels (oil, gas and coal)	2DII / Katowice Banks	2DII / Katowice Banks	Reduction in € financed (upstream oil and gas; coal)
Commercial real estate (NL)	Delta Plan	Paris-proof method	kg CO_2/m²
Residential real estate (NL/DE)	PCAF [5]	SBTi SDA	kg CO_2/m²
Cement	PACTA	SBTi SDA	t CO_2/tonne cement
Steel	PACTA	SBTi SDA	kg CO_2/tonne steel
Automotive	PACTA	PACTA	kg CO_2/km
Aviation	PACTA	SBTi SDA [6]	g CO_2/passenger km
Shipping	Poseidon Principles (UMAS – FUSE)	Poseidon Principles	kg CO_2/tonne nautical mile

4 PACTA: Paris Agreement Capital Transition Assessment methodology of the 2˚ Investing Initiative, technology-based, utilising asset-level data and forward looking capital expenditure plans of clients (where possible).
5 PCAF: Platform Carbon Accounting Financials – carbon accounting framework which prescribes the use of building energy labels (EPC) as a proxy for CO_2 or energy consumption data for residential real estate.
6 SBTi/SDA: Science Based Targets initiative's Sectoral Decarbonization Approach – sets out sector decarbonisation pathways designed so as to be in line with IEA (ETP) B2DS scenario using intensity metrics.

Where you see a shift in our standard reporting approach is in the fossil fuels sector. Here, we don't apply a CO_2 intensity figure. Instead, as these are 'decline sectors' in terms of absolute production according to the IEA scenarios, we have committed to an absolute year-on-year reduction in our portfolio exposure to oil and gas as well as coal. In addition, we are committed to reporting on how these reductions, combined with our support of the renewables sector, will result in a shift from brown to green primary and secondary energy sources financed in relative terms over time, in line with the scenario production mix of the IEA.

What does this all mean? Well, the result is that we have set **one portfolio target per sector** in scope, providing a deeper level of transparency and more focused strategies sector by sector. By having targeted sector approaches, we believe we're better able to understand what's needed in each sector in order to move the needle and align our portfolio with the Paris Agreement.

We firmly believe methodological developments will continue over time. The journey is far from over. We are committed to working with our partner 2DII, our PACTA pilot peer banks and our fellow signatories to UNEP FI's Principles for Responsible Banking to further refine and develop our approaches. We invite more banks worldwide to join us.

2 Our progress

Over the last 12 months we have made significant progress in further developing, refining and applying the Terra approach. Terra has allowed us to understand our current performance compared to that of last year for five of the sectors in scope and has enabled us to benchmark our performance for all sectors against the respective climate pathways. As such, we have been able to set ambitious, time-bound portfolio targets for aligning with these science-based scenarios. This has mobilised our front office sector teams to set sector strategies in line with our ambition to steer portfolios towards the Paris Agreement and the corresponding portfolio targets.

This report presents the results of our analysis: ING's climate alignment per sector as measured by Terra via our Climate Alignment Dashboard. For ING, climate alignment is about steering our portfolios in line with the well-below 2°C goal of the Paris Agreement by their respective portfolio target dates. Being on track for portfolio climate alignment (green indicator) therefore means that we are currently on track with or are outperforming the scenario or our defined convergence pathway for this sector. An amber indicator shows sectors that are almost on track according to the above-stated definition as they deviate from the convergence pathway by a maximum of 5%. ING therefore considers a deviation of 5% or less to be within the bandwidth of performance which can be improved within a shorter timeframe. A red indicator, however, identifies a portfolio that deviates more significantly from the pathway and therefore will likely take longer to improve. This could be a result of a slow market transition or having a longer average loan tenure that requires a long-term strategy for client engagement.

In some cases, we display a grey indicator. For upstream oil and gas, this is because the 2019 portfolio is our starting point and we will need to see movement relative to the scenario pathway, starting next year, before indicator status can be given. For commercial real estate, this is because for 2018 we were only able to assess 60% of our Dutch portfolio while for 2019 we assessed the full portfolio. The additional 40% generally concerns the more energy-efficient buildings, making a fair comparison between 2019 and the Delta Plan convergence pathway (now starting at 2018) impossible. Unfortunately, it is not possible to recalculate the 2018 figure for the full portfolio. Once we get a market average, which will serve as the starting point for the Delta Plan scenario, we will be able to display an indicator for commercial real estate as well.

All figures are year-end 2019, unless stated otherwise.

The Climate Alignment Dashboard

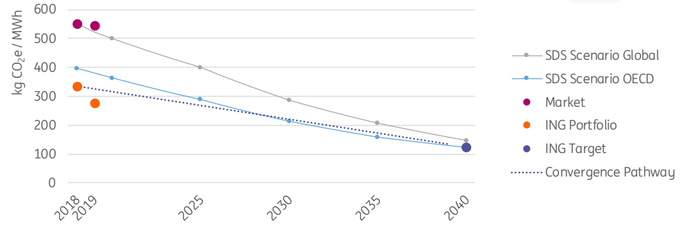
For data sources please refer to Table 5 'Data source by type and sector' in the Technical Annex.

Portfolio view - Outstandings as of year-end

Power Generation

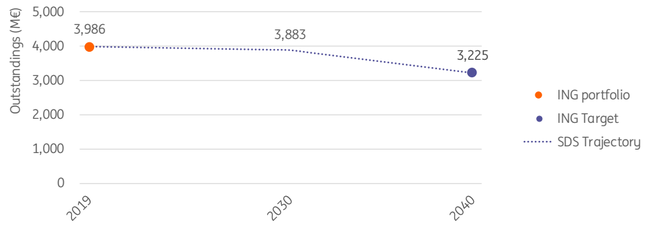
Global and OECD Decarbonisation Pathways

ING vs. pathway **-14.9%**



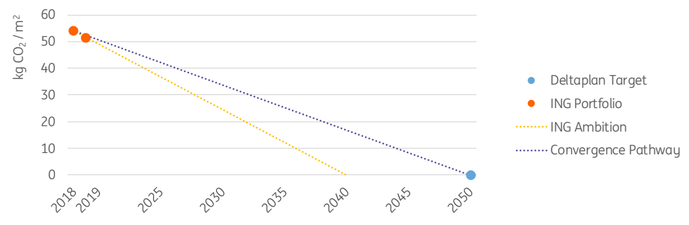
Upstream Oil & Gas

Absolute Financing Trend Reduction Pathway



Commercial Real Estate

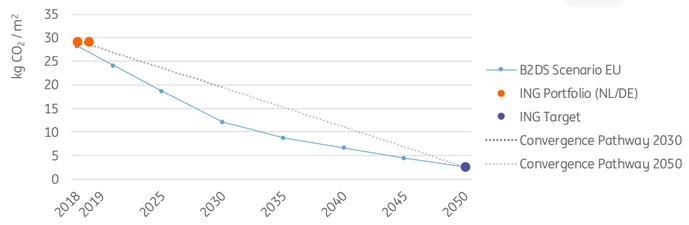
NL Decarbonisation Pathway



Residential Real Estate

European Union Decarbonisation Pathway

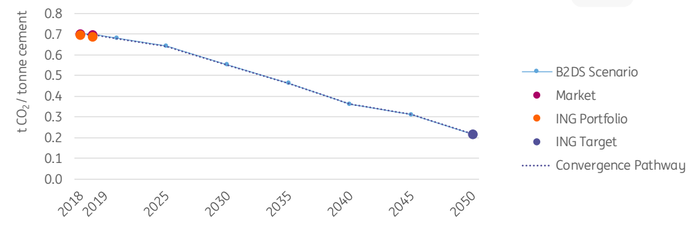
ING vs. pathway **+2.4%**



Cement

Global Decarbonisation Pathway

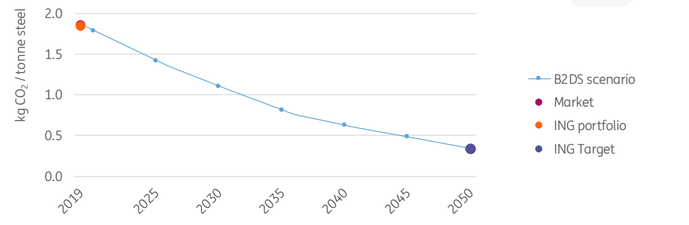
ING vs. pathway **-0.9%**



Steel

Global Decarbonisation Pathway

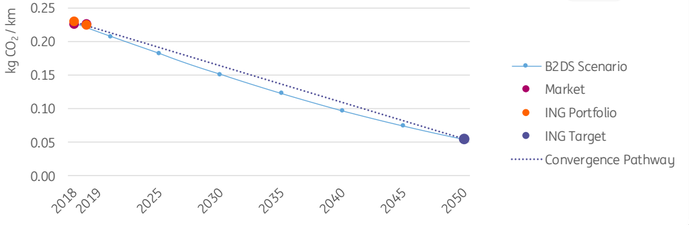
ING vs. scenario **-0.6%**



Automotive

Global Pathway to Zero Tailpipe Emissions

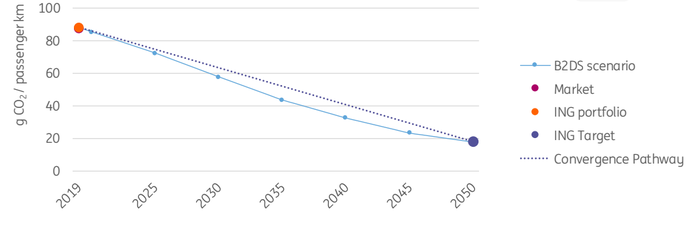
ING vs. pathway **+0.7%**



Aviation

Global Decarbonisation Pathway

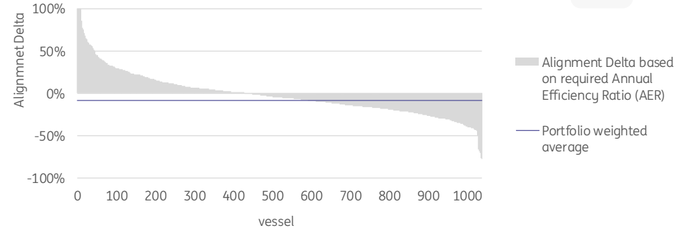
ING vs. scenario **+0.3%**



Shipping

Alignment delta

alignment delta **-8.1%**



On track: Under or equal to pathway or scenario Above pathway by up to 5% Not on track: Above pathway by more than 5% Unavailable

The Climate Alignment Dashboard shows the CO_2 intensity per sector of our portfolio (year-end 2019) compared to the market and the relevant climate scenario.[7] It also displays the climate alignment portfolio target per sector and ING's intended decarbonisation pathway per sector to converge towards the portfolio target.[8]

There are two exceptions. For oil and gas, we show the absolute portfolio reduction trend in line with the relative climate scenario with our 2019 upstream portfolio as our base year for reduction. And for shipping, we show the average alignment delta: the difference between actual and required annual efficiency ratio per vessel.

Each sector chart will be further discussed in the sector deep dives below.

Scope

As mentioned, the analysis focuses on the most climate-relevant sectors, measured by global carbon footprint (sectors globally responsible for approximately a combined 75% of total emissions). Within each sector, we look at the part of the value chain that generates most of the climate impact and that relates to the scenarios applied.

For example, within the power sector, it's the way power is generated that matters most – whether it's produced using renewable energy technology or by fossil fuel combustion. Similarly, for automotive, it's about the car producers and type of vehicle they produce – whether it's an internal combustion engine or a zero-tailpipe emission vehicle. In short, Terra's scope includes the parts of our portfolio that finance power generation, automotive producers, commercial and residential real estate owners, cement producers, steel producers, fossil fuel extraction, aircraft owners and shipowners (see Technical Annex for details).

How we steer

We have identified two main ways that ING can influence the CO_2 intensity of our sector portfolios: 1) by supporting and engaging with existing clients to shift investments more towards low-carbon technologies, and 2) by shifting our own capital allocation choices more towards low-carbon technologies and away from high-carbon. One example is to reduce our financing of sectors that require a decline in production over time to meet the Paris goals, such as coal and upstream oil and gas, while financing more renewables.

Regarding the latter, ING increased our renewable power generation financing by €1.19 billion in 2019 while reducing our direct exposure to coal-fired power plants by 43%.[9] This year, we also announced our commitment to reduce our financing to upstream oil and gas by 19% by 2040, in line with the Sustainable Development Scenario production trend. In commercial real estate, we also saw an increase to a total of 65% of A-C label buildings in our commercial real estate portfolio, in line with our ambitious 2019 goal. In shipping's first year of reporting, ING's portfolio has been outperforming the required annual efficiency ratio by 8.1%.

7 See technical annex for definitions and methodological explanations for arriving at intensity metrics.
8 While the decarbonisation pathway is indicative of the direction of travel our portfolio needs to take in order to achieve the portfolio target, we expect that circumstances will change as we move along the transition pathway. However, these short-term changes should not imply that we cannot achieve the long-term portfolio target, which is prevailing.
9 ING Annual Report 2019, p. 431.

Regarding the former, Terra is first and foremost an inclusion-based strategy. ING believes that we can make the most impact by supporting clients with our products and services, while working with the banking sector to scale and leverage this impact. To support client engagement, we've been road-testing client-level climate alignment dashboards that provide in-depth analyses of how individual clients' current performance and future strategies compare to climate scenarios, peers and the market.[10] This facilitates more focused engagement with clients, which ideally leads to positive change and greater impact. However, it's important to note that client engagement is a long-term strategy that can take more time than simply divesting. Nevertheless, we believe client engagement will have more impact and be more effective as more and more banks adopt a similar approach.[11]

In addition, while we engage with and encourage clients in their transition, we acknowledge that, as a financier, we are merely a facilitator. They are ultimately the leaders of their own change, and we can only help them realise their goals. The CO_2 intensity of our portfolios is therefore also a reflection of the choices and strategies of our clients as well as the economy from a global perspective.

As we move ahead with our strategies for steering, we will continue to be a leader in sustainable finance, building on our track record of sustainability innovations like the sustainability improvement loan. We are also maintaining our leading position in the green bond market and have one of the strongest sets of environmental and social risk policies in the industry, including our stance on coal.[12] For detailed information on our sustainable finance strategy, products and services, see chapter IV below.

This comprehensive set of policies, due diligence processes, ambitions and targets for risks as well as opportunity support us in our climate goals. However, it's important to note one thing. While aligning with the Paris goals would mean reducing the CO_2 intensity of our portfolios, it wouldn't necessarily mean that CO_2 intensity will be reduced for the global sector. Nor would it mean that ING itself would reduce emissions in the real economy by not financing certain clients or sectors. This is not the claim we are making. Those companies may still exist, even if we aren't the bank providing them with finance.

This is why we value an engagement-centred approach, supporting existing clients' transition pathways, bringing about real change. In addition, we recognise that a challenge this big will be met only through a concerted multi-stakeholder effort involving regulators, financiers, governments and consumers alike. For more information on ING's vision for engagement and impact, see the conclusion chapter.

TCFD recommendations and the Terra approach

Climate risk management and climate portfolio alignment are two very distinct endeavours. The former focuses on reducing financial risks as a result of the climate transition or physical risks stemming from climate change. The latter seeks to proactively shift a portfolio to contribute positively to climate goals. Still, although different, they can also be complementary. A more climate aligned portfolio could

10 See technical annex for details regarding the client-level analysis and how we steer internally. Forward-looking data is not available for all sectors, for example Commercial and Residential Real Estate.
11 To test the effectiveness of engagement strategies versus. divestment strategies, our technical partner, 2DII, has launched the Evidence for Impact Partnership to study the outcomes of these strategies over time. ING has been a member of this partnership since its launch in 2020.
12 https://www.ing.com/Sustainability/Sustainable-business/Environmental-and-social-risk-policies.htm

be one that faces lower transition risks, for example. However, risk mitigation doesn't ensure portfolio alignment, and an aligned portfolio is not inherently climate risk-free. Nevertheless, we do see our efforts within Terra as also supporting our efforts to follow the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD). Here's how.

The TCFD recommendations focus on providing disclosures around the governance, strategy, risk management, metrics and targets related to climate risks and opportunities. The Terra approach has facilitated disclosures on several of these themes. In 2018, we formed a governance structure to manage our climate-related risk and opportunities, where Terra is a set agenda item.

By going through the process of assessing each sector with the Terra approach, we're able to determine the CO_2 intensity of each client and sector in scope. This has led to sector-level discussions on suitable strategies to lower CO_2 intensity according to the goals of Paris, including relevant metrics and targets. We again aim for an integrated approach.

Although Terra focuses on our alignment with climate scenarios and support of clients and society to meet climate goals, it also provides relevant information on sectors more prone to climate-change risks. This further informs our risk-management strategies. It can be viewed as a proxy to transition risk as it can pinpoint under- or over-exposure to low-carbon or high-carbon technologies. However, while Terra doesn't currently quantify financial risk, it can supplement financial risk metrics.

In sum, the results of the Terra approach, powered by methodologies such as PACTA and the SBTI SDA, are relevant to organisations reporting in line with the recommendations of the TCFD as they provide insight into whether or not certain portfolios are aligning with climate scenarios. The insights also provide metrics for target-setting and reporting, while also informing strategies within our sectors, as presented in this paper.

For an overview on climate risk management, please refer to our standalone report that will be released later this year.

3 Sector deep-dives

Power generation

- Our performance
- Our initiatives
- Sector outlook and challenges
- Next steps

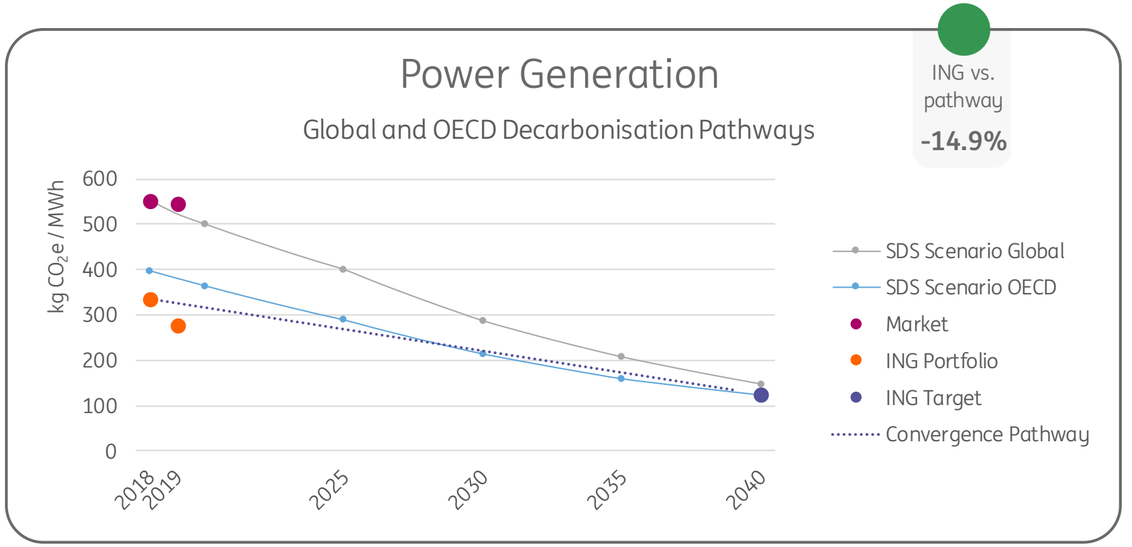
Power generation

Power generation	
Outstandings in scope	€7.5 billion

The power generation sector was responsible for 41% of all energy-related CO_2 emissions in 2019.[13] Power generation therefore remains central to the energy transition. While demand for electricity increased globally, emissions from the power generation sector declined by 1.3% in 2019 with an emissions intensity decrease of 2.5% up from 1% in 2018 thanks to an increase in low-carbon generation of 5.6%. Despite two decades of growth in renewable power generation and the emissions reductions seen in 2019, the sector was globally not on track to align with the Paris goals, which requires an annual decline of 4% of total power generation emissions.

The events of 2020, however, present a new picture, with low-carbon power poised to break records in its share of global power generation, an expected 40% in 2020, compared with an expected 34% for coal globally.[14] While the pandemic has presented unprecedented challenges and perils for society, we do see opportunities, particularly in the power sector, for society to build back better in the years ahead. And, at ING, we are ready to do our part in facilitating this.

Figure 2 Power generation decarbonisation pathway



Our performance

ING's power generation portfolio within the scope of Terra (€7.5 billion, including rooftop solar) is largely concentrated in OECD countries (approximately 90% of total outstandings) and, to a lesser extent, in non-OECD regions (approximately 10%).

In the chart above, ING's power generation portfolio is compared with the global market and the SDS scenario pathways. For power generation, we display both the global SDS pathway and the OECD SDS pathway, which is slightly more ambitious than

13 https://www.iea.org/reports/tracking-power-2020
14 https://www.iea.org/reports/the-covid-19-crisis-and-clean-energy-progress/power#abstract

the global SDS pathway. It is the more ambitious OECD pathway that has determined our portfolio target (and convergence pathway). This is due to the concentration of our business within the OECD despite having a global business. However, as our portfolio may shift its concentration over time, it is relevant to show our portfolio in relation to both scenarios.

In light of this, ING's power generation portfolio continues to outperform the market and both scenarios and has also seen a significant reduction in CO_2e intensity since 2018.[15] This is largely because ING has continued its focus on renewable energy financing and a significant share of the portfolio is made up of low-carbon power generation exposure. We also continue to further reduce our coal power generation financing in line with our commitment to reduce our exposure to coal-fired power and thermal coal mining to close to zero by the end of 2025.[16]

For information on the power generation methodology applied, please see the PACTA methodology paper, the Katowice Banks' Credit Portfolio Alignment paper and the Technical Annex in this report.

Our initiatives

As we continued our significant support of renewable power generation in 2019, with 55% of our portfolio's production being in low-carbon power generation, we have made progress in supporting our clients' and the sector's energy transition towards the carbon intensity milestones that mark the energy transition pathway set out by the IEA's Sustainable Development Scenario (SDS). The SDS for the OECD region requires a carbon intensity of 137 kg CO_2e/MWh in 2040, applying the emissions factors of 2DII.

In order to further align with our set pathway and portfolio target, our strategy will continue to focus on the two main drivers: 1) continued strong support of renewable energy financing and 2) reducing our exposure to coal-fired power generation. The Terra insights enable us to track our progress and support clients as they transition while making strategic choices in our own capital allocation.

ING is also committed to innovation in sustainable finance products. In 2019, ING's portfolio grew by €1.19 billion in financing renewable power. One notable transaction was one in which ING was the Sole Mandated Lead Arranger for the first green loan in ASEAN that is compliant with the Loan Market Association (LMA) and the Asia Pacific Loan Market Association (APLMA) Green Loan Principles for a portfolio of rooftop solar projects. This S$50 million loan, which is being used to finance an approximately 50MW portfolio of rooftop solar projects, will be developed and owned by Sunseap Commercial Assets Pte. Ltd.[17]

15 ING's Terra Progress Report 2019 reported an emissions intensity of 289 kgCO_2e/MWh. However, we are updating and restating this figure on the basis of more granular emissions factors and a refined application of the methodology calculation. This results in a restatement of the base year emissions intensity. Applying these updates, the emissions intensity of ING's power generation portfolio in 2018 was 335 kgCO_2e/MWh.
16 ING's coal policy applies to both thermal coal mining and coal-fired power generation.
17 www.ingwb.com

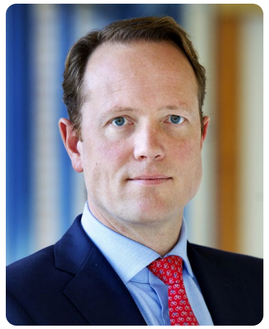
Another notable project is Windpark Fryslân, a project that will be Europe's largest lake wind farm when completed. ING joined nine other European banks in this €700 million financing deal that will build 89 wind turbines with a total capacity of 382.7MW, generating electricity for close to half a million households.[18]

Sector outlook and challenges

Impacts of the coronavirus crisis

While 2019 saw strong growth in renewable power generation, this is expected to slow as a result of the coronavirus crisis, although less so for renewables than for fossil fuel-based power generation. The global pandemic has led to widespread lockdowns in order to contain the virus, resulting in an average monthly decrease in power demand of 20% for every month of full lockdown.[19] Because renewables enjoy lower operating costs, have no fuel costs and benefit in most jurisdictions from some form of support, this, together with reduced demand, contributed to an increase in the relative share of renewables in the power sector to a record 40% in 2020.[20]

Despite a slowdown in new construction as a result of lockdown measures and supply chain disruptions, renewable power generation remains poised for growth – an expected 6% in 2020. In many cases, the expectation is for projects to be delayed, not cancelled, putting them back on track in 2021 once the pandemic subsides.[21]



"In facing the economic challenges caused by the pandemic, we remain committed to supporting our clients in their ambition to accelerate the build-out of renewable power generation capacity. To which the continued decrease in the carbon intensity of our power generation portfolio is testimony."

– Michiel de Haan, global head of Energy Sector, Wholesale Banking

18 www.ingwb.com
19 https://www.iea.org/reports/the-covid-19-crisis-and-clean-energy-progress/power#abstract
20 Ibid.
21 Ibid.

Several macro-economic factors, largely exacerbated by the pandemic, may slow or impede some clients' transitions and the further growth of renewables at the pace needed to achieve the Paris goals. We see the following factors presenting a number of challenges that could impede ING's overall ability to meet the SDS scenario target over its horizon:

- Global decline in power investments in 2020: as a result of the pandemic, power investments are expected to decline by an estimated 10%, a stark reversal from the expected 2% growth at the start of the year. Investment declines are expected to hit coal and gas-fired generation more significantly than renewables, although renewables are also impacted. Distributed (small-scale) solar PV in particular has seen a substantial decline as residential and corporate investment in installations has slowed.[22]
- Addressable market: in addition to the decline in investment, 95% of global investment in the energy supply is undertaken or incentivised by governments. Ignoring all other limiting factors (such as country suitability and credit risk and return considerations) this greatly restricts the financing opportunity available for funding by banks.[23] This also makes government policies a critical lever in dampening the impacts of the pandemic.
- There is also an increasing trend towards the use of other non-bank sources of funding for these smaller projects (leasing, equity or crowdfunding), although still driving forward the energy transition, which could negatively affect ING's ability to achieve its ambition with the Terra approach.

Next steps

- ING will continue to work with clients to support their ambitions and strategies to transition in line with the Paris goals.
- We remain committed and are on track to reduce our exposure to coal-fired power generation to close to zero by 2025.
- We will engage with peers and other stakeholders to improve and refine our strategies continuously to measure, steer and report on progress in the power sector.
- We will continue to report transparently on our progress to meet our 2040 portfolio target.

22 https://www.iea.org/reports/world-energy-investment-2020/power-sector
23 IEA World Energy Outlook 2019.

Fossil fuels

- Our performance
- Our initiatives
- Sector outlook and challenges
- Next steps

Fossil fuels

Fossil fuels	
Outstandings in scope – upstream oil and gas	€4.0 billion
Outstandings in scope – thermal coal mining	€70 million

The fossil fuels sector comprises the coal, oil and gas sectors. Oil, gas and coal are used globally in a wide variety of ways, including energy generation (mainly electricity, heating and transportation), and the production of plastics, steel, medicines, construction materials, fertilisers, and many other products. As such, the sector is vital to the functioning of the global economy, and its products are used daily by nearly the global population. Historically, the fossil fuels sector has provided the vast majority of the global primary energy supply. Today, fossil fuels account for 81% of the global primary energy demand. The burning of fossil fuels to create energy generates 65% of global greenhouse gas emissions.[24,25,26]

Our performance

This report marks a number of firsts for ING in the upstream fossil fuels sector. This is the first year we disclose our upstream oil and gas and thermal coal mining portfolios within the Terra Progress Report, and it marks a first for setting portfolio-level targets for upstream oil and gas. As reported last year, we were not yet prepared to include fossil fuels in our 2019 Terra Report as the methodology was still under development. We worked intensively over the last several months with our peers in the Katowice Commitment and our partner 2DII to review a longlist of metrics and approaches. We reviewed a total of 10 indicators and eventually narrowed this down to three which follow three key alignment pathways:

1. **An absolute reduction in fossil fuel financing**
   Carbon emissions must peak in 2020 and decrease at a significant rate according to most below 2°C scenarios (e.g. the IEA SDS) if we are to meet the objectives of the Paris Agreement. As a result, a net reduction in fossil fuel activities is advised for thermal coal, oil and gas, albeit at different speeds.

2. **A relative reduction in fossil fuel financing compared to low-carbon alternatives**
   In parallel, the fossil fuels sector portfolio combined with the power generation portfolio (reported separately) should demonstrate a transition from high-carbon to low-carbon and renewable energy production, aligned with the changes in the energy financing mix over time set out in the IEA SDS transition pathway.

24 The 65% figure is calculated as the ratio between total 2018 CO_2 emissions coming from burning fossil fuels as reported from the IEA (https://www.iea.org/) over the total anthropogenic GHG excluding land use change as per provided references.
25 International Energy Agency World Energy Outlook (WEO), 2019.
26 Trends in global CO_2 and total greenhouse gas emissions, PBL, 2019.

3. **A transition towards lower-carbon fossil fuel extractive processes**
   More comprehensive and comparable data on the GHG emissions of oil and gas production at well head and field level is now becoming available. This data can be used to steer the fossil fuels sector portfolio towards the companies which produce at the lowest emissions intensity.[27]

The table below describes the three indicators that support these three pathways.

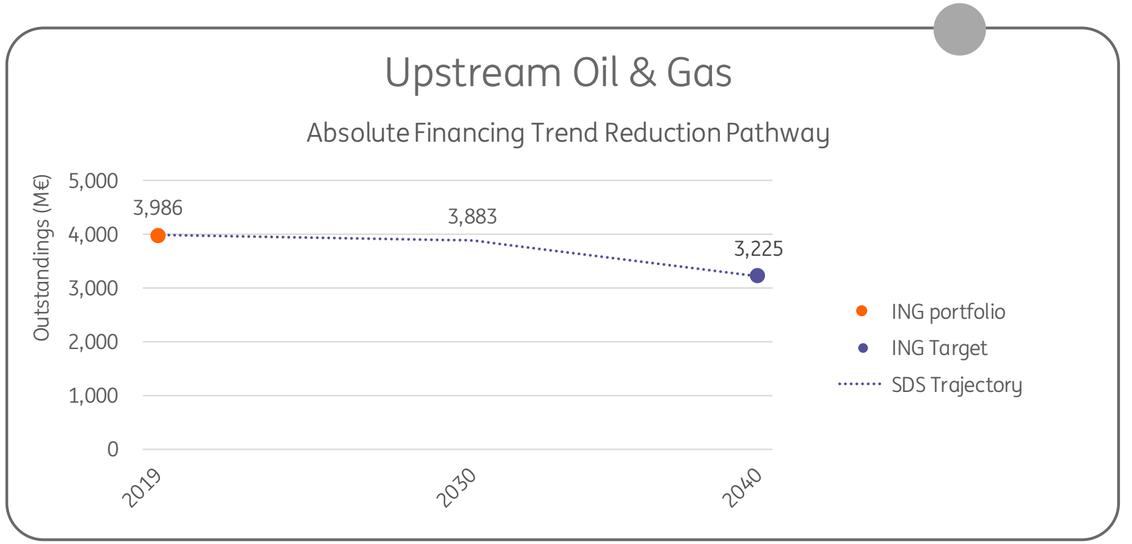
Table 2 Fossil fuel indicators and alignment drivers as defined by the Katowice Banks and 2DII

Indicators	Alignment drivers
Portfolio financing trend	Absolute reduction in fossil fuel financing
Energy financing mix	Relative transition of the energy financing mix from high-carbon to low-carbon and renewable energy production, aligned with the IEA SDS transition pathway
Emissions intensity	Shift towards companies which produce at the lowest emissions intensity

While these three indicators have been identified by the Katowice Banks and 2DII as viable means to demonstrate alignment, not all three indicators have reached the level of maturity required for reporting. In particular, the emissions intensity indicator requires further data maturity and better models for robust application. ING will therefore continue to work with peers, technical partners and the sector to refine this approach for future application. In the meantime, ING is committed to reporting on the portfolio financing trend indicator (below). We will steer our fossil fuel production portfolios in accordance with the scenario trends as a minimum for achieving alignment. In addition, ING plans to apply the energy financing mix indicator and is working towards publishing this in our next update.

Figure 3 shows ING's portfolio and targets in accordance with the portfolio financing trend indicator which applies the IEA SDS scenario production reduction trends as a proxy for the rate at which portfolio financing should reduce. As such, ING is committing to reduce its financing to the upstream oil and gas sector by 19% by 2040 compared with 2019 levels.

Figure 3 Upstream Oil & Gas Financing Reduction Pathway



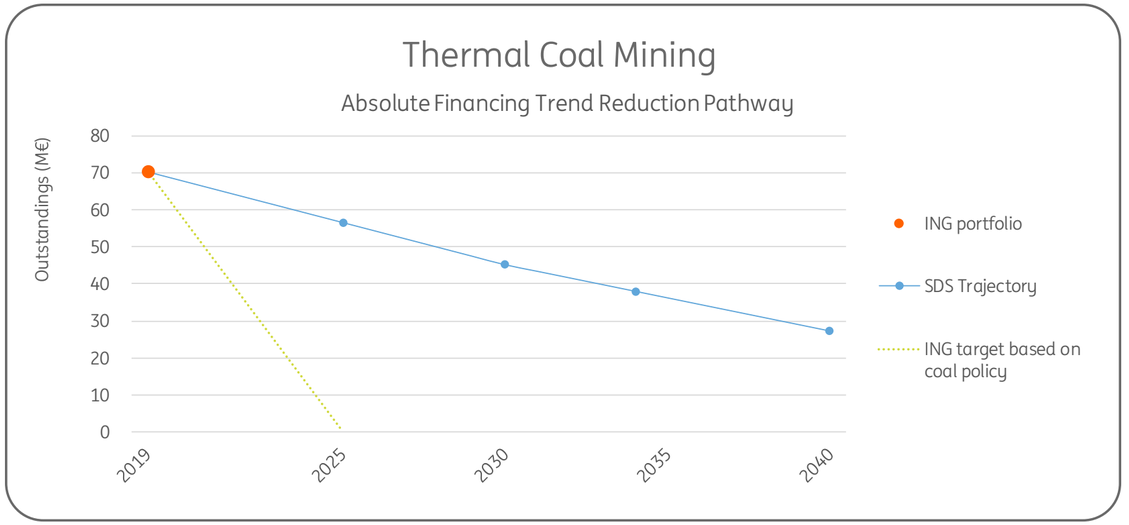
27 Credit Portfolio Alignment – An application of the PACTA methodology by Katowice Banks in partnership with 2DII.

Our Terra commitment for fossil fuels is calibrated to the SDS. The SDS starts from an assumption of Paris Agreement success in the mid-century and backcasts to the present day. It sets out the energy transition pathway of what would need to be done to achieve Paris Agreement alignment in the most realistic, economic and socially responsible way.

By committing to align our upstream oil and gas lending portfolio to the energy transition pathway (the changing future energy mix) of the SDS, we acknowledge that, as every year passes in which the global economy remains out of alignment with the transition pathway, the future task of alignment within our own lending portfolio is likely to become ever more demanding. If the SDS transition pathway requires a greater decline in oil and gas production, at a faster rate, that scenario will guide the direction that ING will take.

Figure 4 shows the same indicator for our thermal coal mining exposure. However, in line with ING's policy to reduce our portfolio exposure to thermal coal mining (and power generation) to close to zero by 2025, ING's target is far more ambitious than the SDS scenario proxy.

Figure 4 Thermal Coal Mining Financing Reduction Pathway



Our initiatives

ING has a long history of supporting clients in the energy sector across a range of activities, including conventional and renewable power generation, as well as the fossil fuels value chain. Our client relationships, combined with our knowledge and expertise in all aspects of the energy sector, enable us to anticipate and steer down the energy transition pathway. From replacing fossil fuel power generation with renewable sources, to developing new energy technologies and markets, to ensuring that where oil and gas is required by other sectors of the global economy that cannot yet substitute it with renewable or low-carbon alternatives, we focus on financing production with the highest social and environmental standards.

Following the Paris Agreement and our own strengthening of our commitment to sustainability and action against climate change, we put in place new strategies, policies and lending criteria for fossil fuels.

Coal

ING's coal policy was significantly strengthened in 2017 by a commitment to reduce our thermal coal-related lending exposure to close to zero by 2025 in a gradual and responsible manner. This includes all thermal coal mining and related infrastructure as well as thermal coal-fired power generation.

Upstream oil and gas

Credit assessments include a strong focus on environmental and social impacts, in addition to production costs. By concentrating on low-cost production, we work together with our clients to ensure that their businesses are resilient to the risk of 'stranded assets'. More extensive and reliable data is now becoming available on the emissions intensity of production at field level. We will use this to steer our client base and lending exposure towards the low-emissions leaders.

Energy sector as a whole

A multidisciplinary team of renewables, utilities and oil and gas specialists is leading our New Energy Technologies Initiative (NETI). The team works with clients, policymakers and industry platforms to address finance issues. These issues relate to the commercial deployment of low, zero or net-zero carbon technologies such as hydrogen, energy storage, and carbon capture utilisation and storage.

> "No energy company will be unaffected by clean energy transition. Every part of the industry needs to consider how to respond. Doing nothing is simply not an option."
>
> – Dr Fatih Birol, IEA Executive Director in The Oil & Gas Industry in Energy Transitions, IEA, 2020

It's essential to engage with external stakeholders on the energy transition while continuing to be selectively involved in the oil and gas value chain. ING energy sector representatives have taken leadership roles in initiatives such as the UNEP FI Principles for Responsible Banking's Collective Commitment to Climate Action and the oil and gas working group of UNEP FI's TCFD Pilot Project for Banks.

Sector outlook and challenges

The fossil fuels sector comprises coal, oil and gas. These fuels are used globally in a wide variety of ways, including energy generation (mainly electricity), heating and transport, as well as in the production of plastics, steel, medicines, construction materials, and fertilisers. As such, the sector is vital to the functioning of the global economy, and its products are used daily by nearly all the global population. Historically, the fossil fuels sector has been responsible for the vast majority of the global primary energy supply. Today, fossil fuels still account for 81% of the world's primary energy demand.[28] Fossil fuel use accounts for 65% of global anthropogenic GHG emissions, with electricity and heat production accounting for 31% of the global total. While global CO_2 emissions from all fossil fuels grew from 2018 levels, the power sector accounted for over two-thirds of that growth.[29]

Companies operating in the fossil fuels sector can be split into two main categories: those active in the extraction of fossil fuels from the subsurface (upstream), and those active in the transport, processing trading and marketing of fossil fuels (midstream and downstream). The International Energy Agency (IEA) Sustainable Development Scenario (SDS) scenario focuses on fossil fuel demand and production levels over time. Given this focus on the changes in future production volumes required for a successful energy transition pathway, we consider the upstream activities of the sector to be most relevant for the future assessment of alignment with the SDS.

28 International Energy Agency World Energy Outlook (WEO), 2019.
29 Global Energy & CO_2 Status Report, International Energy Agency, 2019.
30 World Energy Outlook, IEA, 2019.

Global outlook

The Sustainable Development Scenario[30]

The SDS depicts an energy transition between now and 2040 with a starting point that considers several desired outcomes aligned with the below 2˚C goal, as well as the energy-related elements of the UN Sustainable Development Goals.

The SDS then works back from there to define the most environmentally, socially and economically efficient transition pathways that each energy-related sector will need to follow in order to achieve these goals. For the fossil fuels sector, this will mean a number of changes:

- Coal use declines steeply to around half of 2019 levels by 2050, due to transition in the power generation sector, as gas and renewables become more cost-competitive. However, it continues to be used in industry, mainly for the production of cement, iron and steel.
- Oil demand peaks within the next few years and then falls to 50 million barrels per day (mb/d) in 2050 from close to 97 mb/d in 2019. The use of all oil declines steeply for passenger cars (electric vehicle uptake), while the non-energy and non-emitting use of oil (e.g. plastic feedstock and asphalt) rises to 40% of overall final consumption, according to the scenario.
- Natural gas use increases until the late 2020s as it plays the role of a 'transition fuel', replacing more polluting fuels alongside the growth in renewable sources and the electrification of the economy. From the 2030s onwards, consumption of natural gas declines steadily, because its emissions intensity is too high to be consistent with the required future reduction in CO_2 emissions.

- While efficiency and renewable energy can provide most of the emissions reduction, more technologies are needed as emissions become increasingly concentrated in hard-to-abate sectors of the wider economy. Investment in new fuels and technologies, such as energy storage, biomethane, hydrogen, and carbon capture utilization and storage (CCUS), will be required.

Impacts of the coronavirus crisis

The full current and future impact of the pandemic is still unfolding, but there is no doubting that it has affected the oil and gas industry severely. The industry has a long history of managing through shocks and changes in its sometimes volatile markets, but the current price collapse – the third in 12 years – is generally acknowledged to be distinctly different, with its unique combination of market oversupply combined with abrupt and deep global demand disruption due to the pandemic.

For ING, we do acknowledge that the pandemic could have an effect on our ability to steer our lending exposure in the near term as clients face economic challenges requiring additional support from banks. It can also mean a decrease in scheduled amortisation, causing a temporary halt to portfolio decrease. This could mean that for the coming year or two, our portfolio trend in upstream oil and gas will not be on track for portfolio alignment. However, our commitment to achieve the 2040 goal has not changed, and we will continue to work towards this goal in the coming years.

We also acknowledge that the effects of Covid-19 and government policy changes may cause our portfolio to follow a more progressive trend line in the medium to long term than currently anticipated under the SDS.

Until the depth and duration of the current crisis and government response are known, it will be difficult to predict the likely actions and routes that oil and gas companies will take towards recovery. However, it is already clear that this crisis heralds a period of significant transformation across the energy sector. Conditions are ripe for an accelerated energy transition. ING is closely monitoring the still uncertain developments and stands ready to support those clients who are preparing to seize the future opportunities.

Next steps

ING's upstream oil and gas finance business is characterised by the diversity of our clients: their geographical footprint ranges from global to local; their position in the value chain ranges from fully integrated across the upstream, midstream and downstream segments to pure-play oil and gas production; and their ownership varies from state to public to private. All of them are affected by the global energy transition and each can balance its management of transition risk with a positive contribution to climate action.

- **Significant and achievable reductions in GHG emissions are possible today**
  Fifteen percent of global energy related GHG emissions come from the process of getting oil and gas out of the ground and to consumers. A large part of these emissions can be brought down relatively easily.[31] According to the SDS, the single most important and cost-effective way to lower the GHG emissions

31 The Oil and Gas Industry in Energy Transitions, IEA, 2020.

intensity of delivered oil and gas is by reducing methane leaks, eliminating routine flaring and integrating renewables and low-carbon power into upstream field developments. This year has heralded the introduction of new market standards and certificates to reflect the value of this investment and to distinguish responsible, resilient and sustainable oil and gas production. We will continue to encourage and support these developments.

- **We will concentrate on the most responsible, resilient, sustainable production**
  The SDS shows that oil and gas production will still be required in the mid-century, albeit at steeply reduced levels compared with today. If investment in existing global oil and gas fields were to stop completely, the decline in output would be about 8% per year. This is larger than any plausible fall in global demand, and so investment in both existing and new fields will still be required.[32] As markets become increasingly competitive, ING will continue to support those companies that produce responsibly, to the highest environmental standards and with attention to reducing emissions.

- **Many oil and gas companies have the resources and experience to lead the way in developing and deploying new energy technologies and advanced low-carbon fuels**
  The deep pockets and large-scale engineering and project management capabilities of the larger oil and gas companies ideally position them to play a central role in enabling and bringing to scale some of the key capital-intensive clean energy opportunities, such as carbon capture, utilisation and storage (CCUS), low-carbon hydrogen, and energy storage solutions. Together with financial product and service specialists across ING, the energy sector's NETI team works with clients, policymakers and industry platforms to address finance issues relating to the commercial deployment of new energy technologies.

- **ING will steer its lending to upstream oil and gas as well as coal according to the Paris-aligned scenario trend as a minimum**
  As a part of our commitment to steering our lending portfolio towards the goals of Paris, ING has committed to reducing its oil and gas as well as coal financing at least at the same rate as the scenario production reduction rate. For coal, due to our strict policy, this rate will be much higher than the scenario proxy. This will be achieved either as a result of diversified clients shifting their businesses away from fossil fuel production – thus the allocation of financing to a clients' upstream business being reduced – or as a result of reducing our lending to the respective activities over time.[33] We will continue to transparently communicate our progress to achieve this goal on an annual basis.

32 The Oil and Gas Industry in Energy Transitions, IEA, 2020.
33 Credit Portfolio Alignment – An application of the PACTA methodology by Katowice Banks in partnership with 2DII.

Commercial real estate

- Our performance
- Our initiatives
- Sector outlook and challenges
- Next steps

Commercial real estate

Commercial real estate	
REF NL – Outstandings	€11 billion

Buildings, from skyscrapers to schools, to houses, consume roughly 36-40% of global energy and are responsible for about 40% of total direct and indirect CO_2 emissions.[34,35] The built environment, therefore, has a significant part to play in meeting the Paris Agreement goals. In particular, new buildings will need to be energy neutral if not energy-generating beyond 2025, while the majority of existing buildings will need to undergo vast renovations to significantly improve energy efficiency.

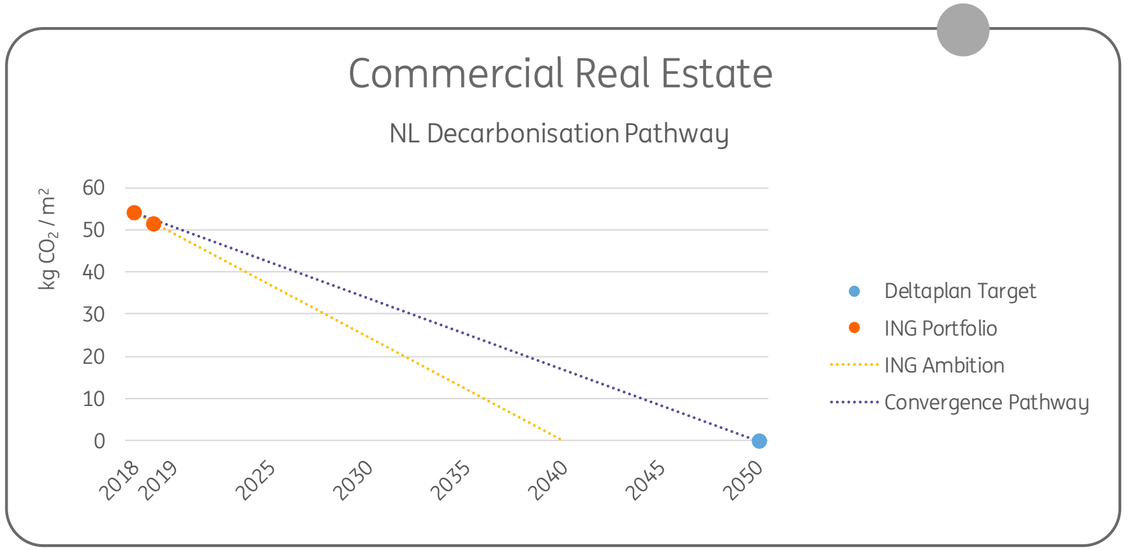
Because the existing building stock is the most important factor for meeting the Paris objectives, this is where we focus our efforts to support clients in improving existing buildings. For our Terra approach, we are now focusing on the Netherlands. Approximately 40% of our commercial real estate portfolio is currently in the Netherlands where data is the most accessible to us which makes this the best market to start with.[36]

34 https://www.worldgbc.org/sites/default/files/UNEP%20188_GABC_en%20%28web%29.pdf
35 https://www.iea.org/topics/energyefficiency/buildings/
36 The commercial real estate sector represents commercial buildings, such as schools, offices and car parks in the Netherlands only.

Our performance

The results below show the average CO_2 emissions intensity (kg CO_2/m^2) in 2019 and the decarbonisation pathway for ING's commercial real estate NL portfolio (hereinafter referred to as 'REF NL') to meet both its internal ambition and the Dutch climate target for buildings to achieve zero emissions by 2040 and 2050, respectively.[37,38] The Dutch climate target for buildings was established by the Dutch Green Buildings Council's Paris Proof Delta Plan Programme.

Figure 5 REF NL Decarbonisation Pathway



37 Terra has converted the average annual kWh/m² target set by the Delta Plan into a CO_2 intensity metric (Kg CO_2/m^2).
38 The results are based on approximately 60% coverage of the ING REF NL lending portfolio.

For 2019, we assessed 100% of the buildings compared to 60% for 2018. Our emissions intensity for the full portfolio in 2019 is 51.43 kg CO_2/m^2. With limited data on CO_2 intensity available for the current Dutch commercial real estate market, we are unable to make a direct comparison between ING's REF NL lending portfolio and the market. However, in relation to these emissions, 80% of the office buildings financed by REF NL are certified green buildings[39], compared to a market average of 34%.[40] Based on this, REF NL is currently outperforming the market. While there is more widespread data available on energy labels in the Netherlands compared to other countries, especially for our own portfolio, we still lack complete and up-to-date market data. This means that a market scenario pathway cannot be determined and we therefore cannot apply the red/amber/green (RAG) system to commercial real estate.

Our initiatives

ING managed to achieve our ambitious 2019 goal for the Dutch portfolio: 65% of the entire portfolio has a green energy label ('C' or better). This progress puts us well on track for achieving our future goals, though the last mile will be challenging. Our performance goals for the commercial real estate sector are:

- By year-end 2020: 90% of all office buildings have an energy label of A, B or C, in line with Dutch legislation in effect as from 2023 for office buildings (current ING performance: 81%).
- By year-end 2020: 67% of all other asset types have a (provisional) energy label of A, B or C (current ING performance: 56%).
- By 2023: 100% green energy label for commercial buildings.[41]
- By 2030: 50% completion of the kWh/m^2 Paris-proof goals per sector.[42]
- By 2040: achieve the Paris-proof objectives (10 years earlier than the Delta Plan target).

Our motivation to achieve these goals and the sense of urgency shared by our dedicated colleagues and clients are at their highest level in years.

In order to achieve these goals and be on track for aligning with the Paris-proof target, we have initiated various efforts with our colleagues and clients. The first step is providing our colleagues and clients with real-time and up-to-date sustainability data on the financed portfolios. Therefore, we integrated sustainability information into our ING client portal, so that it can be used as critical investment information for decision makers. Acknowledged by the EU for the sizable positive impact that our initiatives have had on the commercial real estate sector, we were granted an ELENA subsidy[43] to help our clients even further in their sustainable transition.

39 'Green buildings' are defined as having an EPC label of C or better according to Dutch regulatory standards.
40 https://www.rvo.nl/actueel/nieuws/energielabel-c-kantoren-%E2%80%93-stand-van-zaken-medio-2020
41 'Green energy label' means an EPC label of C or better according to Dutch regulatory standards.
42 Terra has converted the average annual kWh/m^2 target set by the Delta Plan into a CO_2 intensity metric (Kg CO_2/m^2).
43 ELENA provides technical assistance for energy efficiency and renewable energy investments targeting buildings and innovative urban transport. Typically, ELENA supports investment programmes above €30 million with a three-year implementation period for energy efficiency (residential projects included) and four-year period for urban transport and mobility. ELENA encourages and supports the aggregation of different projects to increase the attractiveness for contractors and financiers.

At a glance, the following are our most recent initiatives:

- Our REF Sun proposition supports clients in adding solar panels to their properties. We actively connect them to roof solar providers and help them apply for a subsidy. So far, 13 clients have been supported by ING.
- In order to overcome the split incentive dilemma[44], we initiated the 'sustainable valuation model'. This is now standardised for the Dutch market and will quantify the green premium as increased market value for a individual asset.
- Our Green Residential proposition provides clients with a plan of action to improve the energy performance of their residential portfolios.

In order to measure real impact and reduce energy waste, we introduced the energy robot in 2018. As of this year, we onboarded 30% of our non-residential portfolio into the energy robot system. Now we can track 10% of the energy consumption in these buildings. Given this growing number we are moving from indicated consumption data to actual consumption data, which will further improve our analysis going forward.

"We offer our clients smart tools that create awareness about energy waste in the real estate market. We're taking action by helping them with their Paris-proof portfolio roadmaps. It's important for the real estate market as a whole to find the appropriate methodology for reporting and have a benchmark towards the Paris Proof goals."

– Peter Göbel, head of Real Estate Finance – NL

44 The dilemma where commercial property owners cannot reap the financial benefits of investing in more efficient buildings as these are passed to the tenant who benefits from the lower energy bill. By quantifying the improved market value of the asset from improvements, financial benefits can also be used as an incentive for property owners.

Sector outlook and challenges

Impacts of the coronavirus crisis

At a macro level, the economy faces an unprecedented impact as a result of the Covid-19 pandemic. The commercial real estate sector, like many others, won't emerge unscathed. One of the most significant shifts has taken place among office buildings, as many remain largely empty with employees working from home. This is speculated to affect overall energy consumption and actual impact, being that largely empty buildings are still being powered, heated and/or cooled while only a fraction of the workforce is occupying them. However, we are also seeing a decrease in power demand as a result of lockdowns – though it's not certain yet in which parts of the built environment this is concentrated.

What is certain is that the pandemic has slowed construction in the built environment as a result of lockdowns and supply chain disruptions. This means fewer, newer and more energy efficient buildings are being built. However, the construction and materials sectors are believed to make a strong comeback as early as next year, should the virus be contained. It is yet to be seen, though, whether more widespread working from home will mean fewer office buildings in the future. This is a trend that ING will monitor.

The data challenge

The market for sustainability data in the built environment is relatively new and still growing, which makes it a challenge to find the right benchmark for comparing our financed real estate portfolio. We need to develop a methodology to overcome geographical differences in standards and regulations. It's currently difficult to find one market average on consumption across different building segments. Last year saw the onset of various initiatives stemming from the EU in collaboration with the real estate market. One is the Carbon Risk Real Estate Monitor (CRREM), which provides the real estate industry with transparent, science-based decarbonisation pathways aligned with the Paris climate goals. We'll investigate whether this represents the majority of the real estate market and whether we can use this as a benchmark for our portfolio. The EU taxonomy will accelerate the standardisation of environmental indicators. In the long term, the taxonomy will have a major impact on the sector because the green premium (the added asset value of a more efficient building) will become more evident. We will keep an eye on these developments and in the meantime, we'll maintain our commitment to align with the goals of the Paris-proof trajectory under the Delta Plan.

The Dutch government introduced a new measuring system called BENG (the Dutch abbreviation for 'nearly energy-neutral buildings). This very promising next step, whereby the energy performance of newly built buildings is given in kWh/m², will further add to the availability of accurate energy intensity data. This system will be in effect for new buildings as from January 2021.

In addition to providing transparency on our own performance, our focus for the Dutch portfolio is on providing clients with the insight needed to identify opportunities for improved energy efficiency and emissions reductions. We want to help them take action to realise these improvements through our large product and service offering. To achieve this, ING provides clients with digital tools, green financing, knowledge and connections to our sustainable partners.

Next steps

- Continue to engage with and offer clients sustainable solutions to improve their energy efficiency and climate impact.
- Extend our product range and partnerships.
- Add green assets to our green bond pool.
- Share our knowledge at real estate events.
- Share and expand our sustainability data set beyond the Netherlands.

Residential real estate

- Our performance
- Our initiatives
- Sector outlook and challenges
- Next steps

Residential real estate

Residential real estate	
Residential Real Estate NL, DE – Outstandings	€179.6 billion[45]

Almost half our loan book consists of residential mortgages, and houses generally account for about 22% of direct and indirect CO_2 emissions in the EU.[46] We're working with clients to improve the energy consumption of the houses we finance as a way of achieving our Paris alignment goals. Our long-term vision is to have an **energy-positive mortgage portfolio by 2050**. This means that the houses in our portfolio will collectively generate more energy than they consume.[47]

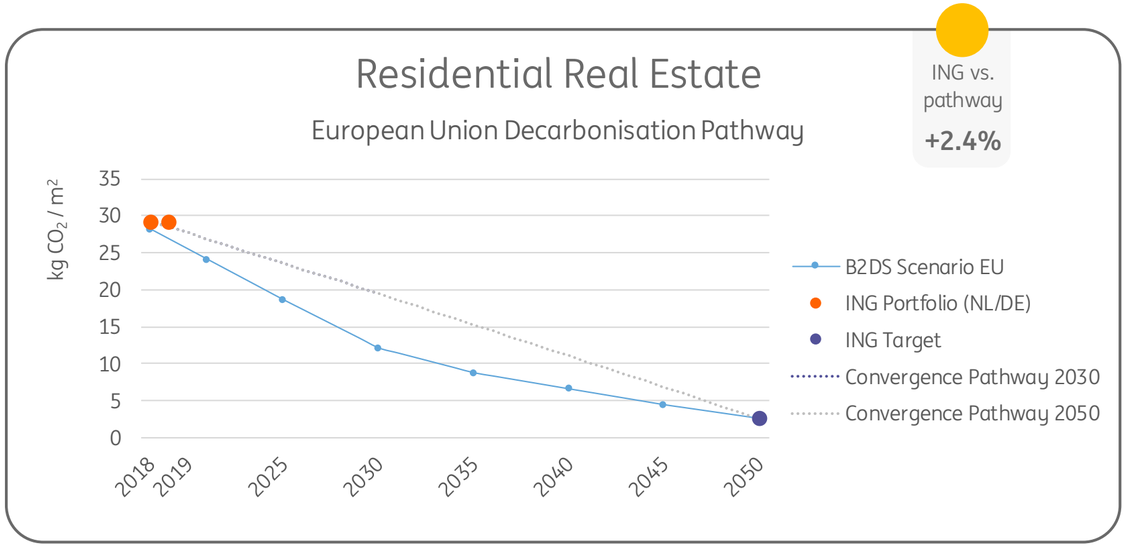
45 This figure excludes our Westland-Utrecht portfolio in the Netherlands.

46 Household carbon footprint in EU-27. Includes indirect impact from forestry and wood products, construction materials, electricity, fuels and waste. Direct household use of resources is also included. The data was compiled within the EU fp7 project GLAMURS based on the EE MRIO EXIOBASE v2.3 developed within the EU fp7 project CREEA and provided by https://environmentalfootprints.org/eu-regional.

47 This goal takes into account the increased market demand for renewables through clients' purchase of renewable electricity.

Our performance

Figure 6 Residential Real Estate Decarbonisation Pathway



Our current carbon intensity measurement covers our Dutch and German mortgage portfolio with a combined outstanding lending amount of roughly €180 billion (60% of total mortgage outstandings) and more than one million financed houses and apartments (hereafter referred to as homes).

In line with the recommendations of the Partnership for Carbon Accounting Financials (PCAF) for mortgages, we used energy labels as a proxy for the actual energy performance of the properties. Data on energy labels is publicly available in the Netherlands, for instance via the website of the Netherlands Enterprise Agency

(RVO). This energy label data is not publicly available in Germany. We have therefore developed our own means of determining energy labels in Germany based on other available data, such as building year, modernisation and subsidised loans via KfW.

A few updates have led to the recalibration of the German housing portfolio figure for 2018. This was due to new assumptions about the energy consumption in the different energy labels, a correction in the emissions factor and some smaller updated data. In conclusion, we now present a more precise evaluation and expect to develop our calculations as time goes by to obtain more precise and realistic information about our mortgage portfolio every year.

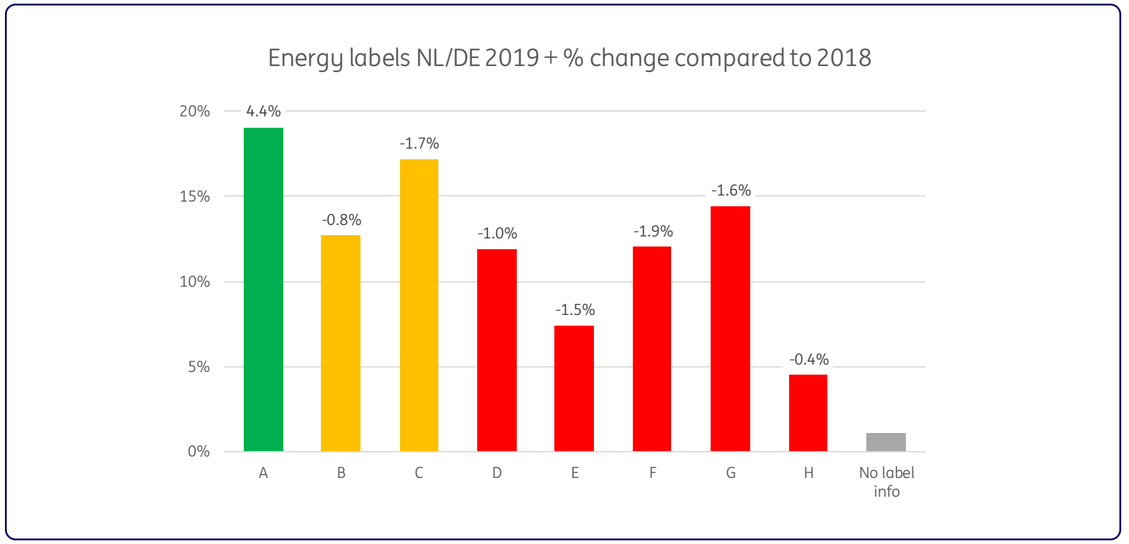
If we compare our 2019 performance with the pathway towards 2030 (more on this in the chapter 'Our pathway to 2050'), we are currently slightly above by 2.4%, warranting an amber status in our dashboard.

From focus on energy label upgrade to improving CO_2 intensity

When we started this journey about two years ago, we focused on upgrading the houses with D-G energy labels to a minimum of C. These measures are mostly focused on insulation (windows, roof, floor) and seen as 'no-regret' as they reduce energy consumption, therefore cutting monthly energy bills, and are mostly needed for whatever next step you'd like to take (e.g. changing the heating system). Our goal was to upgrade at least 50% of the D-G labels to a minimum of C by 2022. Although we still stand behind this approach, based on our measurable progress we must conclude that it's not very likely we will see this upgrade in our portfolio by 2022. This is due to a lack of accurate data to measure progress and a general lack of homeowner action. Let's dive a bit deeper into these reasons.

For our Dutch portfolio we have access to energy labels registrered at RVO. Figure 7 below shows how the labels changed in 2019 compared with 2018. Although it's great to see the increase in A labels and a decline in all other labels, this shift is not moving fast enough. We also question the accuracy of this data, which remains an issue in determining how well we're progressing towards our goal.

Figure 7 Energy distribution and progress of ING NL/DE portfolio



"We're happy to see an increase in energy efficient homes in our portfolio. However, we know we still have a huge transition ahead of us. This transition requires a systemic approach and we're happy to see governments stepping up their efforts to support homeowners. We as a bank also have a part to play. We do this by offering tools, services and financial solutions to our mortgage clients."

– Nick Jue, country manager of ING in Germany

One of the reasons to challenge the accuracy of the data is that there are hardly any incentives for homeowners to upgrade their energy label. Homeowners are obliged to have a final energy label when selling their home in the Netherlands. But this hasn't led to a major upgrade in the energy label database, as each year only a small percentage of the houses in our portfolio is sold. Nor does obtaining a correct or upgraded energy label seems very important to homeowners at present. In 2019, ING in the Netherlands offered a free energy label scan to our mortgage clients. The offer was online for all website visitors and proactively sent to approximately 100,000 homeowners in our database (segmented based on their current energy label). The offer wasn't just a free energy label scan but also a chance to win €10,000 to make upgrades. At the end of the campaign we ended up distributing not much more than 2,000 new energy labels. This shows how hard it is to get homeowners to review their current energy label and have it upgraded – even when it's offered for free and with a chance of winning an attractive incentive. One reason for this may be the cumbersome process, as it requires a substantial amount of data, which most homeowners don't have or have time to collect. This situation won't improve soon, as the rules on how to obtain a new or final energy label are expected to change (planning now is from 1 January 2021).[48] This will lead to substantially higher costs: a new energy label online now costs around €20 but, with the new process, will cost between €100 and €200. We expect this will lead to better scans and more accurate data, but also to fewer energy scans being performed overall. We therefore expect to see a very slow shift in our existing portfolio going forward.

48 More information on this can be found on the website of RVO: https://www.rvo.nl/onderwerpen/duurzaam-ondernemen/gebouwen/wetten-en-regels/bestaande-bouw/energielabel-woningen/nieuw-energielabel-woningen-vanaf-1-januari-2021

The second reason is that homeowners are not actively retrofitting their houses to become more energy efficient. Research done by Rabobank[49] confirms this. The study found that 40% of all Dutch homeowners hadn't taken any energy saving measures in the last five years. And research by Nibud[50] showed that 43% of homeowners aren't planning to take any measures in the coming five years. If we want more homeowners to take action, they need more than a financial nudge. Our view is that we need clear governmental policies – e.g. presented in a road map on how to move forward per country, per municipality and even on an individual property level. This will clear homeowners' doubts about whether their individual actions are in line with government expectations.

Based on the above, we've reached the following conclusions:

1. The speed of the transition of the residential real estate market depends heavily on governmental policies and actions – in other words, we need to align our convergence pathway with these plans;

2. It will be hard to measure a shift in our portfolio as long as we depend on the energy label as a proxy to measure energy consumption and CO_2 intensity per m^2. Therefore, we must strive to get as close as possible to the **real energy consumption of homes measured per m^2** (or CO_2 intensity) to obtain a better view of the current situation and the progress we're making over time.

The above findings and considerations have led us to the conclusion that we need to set our sights on CO_2 intensity instead of an energy label.

Our pathway to 2050

To determine where we need to be in 2030 (as an intermediate goal towards 2050) and taking into account what we see as achievable, we looked at the desired pathway of our portfolio – alignment with the beyond-2°C scenario for the EU – versus the planned pathway based on national governmental plans. For the Netherlands, we used the regional energy strategies (RES). For Germany, we looked at their Long-term Renovation Strategy (LTRS)[51] which was launched by the federal government to achieve the energy performance goals of the EU building directive, or EPBD. The reduction for the built environment was already laid out in the Climate Action Act (Klimatschutzgesetz) in December 2019: 70 million tonnes of CO_2 by 2030. To reach this goal, the LTRS foresees applying a combination of stimulation, support and information measures.

As the graphs show, the governmental approach and our intention to follow their pathways lead to separate speeds of transition for the Netherlands and Germany.[52]

49 More information on research: https://economie.rabobank.com/publicaties/2019/november/verduurzamen-van-huizen-loopt-stuk-op-misvattingen/
50 More information on research: https://www.nibud.nl/beroepsmatig/nibud-huiseigenaren-wachten-met-verduurzamen-op-overheid/
51 More information on LTRS: https://www.bmwi.de/Redaktion/DE/Textsammlungen/Energie/ltrs.html
52 Note: the emissions in the LTRS are for the entire built environment not just the residential market. We therefore used a correction factor as we estimate the transition for residential real estate only to be slightly less steep

Figure 8 Decarbonisation Pathway 2030 for the Netherlands

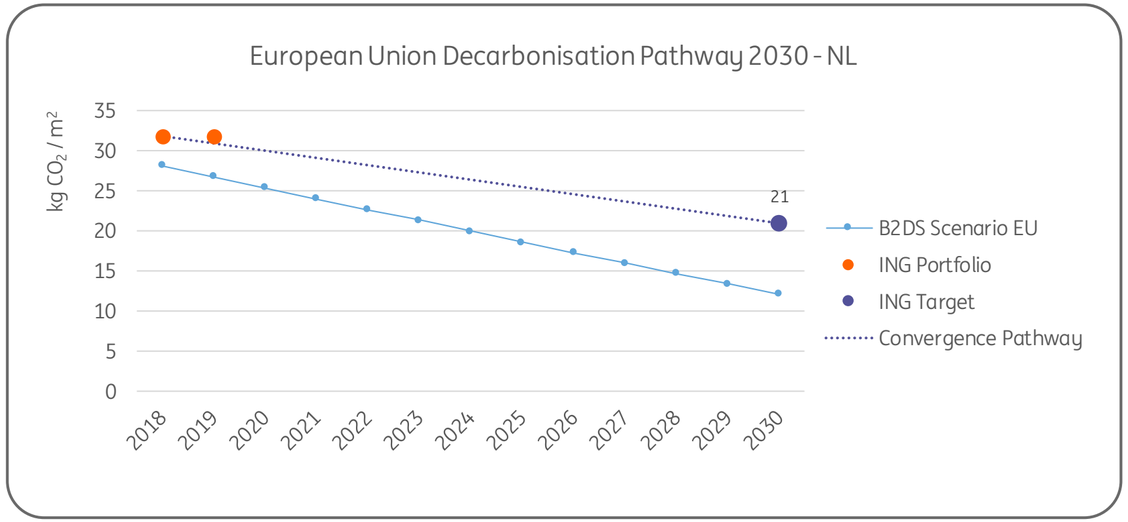
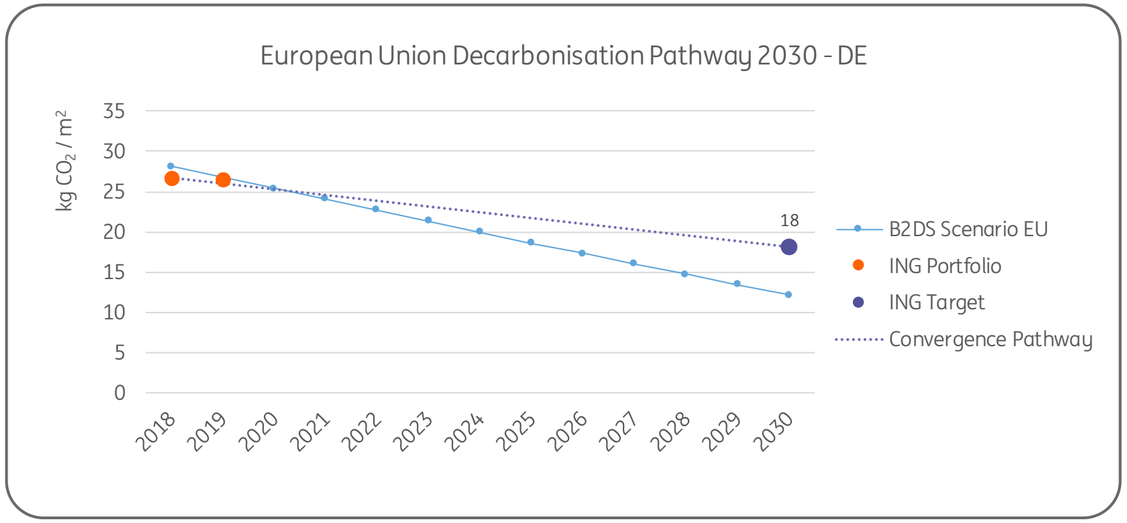


Figure 9 Decarbonisation Pathway 2030 for Germany



These plans were the main input to calculate our convergence pathway for both Germany and the Netherlands. We therefore also depend on the execution of these plans to reach our 2030 target. In addition, if these plans get delayed or speed up, we'll adjust our trajectory and target accordingly. As part of the LTRS, a dialogue process has also started (Roadmap Energieeffizienz 2050), which we intend to discuss during a round-table conference that we will organise in 2020.

For both countries, alignment with the B2DS Scenario for the EU would require a faster transition. For the German portfolio, we expect our CO_2 intensity to be higher than B2DS as from 2020, as the levels set out in this scenario are decreasing faster than our current performance. And for the Dutch portfolio, we're already above the scenario. As mentioned above, we use governmental plans as the basis for our convergence pathway. With our role in the transition – offering financial and other instruments to homeowners, creating awareness about this topic, etc. – we feel the best we can do is to support these governmental plans and align with that pathway.

Expanding our scope

Belgium

In our Belgian market, we work together with other banks via Febelfin, the Belgian financial sector federation. We have been discussing with Belgium's three regional governments how to gain access to the energy labels of the homes that we finance. We also see a push coming from the Belgian Central Bank. They would like banks to integrate the energy performance certificate (or energy label) information as part of their regulatory reporting on disclosures of their mortgage portfolio. ING in Belgium created an internet page with all the necessary information for homeowners who would like more information about why and how to make their home more energy efficient. This content has been and will be used in our newsletters and campaigns to increase client awareness.

Poland

We have made our first attempt to calculate the CO_2 intensity of the Polish mortgage portfolio. Our starting point is the year of construction and the average energy consumption in kWh/m² per year per period (e.g. 1920-1945; 1945-1970). This mapping was done with the help of external consultant Drees & Sommer. Based on this information, the average energy consumption of the homes that ING financed in 2019 was 158 kWh/m² a year. This is more or less the same as the energy consumption in the Netherlands (152 kWh/m² a year). We then used the energy mix for Poland's homes to calculate the kg CO_2/kWh. This is where we start to see big differences compared with other markets, as this is 0.385 kg CO_2/kWh. That means the CO_2 intensity metric for this portfolio is 61 kg CO_2/m² a year. Although this is quite positive compared to the national Polish emission intensity of 81 kg CO_2/m² a year, it's roughly twice as high as the NL/DE CO_2 intensity metric. We will work together with our Polish colleagues to better understand the governmental plans to lower these emissions (e.g. through changes in the energy mix and increases in newly built homes). This will help us to decide how this part of our portfolio would fit in our beyond 2°C scenario for the EU or if it deserves an alternative pathway. Meanwhile, we've taken our own responsibility by introducing a green mortgage to support homeowners in Poland who are willing to invest in an eco-friendly home that does't exceed 40 kWh/m² a year.

Our initiatives

We are working to raise awareness about this topic with our clients and to offer products and services to make it easier and more accessible for them. These offerings are summarised on our website.[53] In addition, our website shows different ways to finance green improvements.[54] Next to ING's finance propositions, the Dutch government provides attractive loans (low interest rate and duration) via the National Heating Fund (Warmtefonds). These loans were introduced in early-2020 by the Dutch government for every homeowner. Considering the attractiveness of these loans, we don't see a big market for our green consumer loans to grow. A similar situation is applicable in the German market where the 'KfW mortgage' has provided loans since 2005 to nearly six million properties to increase their energy efficiency. ING has been offering KfW mortgages for many years.

53 https://www.ing.nl/particulier/hypotheken/duurzaam-wonen/index.html
54 https://www.ing.nl/particulier/hypotheken/duurzaam-wonen/financieren.html

Sector outlook and challenges

Collaboration in the sector

Together with other PCAF banks in the Netherlands we made our first attempt to improve the data we have available on a portfolio level. Statistics Netherlands (CBS) provided the participating banks with 2016 data on real energy consumption and joint CO_2 emissions for their total mortgage portfolio. The results were published by CBS in May 2020[55]. Although this is a good attempt to improve the quality of the data, there are also a few limitations. The data is from 2016, while we would prefer more recent data as portfolios shift every year. Moreover, aggregated data on a portfolio level doesn't allow us to steer on an individual client level. We look forward to continuing these collaborative attempts to get access to better data.

Regulatory developments

The European Commission is preparing a 'renovation wave' initiative as part of the EU's Green Deal. This will help public and private buildings address the twin challenge of energy efficiency and affordability. Consultation started in June 2020[56].
The Regional Energy Strategy (RES) in the Netherlands (plans per region on how governmental bodies will help homeowners to change their current gas heating to other heating systems, such as district heating or heat pumps) has been postponed by four months due to the coronavirus.

Impacts of the coronavirus crisis

It remains to be seen what the exact impact of Covid-19 will be on the energy transition for the built environment. There are several driving forces that act against each other. On the one hand: jobs and income are uncertain and overall client trust among homeowners could lead to postponement of retrofitting actions (confirmed by research done by Vereniging Eigen Huis, a Dutch homeowners' association, in 2020). In addition, people may prefer not to have workers in their homes during lockdown, as it's hard to maintain social distancing. At the same time, working from home may give people new ideas about the need to create a comfortable, healthy and safe place to live and work. Being at home can also increase energy consumption and make people more interested in lowering their monthly energy bill.

The connection between consumer trust and action – or inaction – to take steps as a homeowner towards a home efficiency retrofit seems logical. Another interesting connection is that strong governmental policy could strike a balance between consumer trust and taking that action – to create jobs, no less. This view was confirmed by recently published research and position papers from experts, such as Hepburn et al. (2020) and McKinsey. We agree with this view as argued in our Build Back Better statement[57] as we see this as a great way to create jobs and help the climate at the same time.

55 https://www.cbs.nl/nl-nl/longread/diversen/2020/inzicht-in-co2-uitstoot-van-particuliere-hypotheekportefeuilles?onepage=true
56 More information: https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12376-Commission-Communication-Renovation-wave-initiative-for-the-building-sector
57 https://www.ing.com/Newsroom/News/How-ING-can-help-build-back-better.htm

Next steps

Future sector strategy at ING:

- Continue with empowering homeowners to upgrade the energy efficiency of their homes by:
  - Creating awareness about this topic, such as with information on our website.
  - Providing homeowners with financial solutions, such as green mortgages, and renovation loans.
- Empowering governments and other organisations to create large-scale solutions, such as by providing sustainability improvement loans and/or green bonds.

As we cannot achieve or even come close to these goals as ING alone, and as we depend on the measures taken by the government, we will continue to:

- Advocate for stronger policy on minimum standards for energy efficiency for residential buildings (e.g. similar to commercial real estate in the Netherlands with at least a C label for office buildings by 2023).
- Collaborate with peers to obtain a better understanding of the impact of energy efficiency on homeowners and mortgages (e.g. by analysing the correlation between risk and energy efficiency through the EEFIG working group on risk assessment).

Cement

- Our performance
- Our initiatives
- Sector outlook and challenges
- Next steps

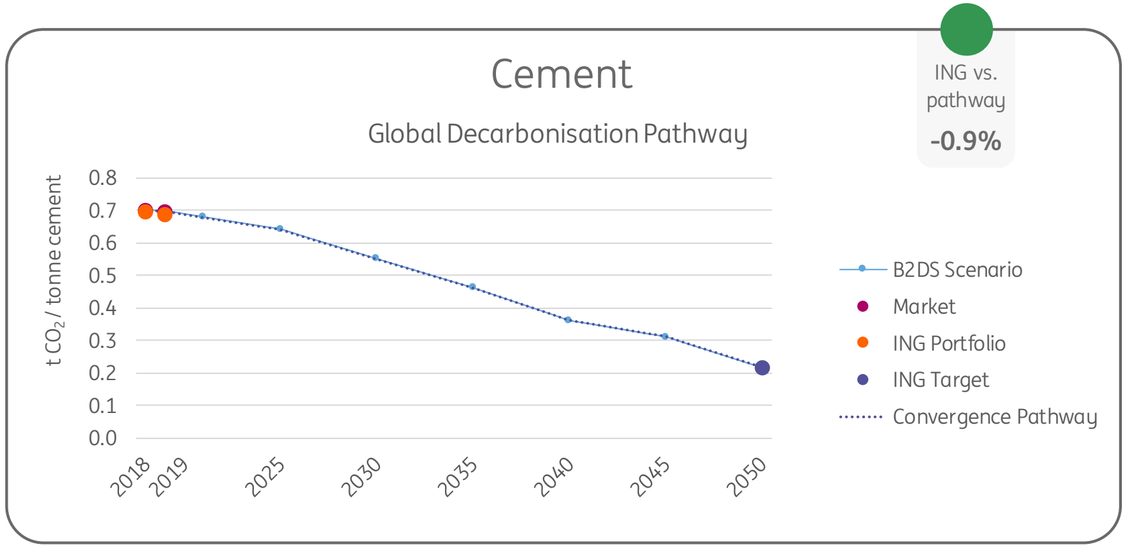
Cement

Cement	
Outstandings in scope	€625 million

Each year, more than four billion tons of cement are produced, accounting for around 8% of global CO_2 emissions.[58] It is the most commonly used man-made material on the planet and the second-most consumed element in existence, second only to water. Over half of the CO_2 emissions from cement manufacturing arise from the heating of limestone in a kiln to produce clinker, a component of cement, which releases CO_2 as a byproduct. A further 40% of cement emissions comes from burning fossil fuels to heat kilns to high temperatures, followed by another 10% related to fuel needed for mining and to the transport of raw materials.

Our performance

Figure 10 Cement Decarbonisation Pathway



The analysis of ING's cement portfolio focuses on cement producers, as they are the primary drivers of emissions in the sector. The 2019 results for cement show a slight decrease in CO_2 intensity year-on-year, now standing at 0.9% below the convergence pathway and on track to meet the long-term target to align with the B2DS scenario in 2050 by reducing emissions intensity by about 69% compared with 2018.

58 https://www.chathamhouse.org/sites/default/files/publications/2018-06-13-making-concrete-change-cement-lehne-preston-final.pdf

"We decided this year to group our heavy building materials activities and other construction-related activities into a newly formed Construction sector. This will help focus our priorities as we move ahead. Sustainability is a differentiating factor within construction. As far as cement is concerned, we're closely monitoring the decarbonisation pathway. We're focusing on developing and maintaining client relationships in order to help ING's portfolio accelerate the energy transition."

– Michele Monterosso – global lead of Construction

Our initiatives

Through ING's sustainability products, ESG policies and our Terra approach, we maintain our commitment to working with clients to help them achieve their sustainability ambitions. We have been continuing our work to develop client engagement tools, including the Terra dashboards.

Our client-level insights provide clients with a better understanding of their current and planned climate strategies. Clients are then able to identify opportunities through our financing solutions.

Furthermore, in 2020, ING made the decision to establish a dedicated construction sector within our organization. The newly formed sector will work on stregthning governance by optmizing management of our cement portfolio and effectivly steering it towards new opportunities, while ensuring we remain a relevant stakeholder and faciliator in discussions on technological developments/trends as well as regulatory developments concerning the sector.

Sector outlook and challenges

Reducing CO_2 emissions in the cement industry is challenging primarily due to the relatively few alternative technologies readily available at scale and the limited economic incentives to reduce emissions in the absence of sufficient global carbon pricing signals. At the same time, cement manufacturing has a strong correlation with economic growth as a result of its unique role in construction. Therefore, decarbonising the sector while producing enough cement to meet demand is critical for a smooth transition.

Decarbonisation in cement manufacturing has been over-reliant on negative emissions technologies such as carbon capture and storage (CCS), which have so far failed to scale. This is set to change with the current advances in the Oxyfuel technology, which allows CO_2 to be captured in highly concentrated form before it reaches the atmosphere and make it usable as a raw material for making chemichal products. Energy efficiency improvements and increasing usage of sustainable fuels have also proved to be very important though insufficient for the level of disruption required for climate alignment.

A major breakthrough in the development of low-clinker and novel cements is urgently required for the rapid decarbonisation needed for Paris alignment. Given the nature of the cement industry, to get the next generation of low-carbon technologies to the market, a considerable push from regulations and incentives to promote innovation will be needed.[59]

Technological developments/trends

Historically, there have been low expectations for the emergence of disruptive technologies in cement manufacturing due to the massive investment requirements for setting up or adapting cement plants. This, combined with a cautious reputation attributed to the few large producers when it comes to challenging their existing business model with new products, has kept such expectations low.[60] Evidence of this is that R&D has and is extepected to continue to focus on the deployment and scaling up of currently available technologies focused on clinker content reduction in cement over the short term.[61] Limited by the lack of demand from cement manufactureres, banks encounter very few opportunities to support transition in the cement sector, as clients continue to focus on traditional financing in the absence of a tangible cost advantage from an ESG link.

In the longer term, a robust regulatory framework that provides clear market signals and targets is largely regarded as an important driver for identifying and developing the next generation of technologies. This, however, is currently expected to unfold around and beyond 2030, undermining climate alignment prospects in the sector to meet the mid-century targets. As a likely catalyst for change, we notice rising pressure from the investor side, starting with equity investors and now spreading slowly over to debt investors.

Another long-term prospect for the sector is the deployment of the Oxyfuel technology, which has been identified as a potential cost-effective carbon capture technology solution expected to became scalable around 2030.

Regulatory developments

Emissions-related regulations targeting the cement industry have been slow to develop, largely as a result of the intrinsic complexities of decarbonising the sector. This has been flagged by think tanks and industry observers as a major impediment for change. In the past, the mere anticipation of regulatory strengthening has been capable of driving up innovation in cement. In a 2018 report, Chatham House, a UK-based think tank, speaks of the expectations that a Copenhagen summit deal and a further tightening of the EU ETS (Emissions Trading System) will lead to a surge in innovation research and in industry efforts such as the Cement Sustainability

59 https://www.iea.org/reports/cement
60 https://www.chathamhouse.org/sites/default/files/publications/2018-06-13-making-concrete-change-cement-lehne-preston-final.pdf
61 https://www.chathamhouse.org/sites/default/files/publications/2018-06-13-making-concrete-change-cement-lehne-preston-final.pdf

Initiative.[62] However, in the absence of clear regulatory signals, cement producers don't see immediate incentives to act.

On the international trade front, the world's largest economies, the US and China, in mid-2019 set high import duties on several of each other's goods, including cement. Generally, so far, the sector hasn't been directly affected in significant ways, with cement players feeling the impacts primarily in the form of a displacement of supply from importers to domestic suppliers. If the steel and aluminum industries, also subject to higher tariffs, prove to be less resilient, the construction sector could be affected and this, in turn, can have a relevant adverse impact on cement. Ultimately, in light of the Covid-19 pandemic, both countries have started to grant exemptions to the tariffs, and it remains to be seen how things will play out over the coming months.

Impacts of the coronavirus crisis

The two largest industry players, LafargeHolcim and HeidelbergCement, both saw a decline in sales in the first half of 2020. Although this is far from the scale of decline seen in other heavy industries, the longer-term effects of the economic crisis ensuing from the coronavirus pandemic on demand for the sector cannot be undersestimated. This follows a year of already slower demand growth driven by the economic slowdown in China, which represents more than 50% of world cement demand. Recovery is only expected as the broader economy resumes growth. While this may result in immediately positive results from an emissions perspective, as the sector struggles with loss of revenue, fewer funds can be expected to be directed to much-needed innovation in the sector.

Losses from the declining demand and corresponding fall in cement prices are expected to be somewhat offset by a decline in fuel and logistics costs. The cyclical characteristic of the cement industry indicate that recovery of the sector is going to take place as the wider global economy recovers. Domestic demand tends to play a considerable role for cement producers. Therefore, the ability of individual countries to manage the health and economic crisis in the coming years will likely contribute significantly to the individual outcomes of firms.

Next steps

- Continous development of the recently established construction sector. Now with a global lead overseeing the entire value chain, including heavy building materials and the cement industry, a strategic focus is placed on sustainability and steering our portfolio towards new opportunities in technological advances and actively engaging in discussions with industry peers and clients as well as staying on top of regulatory developments.
- As clients' apetites develop and strategies shift, ING will support cement sector clients' ambitions in technological developments and decarbonisation by providing funding and advising on green financing solutions.
- ING will work with peers and other stakeholders to further improve and test effective strategies, products and approaches for facilitating progress in this sector.
- We will update our progress in the sector annually.

62 https://www.chathamhouse.org/sites/default/files/publications/2018-06-13-making-concrete-change-cement-lehne-preston-final.pdf

Steel

- Our performance
- Our initiatives
- Sector outlook and challenges
- Next steps

Steel

Steel	
Outstandings in scope	€2.8 billion

Steel is an essential part of the fabric of modern life. It is used in the production of much of what surrounds our everyday lives, such as vehicles, white goods (including refrigerators, air conditioners and stoves) and buildings. In Europe, it is an integral part of manufacturing industries. However, due to its prominent use and the nature of current production methods, the steel sector is responsible for about 7% of global emissions. While emissions per tonne of steel have fallen over the past 50 years, the production of one tonne of steel will, on average, emit about 1.8 tonnes of CO_2.[63]

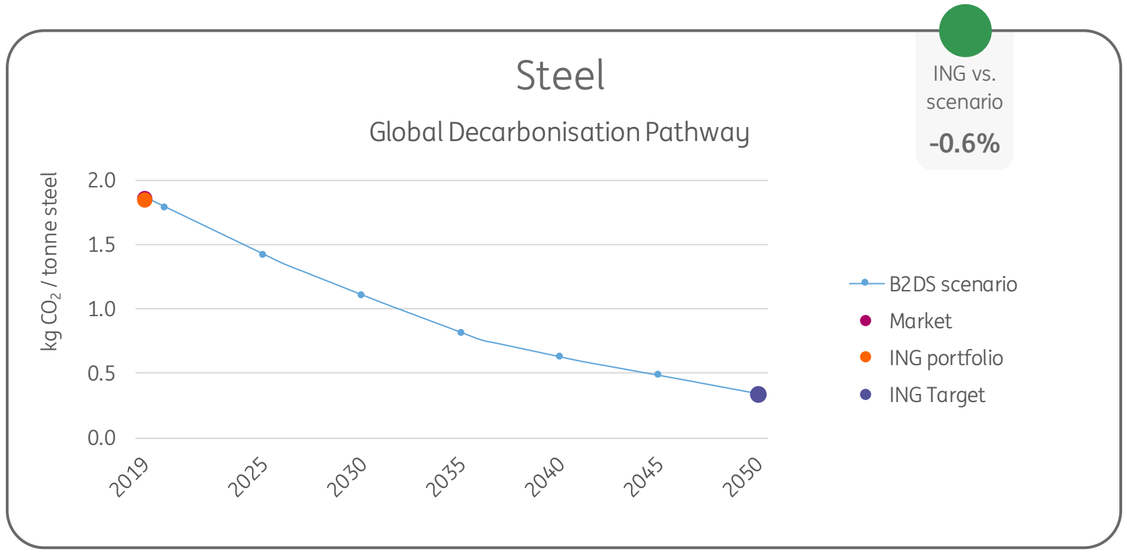
Our performance

2019 is the first year for which quantitative Terra analytics were available for ING's steel sector. These analytics have provided us with important insights into the current state of our portfolio regarding climate alignment as well as where we are heading. Obtaining reliable and consistent industry-wide data from an independent supplier remains a challenge for the sector and to this end, together with the Katowice Banks and 2DII, we have taken the initiative to seek out the data that is needed from several data providers. As a result of these concerted efforts, we hope to see an improvement in data quality and granularity in the coming years, which will in turn foster transparency and encourage climate-related reporting in the industry.

For now, we have applied the PACTA approach using the latest 'PLANTFACTS' dataset from Stahl, a steel data provider. This dataset provides us with an initial assessment of the estimated portfolio emissions intensity compared with the climate scenario. We will continue to work with 2DII, the Katowice Banks and data providers to further refine the results and provide an update with previous year restatements, if necessary, next year. In the meantime, the current methodology provides us with an indication of our portfolio performance compared with the market and the climate scenario. This, combined with in-depth sector expertise and strong client relationships, will allow us to make choices to steer our portfolio in the right direction.

63 World Steel Association

Figure 11 Steel Decarbonisation Pathway



ING's portfolio is outperforming the market at the moment, and thus the starting point of the scenario, by 0.6%, putting us slightly ahead of the global B2DS scenario in 2019. With a current carbon intensity of 1.856 kg CO_2/tonne of steel, in order to align with the global B2DS scenario in 2050, we need to reduce intensity by 82%. We have not yet defined our convergence pathway for the steel sector as we expect that the decrease in average market (and ING's steel portfolio) intensity will be slow and will not significantly change before 2030. As such, both the market and ING's portfolio lines will likely deviate significantly from the B2DS scenario as shown in Figure 11. The remainder of this chapter will set out the reasons for this.

Our initiatives

Beyond the work we have been undertaking with 2DII and the Katowice Banks for the last six months as part of the PACTA pilot, we have also increasingly steered our strategic dialogue with clients towards sustainability performance. While several initiatives are currently ongoing, it will still take a significant amount of time to reduce carbon emissions substantially, as alternative technologies are not yet technically or economically viable. Accordingly, at this point, client engagement focuses on climate target-setting for the next five to ten years and on discussing dilemmas and ambitions for carbon reduction to understand how ING can best facilitate our clients' transition through our banking products.

Sector outlook and challenges

The steel sector broadly requires three things to achieve the energy transition:

1. availability and affordability of technology,
2. availability of raw materials, and
3. public incentives.

While the theoretical pathway to carbon-free steel is more or less clear, achieving it in an economical manner will be a significant challenge. As such, technologies such as the direct reduction of iron ore using hydrogen, carbon capturing and utilisation as well as hydrogen production, will have to be developed further in the coming years.

Currently, around 70% of global steel production takes the 'blast furnace route', where iron ore is reduced using coking coal. The remaining 30% is produced by melting scrap (steel recycling) in an Electric Arc Furnace (EAF), which is relatively clean as

it is electricity-based. An increase of scrap-based steel production, however, would require a similar increase in the supply of scrap, which may not be sufficient to fuel demand growth. In addition, producing high-quality (i.e. auto grade) steel from scrap is very challenging. Therefore, while we do expect an increase in scrap-based steelmaking, currently the most likely candidate for low-carbon production of steel is the aforementioned green hydrogen-based reduction of iron ore (H2-HBI). This can subsequently be processed into steel in an EAF. If green hydrogen is used, this will lead to (almost) carbon free steel making. However, a complete capital-intensive hydrogen infrastructure will have to be built to allow the steel industry to move to this reduction process as there is no (clean) hydrogen supply available at this point in time.

Finally, given the investments required to transform this capital-intensive industry, where carbon-free steel is likely to be more expensive than conventional steel even given the technological advances, strong public and governmental support, funding and financial incentives will be required to make this work and support the sector's full transition.

Europe is the most vocal in its desire to support the steel sector's transition with the EU's Green Deal and this is where most of the global pilot projects and research are being carried out. However, Europe represents only about 10% of global production. In contrast, while there is less focus on sustainability, the US as a whole is currently the "greenest" steel producer due to the prevalence of the EAF method. As mentioned above, there is a long and complex journey to low-carbon steel, and we do not expect to see a significant reduction in emissions on an industry-wide scale over the next 15 years. We further illustrate the opportunities and complexities below.

"Steel is essential for modern life, and yet also a market where the transition to low-carbon production methods will be a significant challenge both from a capital and technology standpoint.

We believe this will take time, but are committed to support our clients to drive this necessary transition."

– Arnout van Heukelem, global head of Metals & Mining

The transition for the steel sector

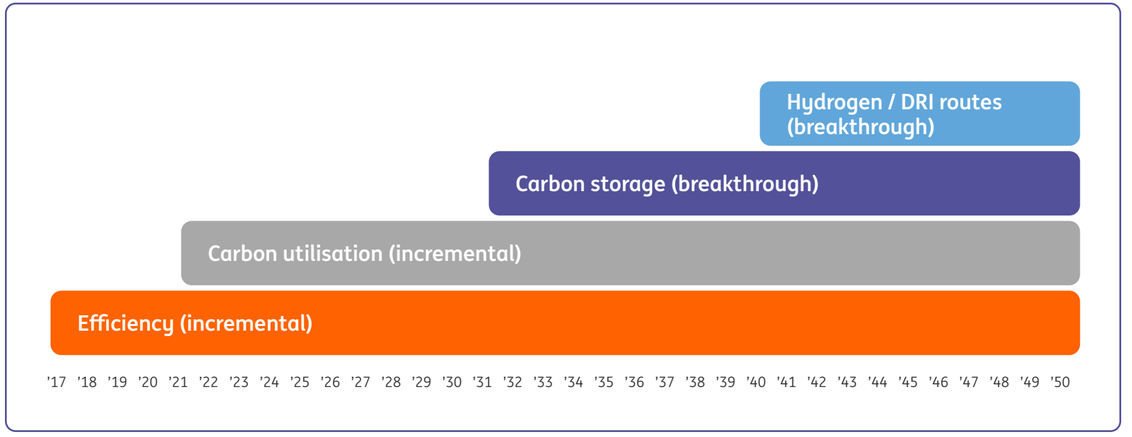
There are roughly three routes for reducing CO_2 output of the steel industry:

1. **Increase energy efficiency of blast furnaces (BFs):** The most efficient BFs currently emit around 1.8-1.9t of CO_2 per tonne of steel, while the achievable lower limit of CO_2 emissions of the BF process is estimated to be around 1.5t CO_2. Therefore, it is expected that a further reduction of around 15-20% of CO_2 emissions might be feasible through incremental improvements. Please also note that for the BFs that currently emit more than 2.0t of CO_2, reductions are feasible using technologies already widely available (for instance, pulverised coal injections). We expect these small improvement steps to continue over the next 25 to 30 years (potentially made economical by carbon pricing).

2. **Capturing and storing/or using CO_2 output:** The second transition route envisions either carbon utilisation (i.e. conversion of carbon to chemicals) or a combination of storage and utilisation. While carbon utilisation is considered an incremental step (although a challenging one), the large-scale storage of CO_2 would be a breakthrough technology. Please note that some innovative steelmaking techniques, such as Hosanna, also have as a primary benefit that the CO_2 emitted is of a higher purity and therefore easier to capture and store. Disadvantages of capture and storage include the costs as well as the limited percentage of CO_2 that can effectively be captured from an industrial site (no more than 90%) as well as potential public unease about underground storage and the associated risks.

3. **Replacing carbon as a reducing agent:** Finally, the ultimate goal would be to replace carbon (i.e. coking coal or natural gas) as a reducing agent. Effectively, this is likely to lead to a shift to the EAF route, first reducing iron ore using hydrogen to produce HBI/DRI as a raw material for conversion in a renewable energy powered EAF. In Europe, the steel company SSAB, together with iron ore producer LKAB and energy producer Vattenfall, are planning to produce the first zero-carbon steel by 2025 in a demonstration plant. The benefits of this route are that HBI-based steelmaking is already being used on an industrial scale and the process is quite like the current gas-based process. There are concerns whether sufficient HBI could be produced to supply the full steel sector due to iron ore quality constraints, and in any case significant investments into iron ore processing would have to be made to facilitate this as well.

Figure 12 Transition timelines per strategy and technology



Considering long investment cycles in the capital-intensive steel industry, we expect to see a slow implementation and roll-out of the various solutions over the next 30 years. It seems likely that most steel companies will apply a mix of the various routes over the coming years, as all of them carry uncertainties, and that large-scale commercial production will not commence until the mid-2030s. Besides the fact that design and testing will take time, significant investments in R&D, technology and the electricity grid will also be required. Moreover, in order to have a meaningful overall emission reduction, the electricity supplied (including the electricity to make the hydrogen) should also be produced by renewables.

Regulatory developments

Steel is a globally traded commodity. However, due to the physical weight of steel, trading generally has a more regional character. Further, the industry is characterised by high competition and low margins. The EU has clearly stated its strong ambitions with regards to CO_2 reduction, and if it imposes higher carbon costs on steel production while maintaining free trade with regions whose climate ambitions are lower, there is a real risk of 'carbon leakage' across borders.

The EU-based steel industry is already at somewhat of a disadvantage due to higher energy costs (versus for instance the Commonwealth of Independent States, US and China) and (to a lesser extent) higher labour costs compared with emerging economies like Ukraine and Turkey. In an industry where significant fluctuations in margins are a reality, this higher cost base theoretically limits investment capacity. While a more stringent climate policy will necessitate significant investments, it could also exacerbate the disadvantages and thereby limit the capacity for those investments. Introducing trade measures, such as a carbon border adjustment, could alleviate such pressures.

Impacts of the coronavirus crisis

While Covid-19 has contracted global demand for steel and plants were idled in geographies where the impact was immense, energy transition-related steel factors were not impacted. The technologies outlined above are mostly long-term projects that should not have been impacted, apart from what has been endured by global workforce and investment agendas. Instead, it may have prompted a rethink in the green strategy of steel players and, given the ongoing challenges in the sector, certainly more expensive and carbon-intense BFs that were idled during the lockdown may remain so.

Challenges and opportunities for the banking sector and ING

While it is clear that commercial banks will have a role to play in the energy transition for steel, the regulatory developments outlined above also clearly illustrate the challenges involved in financing the transition, especially in the early stages of technology development. Several public financing initiatives have been taken by the EU (such as the innovation fund) and the European Investment Bank. However, there are also examples of sponsored projects that never took off due to uncertain market conditions.

Despite the potential of breakthrough technologies outlined above, due to the technical challenges and lack of scale, these are not currently commercially feasible for bank financing on a standalone basis. We are certain, however, that the transition to low-carbon steelmaking will create fruitful opportunities in the long run. Once these technologies are bankable, players in the banking sector who have developed a better understanding of transitioning the steel industry will have the opportunity to make considerable investments. In the meantime, ING is poised and committed to developing the knowledge, capabilities and partnerships needed to support clients as this transition takes off in the years ahead.

Next steps

Given the scale of the challenge, ING considers the energy transition to be one of the major strategic issues currently facing the steel industry. To make further progress, ING will take the following next steps:

- Intensify outreach to industry bodies to obtain a greater understanding of the challenges and potential solutions.
- Continue to work with our partner 2DII and peer banks on refining the methodology and achieving better data accuracy for the steel sector.
- Develop a partnership with one of the industry-leading data providers to support a science-based method.
- Continue to engage with our clients on what steps they are taking and how ING as a bank can assist.

As outlined above, steel industry transitioning to low-carbon steelmaking will create significant opportunities for ING. Already committed to aligning its loan portfolio with Paris Agreement targets, ING is engaging with its clients on the strategic discussion of the energy transition. However, as the above outlines as well, significant challenges remain which will have to be tackled jointly by industry leaders and policymakers in order to facilitate the energy transition for the steel sector. ING is willing to contribute to these deliberations by industry leaders and policymakers and, in line with its commitment to Paris, will be ready to do its part.

Automotive

- Our performance
- Our initiatives
- Sector outlook and challenges
- Next steps

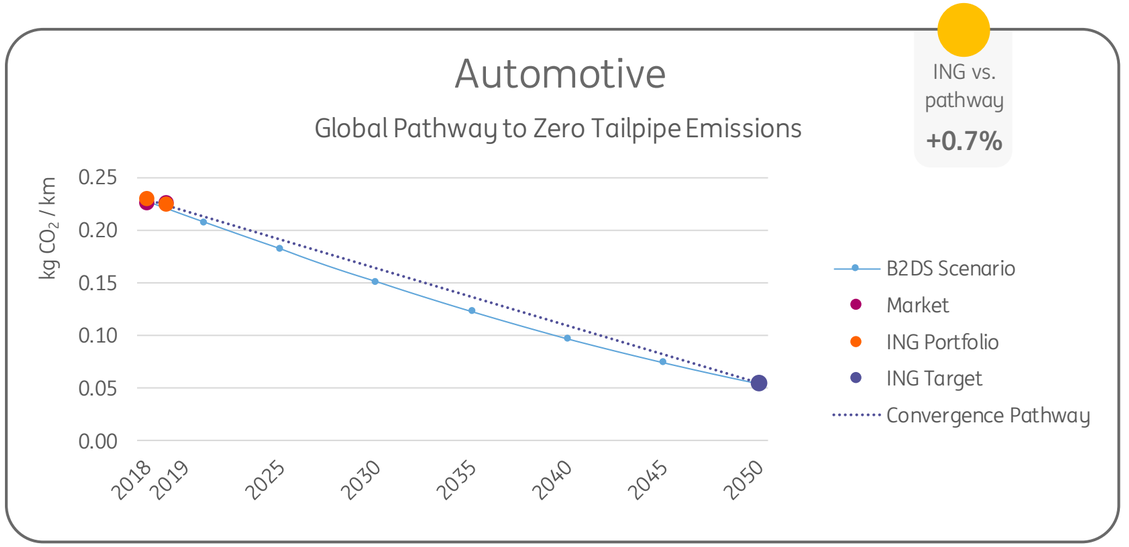
Automotive

Automotive	
Outstandings in scope	€2.6 billion

2019 marked another record year for electric vehicle sales worldwide, reaching 2.1 million electric passenger vehicles sold (including plug-in hybrid vehicles). This was a 40% increase compared with 2018 global sales. This growth rate has been achieved as a result of technological advancement, increased emissions-related regulation and an increased appetite among consumers for zero-emission vehicles.[64] Despite this growth rate and advancements in technology and policies, however, electric vehicles still only account for about 1% of the global car stock. As such, road transport still accounts for approximately 18.5% of global CO_2 emissions.[65]

Our performance

Figure 13 Automotive Pathway to Zero Tailpipe Emissions



The current production capacity within our automotive portfolio[66] reflects 94% internal combustion engines (ICE), with the remainder made up of hybrid and Battery Electric Vehicles (BEV).[67] Compared with last year, where 95% of our portfolio's production capacity was in ICE, we saw a slight relative shift from ICE to BEV and hybrid vehicles. Despite this improvement and a roughly 1% decrease in CO_2 intensity year-on-year, ING's automotive portfolio is 0.7% above the convergence pathway for 2019. This is in line with the expectation that in the short term, transition will be slower than the prescribed scenario pathway, with more rapid transition in the longer term. While we are converging more slowly than the convergence pathway, ING remains committed to

64 https://www.iea.org/reports/global-ev-outlook-2019
65 IEA: http://data.iea.org/payment/products/115-co2-emissions-from-fuel-combustion-2018-edition-coming-soon.aspx
66 The analysis of the automotive sector portfolio focuses on car and light-duty truck producers, known as OEMs (Original Equipment Manufacturers), as they are the primary influencers of emissions intensity. There are approximately 20 OEMs worldwide that generally have a global reach in terms of manufacturing and sales. Our portfolio includes most of these OEMs.
67 Fuel cell production is currently too small but may be revisited over time as and when it scales up.

steering towards its portfolio target to align with the B2DS scenario in 2050 by aiming to reduce emissions intensity by 76% compared with 2018.

Our initiatives

Over the last 12 months, at ING we have reassessed our client base of OEMs and automotive suppliers considering our commitment to the below 2°C goal. In our review, we identified clients that are progressing towards more zero-tailpipe emissions vehicles and are preparing their investments accordingly. While other economic and credit considerations have been factored into this review, our commitment to steering our portfolio was a key consideration. This review will help us to both engage with clients on their transition strategies and reshape our portfolio towards alignment in the months and years ahead. This will allow us to build resilience to crises, such as the pandemic and climate change.

In addition to engagement, we present clients with finance products to support sustainable projects. One example that will ultimately support the automotive sector's transition to zero (local) emissions vehicles is the financing of the IONITY joint venture between BMW, Daimler, Ford and Volkswagen Group (VW, Audi and Porsche). IONITY will provide a fast-charging network of 400 high-power EV chargers across Europe to help bolster the infrastructure needed for growth in the EV market.[68]

"Our green financing initiatives illustrate ING's support of the transition our automotive clients are taking up, which is also acknowledged by the leading global car manufacturers. Our recent green structuring and bookrunner role for the green bond for Volkswagen is a perfect example."

– Gerlach Jacobs, global head of Transportation & Logistics

68 https://www.ingwb.com/themes/sustainability/auto-sector-shifts-into-a-new-gear

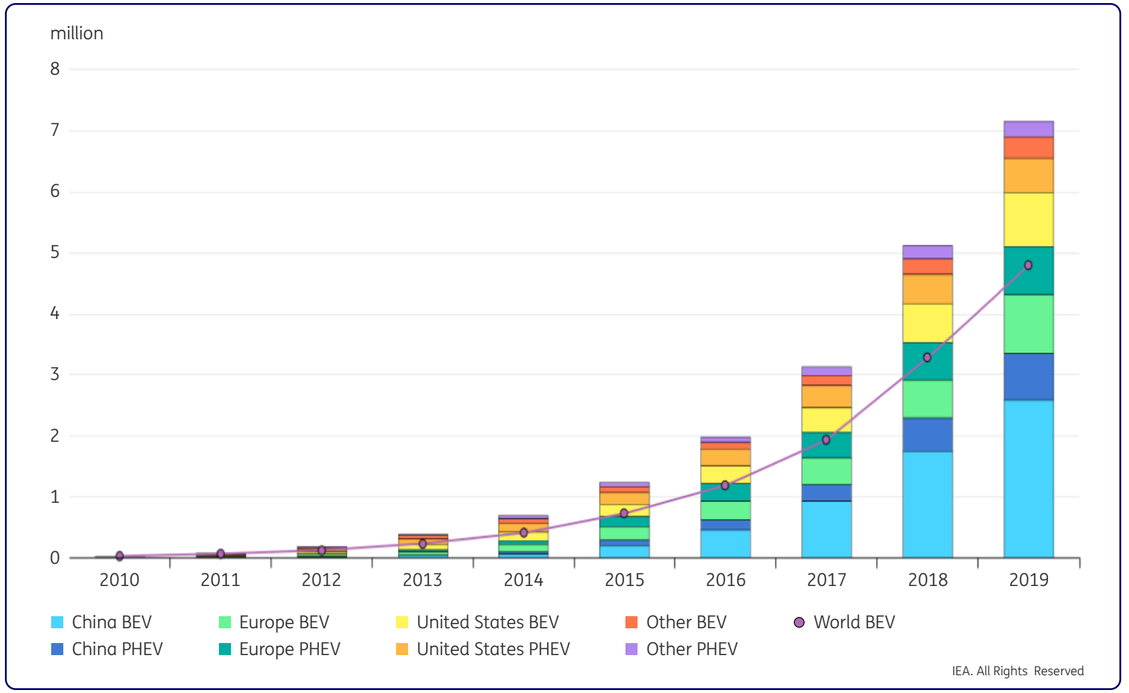
Another example of ING's support of the zero-tailpipe emissions transition is a recent transaction with Northvolt, a Swedish battery producer. ING co-leads the consortium providing Northvolt with a $1.6 billion boost to accelerate the electrification of transportation. You can read more about this green loan transaction here.

Sector outlook and challenges

As shown in figure 14, the last ten years have seen the global EV stock (including plug-in hybrids) rocket from just 17,000 vehicles in 2010 to roughly 7.2 million in 2019.[69] Manufacturers and suppliers are therefore shifting their R&D and production towards electrified powertrains in response to the energy transition – especially to BEVs. Other sustainable drivetrain and mobility options, including sharing platforms to increase the utilisation of cars, micro-mobility solutions (e.g. electric scooters, bikes, etc.) and the research into hydrogen and synthetic fuels as alternative energy carriers for cars and trucks, are also being explored. Most players in the industry are engaged in one, more or even all of the aforementioned R&D fields.

These positive developments are encouraging signs that the energy transition is gaining momentum in the sector. However, recent events surrounding the coronavirus pandemic could potentially slow growth of zero-emission vehicles, or present an occasion to propel the technology further with signs of recovery policies focusing on the support of efficient or zero-emission vehicles.

Figure 14 Global electric car stock 2010-2019, IEA



https://www.iea.org/data-and-statistics/charts/global-electric-car-stock-2010-2019

Impacts of the coronavirus crisis

The automotive industry is currently impacted by macroeconomic issues arising in its major markets (China, EU, USA). Global sales of passenger vehicles, which had already seen a decrease in sales in the past two years, are now widely impacted by Covid-19. It is expected that vehicle sales in 2020 will see a global decline of at least 22%,

69 https://www.iea.org/reports/global-ev-outlook-2020

a decline of about 20 million vehicles compared with the expected figure for the year.[70] As a result, all major OEMs were forced to halt production for some time during the pandemic.

Due to the critical role that the sector plays in several economies, it is expected that recovery packages will include support for the automotive industry. As the pandemic has impacted fuel prices, there could be an added dampening effect on EV sales in particular.[71] If we are to continue to see the rapid uptake of zero-emission vehicles needed to achieve the Paris Agreement, policies will need to include a specific focus on EVs in the recovery of the sector. If successful, the crisis could provide a new boost to the transition in the automotive sector.

Challenges and opportunities for the banking sector and ING

Declining revenues and additional pressure on margins are reflected by credit downgrades among clients, making it more difficult for banks to provide liquidity. Green opportunities are challenged by the low scale and the lack of profitability in the early phase of the transition. However, as the transition moves to scale and as regulations further support growth post-pandemic, capital demand for vehicles with zero tailpipe emissions is likely to grow. This will present ING and the banking sector with the opportunity to take part in providing the capital required to boost production, infrastructure and supply chains that will usher in the energy transition in this sector. To that end, ING will continue to monitor these trends, support clients whose strategies are focused on the transition and develop sustainable finance solutions for those who need our help.

70 MES Insights, June 2020.
71 IHS Markit, Coronavirus Impact on the Automotive Industry, 2020.

Next steps

ING's automotive team has been involved in many of the bank's sustainability initiatives, including the successful placement of sustainable finance products. Our sustainability strategy for the automotive portfolio includes the following three pillars:

- Continuing to align our client base in accordance with our goal to steer our portfolio towards the well-below 2°C goal.
- Encouraging sustainable products and aiming to create new products and services that support our clients' transition path while adding value.
- Establishing ING's thought leadership for sustainability in the automotive sector.

ING maintains a close working relationship with our automotive clients, valuing open, engaging discussions about sustainability and their own transitions.

- Utilising the client-level alignment dashboards, we will continue to discuss our clients' strategies towards zero tailpipe emissions in line with global goals.
- Our interim goal is to outperform the market in the short term, with the aim of seeing quicker convergence towards the B2DS portfolio target in the longer term.
- ING will also focus on financing other parts of the EV value chain to support the needed infrastructure growth, including charging stations and battery production in order to scale zero-emission vehicles.

Aviation

- Our performance
- Our initiatives
- Sector outlook and challenges
- Next steps

Aviation

Aviation	
Outstandings in scope	€3.4 billion

The aviation industry[72] makes up close to 3% of global CO_2 emissions[73], a figure that could grow to more than 25% by 2050 without concerted mitigation efforts, especially as other sectors decarbonise and because feasible, scalable low-carbon alternatives are lacking in the aviation sector. In recent decades, the aviation industry has seen continuous and persistent growth. Air traffic has more or less doubled every 15 years.

As such, absolute CO_2 emissions are approximately 70% above 2005 levels. Despite the wide-spread grounding of aircraft and near-halt of passenger air traffic as a result of the global coronavirus pandemic, underlying and long-term demand drivers (most prominently emerging markets and growing middle class) remain in place, and hence the propensity to fly (flights per capita per year) is still expected to increase dramatically in the years ahead. This is especially the expectation in emerging markets, with China and India currently still at <0.1 flights per capita per year vs. >2.5 in Europe and the US.[74]

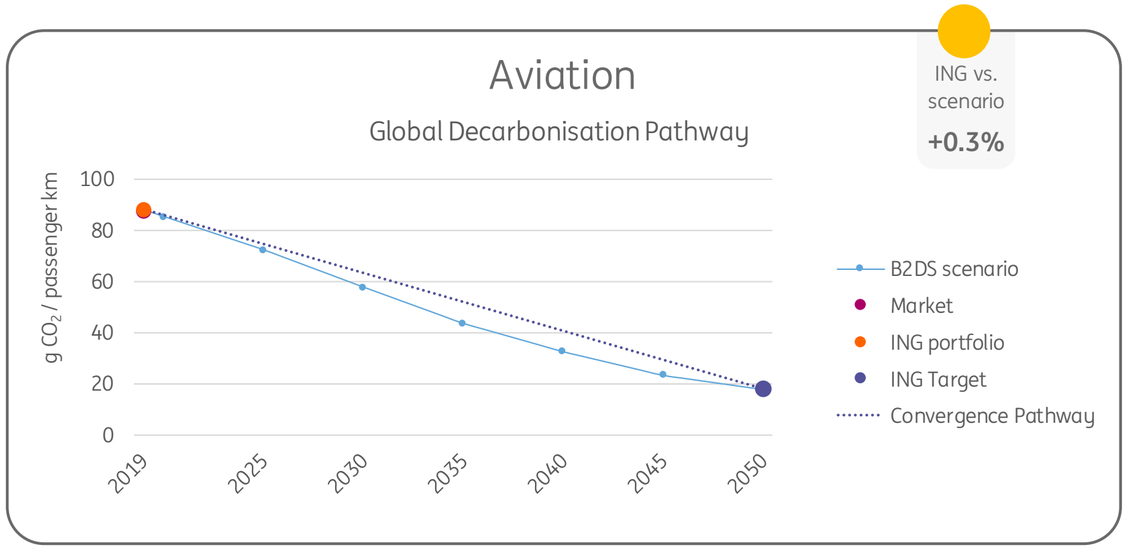
Our performance

ING's global aviation finance portfolio consolidates outstandings of roughly €3.4 billion and includes close to 460 aircraft with an average age of 4.9 years. The calculation of emission intensities is based on aircraft-specific information such as the aircraft's number of seats and flight data from 2019 (average distance per flight and daily frequencies). This is supplemented with the airline's load factor and publicly available fuel consumption data for different distance categories to arrive at CO_2 emissions per passenger-km per aircraft. This is subsequently weighted against the aircraft's outstandings to arrive at a weighted average CO_2 intensity for the portfolio.

ING's weighted average CO_2 intensity (88.2 g/RPK) is marginally above that of the global fleet's average (87.9 g/RPK) and therefore B2DS scenario's starting point. In order to reach the 2050 target of 18 grams of CO_2 per passenger-km in B2DS, the CO_2 intensity of ING's portfolio will need to decrease by almost 80%. Overall and in the short term, the aviation sector is expected to transition more slowly than the scenario prescribes, with a more rapid transition once scalable low-carbon fuel alternatives become economically feasible.

72 Despite the aviation sector's significance, it was not included in the Paris Agreement as a result of complexities in governing the industry. However, the International Air Transport Association (IATA), a global airline body that represents 82% of air traffic globally, has committed to reducing net aviation CO_2 emissions by 50% by 2050 relative to 2005 levels, which is to be achieved through improvements in technology, the adoption of sustainable fuels, more efficient aircraft operations, infrastructure improvements, and market measures to reduce emissions and to increase emissions offsetting.
73 https://www.carbonbrief.org/aviation-consume-quarter-carbon-budget
74 https://www.bloomberg.com/news/articles/2019-07-18/airlines-clash-over-co2-as-industry-vilified-in-climate-debate

Figure 15 Aviation Decarbonisation Pathway



Our initiatives

ING updated our Aviation Sector Strategy & Risk guidance paper in May 2019, in which specific financing parameters were included to differentiate between aircraft types and client profiles. ING looks favourably at latest-generation aircraft as these are typically up to 20% more fuel-efficient than their predecessors with a corresponding lower carbon footprint. As such, currently close to 25% of our loan book consists of these aircraft, with the goal of increasing this to at least 50% by the end of 2022.

With volatile oil prices and increasing societal pressure on carbon footprints, airlines have a clear incentive to adopt energy-efficient latest-generation aircraft and to explore the use of sustainable aviation fuels.[75] By having a relatively favourable financing approach towards the most fuel-efficient aircraft, ING can actively support its clients in this transition.

Furthermore, ING actively organises and participates in sector events such as ING's annual Aviation Day, the Sustainable Markets Initiative launched at the World Economic Forum in Davos and organised by His Royal Highness the Prince of Wales, and the Airfinance Journal meetings (e.g. in Hong Kong), where Hugo Kanters, our global Aviation Finance lead, was a keynote speaker on sustainability efforts.

Sector outlook and challenges

From an environmental perspective and in light of the industry's competitiveness, it remains challenging to regulate the aviation industry on an international basis. Furthermore, advances in technology, such as low-carbon, face long lead times in light of very high capital intensity and stringent safety requirements. In the absence of feasible and scalable alternatives and limited policy signals and incentives, the sector has limited options in its transition towards low-carbon technologies and practices. Short- to medium-term avenues to a more sustainable aviation industry could include influencing consumer behaviour and wide-scale adoption of biofuels. Furthermore, potential future increases in oil prices may accelerate declines in the values of older technology aircraft, in favour of newer, more efficient types, as well as reduce the profitability of airlines that operate older fleets.

However, the UN agency International Civil Aviation Organization (ICAO) is coordinating positive collective action to mitigate the harm done to the climate through its Carbon

75 Sustainable aviation fuels include lower-carbon biofuels such as biomass sourced from sustainable feedstock.

"As a global financial institution, ING is a participant in the real economy. We are committed to take our responsibility and contribute to the objective of the aviation sector to reduce its carbon footprint."

– Hugo Kanters, global Aviation Finance lead

Offsetting and Reduction Scheme for International Aviation (CORSIA), launched in 2016. With CORSIA, member countries and their airlines commit to tracking and offsetting emissions from international flights above a certain baseline as from 2021. The original baseline calculation approach was to include an average of 2019 and 2020 emissions for future offsetting requirements. As air traffic collapsed with the onset of the global pandemic, however, ICAO decided instead to use only 2019 levels to determine the baseline.

The need for sustainable aviation fuel adoption

While offsetting emissions may be a way for the industry to contribute positively to climate change abatement, it does not help in reducing the underlying emissions.

The use of biofuels in the aviation sector could lead to a reduction in emissions of up to 80% compared to conventional jet fuel. However, despite biofuel's long existence and the possibility to mix biofuels with conventional kerosene, it has yet to make up 1% of the market for aviation fuels. Hurdles for wider adoption include supply chain complexities, the ability to scale production and ultimately significantly higher costs compared to ordinary jet fuel. As fuel generally represents the largest operational cost component for airlines, which are generally already facing major competitive pressure globally, it is unlikely that airlines will individually start using significant amounts of biofuel without regulation and incentives.

Despite these challenges, the International Energy Agency's sustainable development scenario (SDS)[76] deems it possible (and needed) that sustainable aviation fuels make up 20% of aviation fuel demand by 2040.

76 https://www.iea.org/commentaries/are-aviation-biofuels-ready-for-take-off

Impact of the coronavirus crisis

The onset of the Covid-19 outbreak and ensuing pandemic is the most unforeseen and disruptive event in the history of commercial aviation, bringing passenger traffic almost to a halt following lockdowns and travel restrictions. At its lowest, scheduled seats were down by roughly 90% and parked aircraft peaked at 65% of the global fleet, while the remaining active aircraft were likely under-utilised and under-filled. Several countries and regions are contemplating or implementing a staggered approach to reopening air traffic by means of identifying and preserving safe travel zones where the virus risk is low. Industry experts expect, despite long-term drivers for demand remaining in place, that air travel will recover only by 2024 to pre-Covid-19 levels, with long-haul, international travel significantly lagging behind the recovery of short-haul, domestic travel.

As airlines are major employers, large outsourcers, constitute critical infrastructure and provide a necessary mode of transportation for many countries, governments are collaboratively working on helping airlines weather the pandemic through state aid schemes. Many environmental bodies have argued that the time for sustainable change is now and have voiced concerns that rescue packages need to come with green strings attached, such as road maps for reduced carbon footprints, frequent flyer levies or fuel taxes. France and Austria have followed suit by including stipulations around curbing emissions in their state aid packages (e.g. eliminating domestic routes in France).

Next steps

This year marks a first for ING to apply 2DII's PACTA methodology for aviation, which remains in early stages of development. For the sake of facilitating stakeholder dialogue and in an aim to encourage the sector towards increased transparency, ING has disclosed our aviation portfolio sector performance in this report.

We expect further breakthroughs in data availability and granularity and improvements in the model as we work together with our peers and 2DII on a continuous basis. For example, as sustainable aviation fuel is scaled in the future, we expect the model to include this as one of the key drivers to reduce emissions in a growing industry. We nevertheless feel that the current state of the model and underlying data provides a clear and relatively precise view of our current performance, giving us a solid baseline to steer against.

The insights provided by the PACTA analysis give us the tools to assess how efficiently airlines operate their aircraft and it allows us to engage in a dialogue to look for further improvements.

- To further drive our performance towards the scenario target, ING will also continue to focus on the outperformers in the industry and remains biased towards latest generation, fuel-efficient aircraft to support clients in their transition towards lower carbon emissions.
- Although feasible and scalable low-carbon alternatives aren't expected to materialise in the immediate future, ING remains keen on understanding these trends and developments and supporting them where possible.
- ING will continue to include sustainability as a routine discussion topic in dialogues with our clients and is selectively offering sustainability-linked solutions to help incentivise and drive the transition to a more sustainable industry.

Shipping

- Our performance
- Our initiatives
- Sector outlook and challenges
- Next steps

Shipping

Shipping	
Outstandings in scope	€7.3 billion

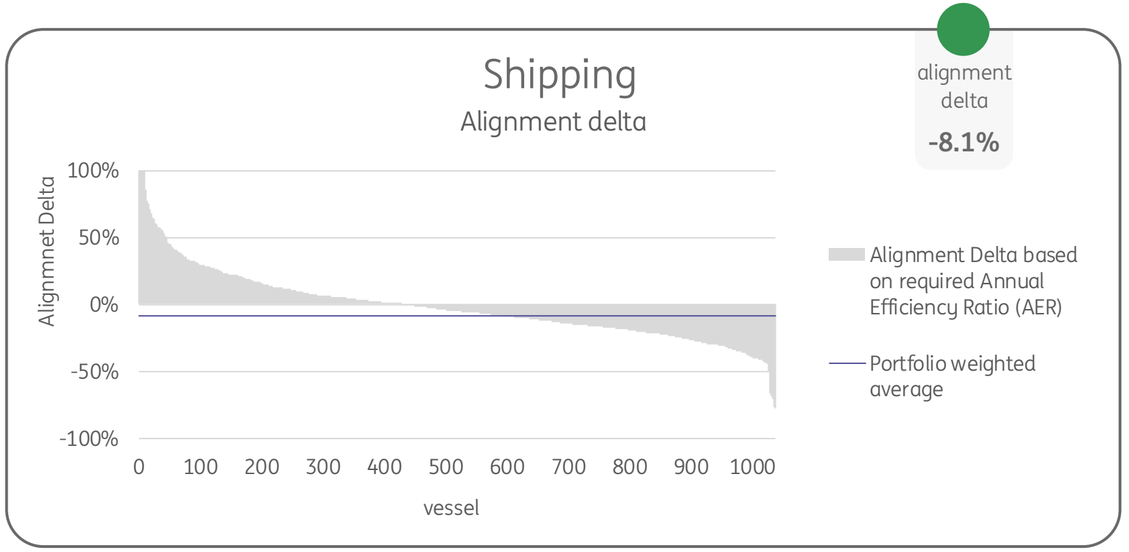
The international shipping sector accounts for 2%-3% of global emissions and has the potential to reach as much as 2.5 times that by 2050 without concerted reduction efforts.[77] While the international shipping sector was left out of the Paris Agreement, in April 2018, the International Maritime Organization (IMO) and its member states adopted a resolution outlining their initial IMO strategy on GHG emissions reductions from ships.[78]

The IMO strategy sets the ambition to "peak [greenhouse gas (GHG)] emissions from international shipping as soon as possible and to reduce the total annual GHG emissions by at least 50% by 2050 compared to 2008 while pursuing efforts towards phasing them out on a pathway of CO_2 emissions reduction consistent with the Paris Agreement temperature goals." ING is committed to supporting our clients in the shipping sector to achieve this international ambition.

Our performance

ING's shipping portfolio was measured using the UMAS Fuel Use Statistics and Emissions (FUSE) approach, which utilises ship-specific data to model a ship's distance travelled, speed, fuel consumption and resulting emissions. FUSE relies on satellite and terrestrial automatic identification system (AIS) data from exactEARTH, a satellite data provider. This data is combined with ship-specific data, such as deadweight tonnage, fuel type and a ship's age, to arrive at the ship-level emissions intensity estimate per deadweight tonne-nautical mile. This is done for each ship in ING's portfolio.

Figure 16 Shipping Portfolio Alignment Delta per vessel



77 http://www.imo.org/en/OurWork/Environment/PollutionPrevention/AirPollution/Pages/GHG-Emissions.aspx
78 http://www.imo.org/en/OurWork/Environment/PollutionPrevention/AirPollution/Documents/Resolution%20MEPC.304%2872%29_E.pdf

Applying the Poseidon Principles methodology, which identifies a required Annual Efficiency Ratio (AER) per ship type and weight range, we can see whether or not the individual ships in ING's portfolio are aligned with the required AER for progressing in line with the IMO ambition or not (see figure 16). The alignment delta (AD) is therefore the distance from the required AER for each vessel. A total AD of zero per cent or less means a shipping portfolio is aligned with the defined IMO ambition for that specific portfolio of ships. A positive AD means that the portfolio is not aligned. ING's portfolio weighted (by outstandings) alignment delta is currently considered to be outperforming the required AER with an AD of –8.1%. Figure 16 shows the alignment delta of each individual vessel in ING's portfolio. As displayed, the majority of ships in our portfolio have a negative alignment delta, contributing positively to our overall portfolio-weighted AD.

This is the first year, following our commitment to the Poseidon Principles last year, that ING has estimated our alignment delta score based on the FUSE approach. This has provided ING with valuable insights. For example, the results show that a ship's AER is also heavily influenced by how it is operated. ING's strategy has focused on working with clients with high environmental and social standards and efficient ships, which has proven effective. However, maintaining and even further improving our alignment delta will require an additional focus on engaging with clients regarding how efficiently they operate their vessels, not only on how efficiently the ships are designed to run.

As the Poseidon Principles do not allow the use of estimated data, ING is working hard to collect actual consumption data from our clients. An important next step will be to update our assessment based on this actual data to determine our AD.

Our initiatives

Eligible clients and strategy

Within the shipping sector, ING focuses on tier-1 shipowners. This means that they manage their fleet efficiently and have a market-leading position in their respective shipping sectors. We finance standard commodity-type vessels, built at yards with a solid reputation in the market and for clients where we have and can maintain a strong relationship. We engage directly with the owner/board of directors and we aim to support these clients throughout the industry cycle.

For clients that have and wish to maintain a leading market position, a solid reputation for ethical business conduct and a sustainable business strategy are important in order to manage stakeholders' interests. Given the impact of the global shipping sector on the environment, there is an increasing industry-wide focus on sustainability. Therefore, clients appreciate when banks engage in continuous dialogue and support them on various environmental topics. We have discussions on fleet renewal, engine efficiencies, fuel-type developments, vessel recycling and incentives to improve their sustainability performance and contribution to climate goals. Furthermore, we set up partnerships (funds) with third parties to support those financing requests that contribute to the sustainable transition in the shipping sector.

At ING, we don't offer or participate in scrap financing (also no cash buyers) and don't finance ship-breaking yards. Before committing to a deal, we assess the vessel age and the overall age of a clients' fleet. Addressing a company's sustainability strategy is part of our credit approval process, and we require loan covenants when it comes to ship

recycling, maintaining a green passport/inventory of hazardous materials (IHM) as well as the emissions data and statement of compliance required under the Poseidon Principles.

Poseidon Principles

ING was one of the first 11 signatories of the Poseidon Principles (hereinafter referred to as 'the Principles'), which were launched in June 2019. In the meantime, the Principles have been adopted by a current total of 18 banks covering approximately $150 billion in ship finance globally. Our global head of Shipping, Stephen Fewster, is also a member of the Poseidon Principles Association Steering Committee and serves as treasurer of the association.

The Principles aim to provide transparency on the portfolio of vessels financed by each signatory regarding CO_2 emissions and how these CO_2 emissions relate to IMO's ambition of a 50% absolute CO_2 reduction in 2050 compared to 2008. Each signatory will report its portfolio alignment score on the Principles' website starting in November of this year and in annual reports. The transparency achieved aims at contributing to industry-wide discussions on how to support the transition towards a more climate-aligned shipping industry.

Due to a lack of further regulatory guidelines, the Poseidon Principles have been adopted under the Terra approach to steer the overall climate alignment of our shipping portfolio.

"ING is proud to be one of the founding members of the Poseidon Principles and is encouraged that other banks have subsequently joined, and more are showing interest. Our focus is on financing leading shipowners who recognise the challenges of the IMO targets and are taking positive steps to achieve these. We will work proactively with shipowners and other industry participants to ensure the goals are not only achieved but also surpassed."

– Stephen Fewster, global head of Shipping

In each new financing agreement, we ask our clients to share the CO_2 emissions-related data necessary for us to comply with the reporting requirements under the Principles. The insights will enable us to take better informed decisions on which assets to finance and how these financings will impact our shipping and overall portfolio.

The quantitative alignment results published in this report, as discussed above and in the technical annex, are derived from detailed ship-specific data to arrive at an accurate estimate of each ship's annual emissions and efficiency ratio. Under the Principles, signatories are not permitted to report using estimated data. A figure based on client-reported emissions data will be published later this year in accordance with ING's obligation under the Principles.

Recycling policies

ING is one of the founding members of the Responsible Ship Recycling Standards (RSRS). The RSRS is a joint initiative between eight financial institutions to encourage shipowners to scrap their vessels in an environmentally and socially responsible manner. Within ING, we are running a pilot project where we require our loan documentation to include recycling wording referring to the Hong Kong Convention or EU Ship Recycling Regulations, as appropriate, as well as proof of a green passport/IHM (Inventory of Hazardous Material). With this pilot project, we want to understand what the shipping market is able and willing to accept and how far we can influence industry standards.

Zero-emission initiatives

Influenced by the landmark of the Paris Agreement, the Dutch government has set an ambition for 2030 to reduce CO_2 emissions for inland shipping by 50% and to have 150 vessels with a zero-emission propulsion system.

In a cross organisational effort, ING, Wartsila, Engie and the Port of Rotterdam have established Zero Emission Services (ZES). ZES goal is to enable inland vessels in the Netherlands to sail emission-free by using replaceable batteries that are charged using renewable power. The system includes a network of charging points for exchanging battery containers, technical support and an innovative pay-per-use concept for ship owners that was developed by ING. This makes it easier for shipowners to participate, which is important for helping the energy transition to succeed. After a primary life cycle in the maritime sector, it is anticipated that the batteries could have a secondary life for energy storage applications where release speed/performance criteria of power/energy are less demanding than in shipping. ZES stakeholders are also exploring whether the battery technology can be used in sectors beyond inland shipping, all in order to make inland transport more sustainable.

EIB financing framework

In 2018, ING established a green financing framework with the European Investment Bank (EIB). ING and the EIB took this initiative to support green investments for the European shipping market.

Sector outlook and challenges

The focus on decarbonisation has steadily increased over the last three years, and discussions around the impact of shipping on the climate and environment in general are part of almost every client meeting we have. The implementation of International Maritime Organisation (IMO) 2020 and its requirement to limit sulphur emissions is an example that emissions reduction is taken seriously and is rising on the industry agenda. The same applies to the Poseidon Principles, which encourage shipowners to

contribute to this initiative. Discussions around sustainability-linked financing are also accelerating as several shipowners are considering the pros and cons of these types of products, and further research is being conducted on how public financing (green bonds) can be used to support the green transition in the shipping industry.
The frequently addressed industry dilemma is the interconnectivity of the various stakeholders in the ship financing chain. In order to see significant shifts in the global fleet, shipowners should invest in new vessels and technology, banks should finance those innovative projects and charterers should be willing to pay a premium for less carbon-intensive vessels. However, such investments must be viable. Shipowners should be able to pass on increased vessel costs to all other off-takers, and regulators should incentivise those who are operating more CO_2-friendly vessels. A joint effort of all stakeholders is needed, but a significant market change like this requires time and will remain a challenge.

In the long term, radical technology shifts are required to further support a reduction in CO_2 emissions. One of the options lies in the use of different types of fuel like hydrogen and advanced biofuels, lithium-ion batteries and renewable energy sources such as wind power. LNG could contribute as a transition fuel but won't result (as an individual solution) in achieving the IMO ambition. Aside from the cost aspect, each of these technologies presents challenges of its own, with one of the concerns being the availability of these cleaner fuels. Supply will be uncertain unless there is demand. If we want vessels to burn more environmentally friendly fuel and since vessels obtain their fuel at various locations around the world, all bunker locations should collaborate to accommodate the supply of fuel. Therefore, a mass move within the sector towards cleaner fuels is considered necessary to create the demand needed and to incentivise the establishment of a cleaner fuel global bunker structure. However, one of the impediments for the sector to move in any one direction is a lack of clarity concerning which new technological development will prevail.

Initiatives like IMO 2020, the IMO's ambition and the supporting Poseidon Principles will help drive demand in this direction, especially given the unique stateless nature of the sector, which makes national regulations difficult to implement. Inter-governmental organisations therefore play an important role, also since shipping isn't embedded in the Paris Agreement. If we assess other driving forces of global change that go beyond regulatory institutions, these could come from stakeholders like banks, charterers, insurance companies and investors. These players might become more selective in supporting those shipping companies with a clear sustainability strategy and that contribute to decarbonisation.

From a wider perspective, the shift in the financial sector could be accelerated if regulators apply more favourable capital requirement treatments for assets that contribute to the energy transition. From a lenders' perspective, we think that financial regulators setting guidelines for capital requirements driven by a CO_2/sustainable efficiency scale will contribute to supporting the transition. If more environmentally friendly vessels would require less capital allocation, lenders would be more inclined to finance more efficient vessels and offer more competitive pricing. As such, innovative initiatives could become feasible (read: commercially feasible) in a shorter timeframe as the financing costs are reduced and the adoption pace is accelerated.

Finding a balance between supporting a transition and remaining a safe and secure bank for our depositors and investors is a continuous focus. Higher financing risks naturally move in parallel with return requirements. An increase in costs of capital is

therefore an add-on to the higher investments shipowners have to make to operate more CO_2-friendly vessels. By being a first mover, these investments can be high in the short term, but reduce when new technologies become market standard – leading to a 'first-mover disadvantage'. If shipowners must bear the majority of the higher capex requirements, it will negatively affect their financial performance. As the shipping market is volatile by nature, this could lead to financial stress in years when shipping rates deteriorate. There's also the risk of adopting the wrong technology as shipowners still don't feel they have the clarity they need to make large financial commitments. These are challenges for both the banking sector and the shipping industry.

Impacts of the coronavirus crisis

Across all segments, shipping is a cyclical industry. Therefore, most shipowners don't have the certainty of an annual stable cash flow and the financial ability to invest in technologies for the long term without the certainty of a financial benefit. At this moment we do not foresee that Covid-19 will have a substantial negative or positive impact. However, generally, it has spurred debate regarding policies and subsidies that will encourage sustainable development, with the potential to further drive the push for building more sustainable vessels in the future. Furthermore, Covid-19 is only impacting certain industries for about one quarter now, whereby the global future impact, financial or otherwise, is difficult to assess and driven by many unknowns. These include a potential second wave, government measures and consumer consumption. Taking into account a period of five to ten years in which the shipping industry has to develop into a more sustainable industry and the current short-term duration of Covid-19, with today's knowledge and no government support to shipowners, we currently anticipate that the Covid-19 impact on the sustainable transition will be limited in the shipping sector.

Next steps

The following is how ING will continue to support the transition in the shipping sector:

- Continue our efforts on the various sustainability-related initiatives like the Poseidon Principles. We are committed to reporting on our climate alignment score annually and working with clients towards achieving the IMO goal.
- Continue to be transparent; encourage clients to make their operations more sustainable; set high standards when it comes to environmental and social risk mitigation; and maintain an open approach to new technologies, business models and innovations to which we, as a lender, can contribute. These efforts support us in having continuous client dialogues on how all stakeholders can contribute to a more sustainable and climate-aligned shipping industry.
- These efforts have been formalised through the Poseidon Principles, an increasing number of discussions on incorporating sustainability improvement loans, firm guidelines on scrapping and IHM and initiatives likes Zero Emission Services and a green financing framework with the EIB.

4 Sustainable finance at ING

Sustainability is one of ING's key strategic pillars next to innovation and often the two go hand-in-hand. As such, sustainability has been integrated throughout our business with more than one hundred fully dedicated colleagues working on social and/or environmental objectives and innovations worldwide. Our Global Sustainability Team advises on, oversees and reports on ING's sustainability direction. In addition, this team supports the Board and the broader organisation in embedding strategies, targets and programmes in our business. Local ING branches also have dedicated sustainability teams that deliver ING's objectives in each country or region.

ING has also established a dedicated Environmental and Social Risk Team which safeguards ING's strict policies applicable to the clients and third parties we do business with and proactively engages with clients to continuously improve. ING has also set up a Sustainable Finance Team which supports sustainable product innovation and works with clients on finding tailored green and social financing solutions within our global Wholesale Banking business. While all teams work in concert to deliver on our sustainability objectives, this chapter highlights the role of the Sustainable Finance Team in supporting clients via our products, services and strategic governance designed to help drive our Terra commitment globally.

Our role

Sustainable business is better business. That's why we see it as our responsibility to use our financing, advisory products and services to actively support clients' transition to new sustainable business models that will ensure their success in the future. As a financial institution, we can play a role by financing change, sharing knowledge and using our influence.

ING's Sustainable Finance Team was started in 2012 and now consists of more than 35 people with global coverage across all sectors. We cover a range of financial instruments including lending, green bonds and sustainable investments (equity). ING's Sustainable Finance Team pursues sustainable business opportunities. We structure, coordinate and advise our clients on specific green/social investments, transition pathways and linked investment strategy to that to access the increased demands for green funding. This is in addition to our teams already focusing on a dedicated sector, like our Renewables Team.

The team supports a range of clients across all our sectors in achieving their sustainability goals. We support those with a strong sustainability track record, an ambitious agenda and those that are addressing resource scarcity and seeking financing for sustainable deals, such as in renewable energy, green buildings, waste management and water.

The team brings together sustainability experts and in-depth wholesale banking knowledge to identify sustainable clients and opportunities.

Pioneers in sustainable finance

We make our biggest contribution to a sustainable future through our financing. We are committed to better understanding the impact of our activities and working with our clients to drive progress on climate action and the Sustainable Development Goals.

We will continue to fund companies and sectors that are helping to keep global warming below two degrees Celsius. This includes funding projects that advance renewable energy, promote the circular economy and help combat climate change.

We have financed billions of euros of renewable energy projects, green buildings, sustainable transport and infrastructure, among others. We say 'no' to certain companies and sectors, and 'yes, but' to others, outlining sustainability improvements they have to make based on our ESR framework. We finance sustainable projects through green loans, green bonds and other innovative products and financing structures, such as our sustainability improvement loan, which we pioneered back in 2017. We link the loan's interest rate to a company's environmental, social and governance performance (ESG). The better their ESG performance, the more attractive the terms of the loan will be for them. We are committed to playing a major role in supporting sustainable development, socially responsible behaviour and policies through financing. Sustainability improvement loans were created specifically to support our clients in their transition to align with the Paris Agreement.

Our Sustainable Structured Finance team acts as a laboratory for new sustainable business models that need financing in Europe, the Middle East and Africa. The Sustainable Investments team supports sustainable scale-ups that have a proven concept and make a positive environmental impact. Through these activities we help originate, structure and execute companies and projects that support sustainable development in areas such as the circular economy, energy transition, waste and water supply or treatment.

We continue to launch products aimed at encouraging companies to get measured on ESG goals, such as the world's first sustainability improvement derivative and the world's first sustainability improvement capital call facility. This way, we encourage and reward clients who are already sustainable as well as clients working to become more sustainable.

To support the strong growth of the sustainable finance market and to meet green funding needs, we designed the ING Green Bond Framework in line with ICMA's Green Bond Principles, which meets the highest standards on transparency and disclosure.

We help others issue green bonds too. In 2019, we supported 62 green, social and sustainability bonds and 61 sustainability improvement loans. We also helped issue the largest green Schuldschein so far, with a German car manufacturer.

ING also takes part in various initiatives, contributing our knowledge and expertise to help develop new market standards. One example is our part in the Loan Market Association (LMA) Green Loan Principles (GLP) and the Sustainability Linked Loan Principles (SLLP) and, more recently, the two official guidance documents on each set of principles (G-GLP, G-SLLP) launched by the LMA, Loan Syndications and Trading Association and the Asia Pacific Loan Market Association.

5 Conclusion

With this report, it is ING's aim not only to provide a transparent update on our commitments and progress to achieve them, but also to disclose the methods and our performance for the remaining four sectors that had not yet been included last year. It is our hope that the metrics presented and the reporting approach we've taken can serve as an example to our sector and stakeholders of how lending portfolios can be communicated in light of climate goals.

Our initial Terra Progress Report was a major first step in this direction within our sector. Our hope that it would be a catalyst for meaningful dialogue with peers, clients, investors and our stakeholders was not in vain. Since its publication, we have seen an increase in collaboration with our peers and convening organisations like UNEP FI. We have had numerous discussions with investors, and have contributed to expert and technical papers, panels and consultations, such as SBTi's Expert Advisory Group and the Collective Commitment to Climate Action, where we serve as co-chair. All of these efforts are part of our theory of change: to learn by doing and then share our experience with our sector in order to extend our impact beyond ourselves.

This report is a second major step with more to come, but we stand by our choice to be proactive in our communication rather than waiting for a 'perfect' solution with perfect data. By doing so, we are able to offer a tangible example of what portfolio climate alignment reporting could look like and what the challenges are. We welcome clients, peers, academics, policymakers, regulators and civil society to think with us, help us improve and join the movement of moving from commitment to action.

Below we list a number of topics that we acknowledge as next steps and points for further development. We look forward to hearing your thoughts on the work we've done so far, the topics below and how you see the way forward.

Methodology refinement

We recognise that methodology development remains in progress. This is true even within the context of the initiatives ING is active in, such as the SBTi, the PACTA pilot and the CCCA. As data becomes more available and accurate, as scenarios are updated and as methodologies surface, we will continuously assess whether our approach should change. In short, this is still a new and evolving field, and all involved will need to be agile and adapt to new developments. Though we've explained our approach so far, we are committed to these processes of refinement and development. If needed, we will ensure that any changes to the methodology or data that materially impact our reporting are clearly communicated, and that any restatements are indicated and explained in future reports.

Bank standardisation

One of the desired outcomes is for a viable standard to emerge for banks globally to measure the climate alignment of their loan books: a standard that allows for comparison and aggregation of data across the sector. To achieve this, uniformity must be achieved on many levels, starting with physical, asset-level client data. Further comparison will depend on other methodological choices, like attribution and scope. We see great possibilities for standardisation within the bounds of the target-setting methodologies ING has applied. However, this will, as already mentioned, need to be a collaborative and iterative process – and we are still in the early stages. ING is working closely with peers and partners to overcome some of the barriers of standardisation.

However, ING also sees the pragmatic necessity for each bank to consider approaches in the context of its own portfolio composition. As different banks will have very different sector focuses, this may result in the need for a varied set of methodologies and approaches. As such, we see the conclusion emerging that the most like-for-like comparison scope across banks might be sector-specific alignment, for example by comparing power generation portfolio results among banks active in that sector. For that reason, ING encourages stakeholders to look at each bank individually, given their specific portfolios, and to consider comparing performance on a sector level.

Scope expansion

We have made a deliberate choice to focus initially on the sectors that contribute significantly to the global carbon footprint. However, during the last year we were regularly asked what will happen when we have completed our work on these carbon intensive sectors. The methodologies currently being applied are limited to a specific scope of sectors. Expansion will require more data, new scenarios and more iterative testing phases.

To that effect, we are discussing with peers and partners which sectors should be in the next wave. For example, the agriculture and land-use sector has long been identified as a major contributor to GHG emissions. But due to the lack of data and climate scenarios specifically tailored for this sector, alternative approaches need to be developed. We are keen to continue these types of exploratory discussions and, in the meantime, will continue our progress in the sectors currently in scope.

Outcome vs. impact

There is a difference between the outcomes of portfolio climate alignment and the impact of absolute GHG emissions reduction in the real economy. Challenges such as ‘portfolio leakage’, where a portfolio’s high-carbon or green share is reduced simply by being redistributed to another portfolio, present limitations to how much a bank can control in relation to climate impact, especially when applying capital allocation choices as a tool for steering.

This is why ING values an inclusive approach where clients are supported in their transition. But even this approach presents challenges with regards to measuring and attributing actual impact to ING's actions. For example, if ING were to take robust measures to support and engage with a client to transition, who is to say that their subsequent actions were not actually in response to pressure from multiple stakeholders or their own internal decision-making. It would therefore be difficult for ING to claim that impact was a result of our efforts alone. This is because our influence is often indirect.

In light of this challenge, ING joined the Evidence for Impact Partnership, launched by 2DII in 2020. Working with the sector, stakeholders and partners to better understand how to evaluate this challenge, the initiative's mission is to test strategies, such as engagement and divestment, for their effectiveness regarding emissions reductions in the real economy. This initiative will support a multi-year study that should help guide practitioners towards efforts that yield the best results.

In closing, we hope you've found this report insightful and inspiring in the face of the climate crisis our world faces. Though we are committed to doing our part, there's only so much an individual bank can do. That's why there is an urgent need for action by all, including open, multi-stakeholder collaboration with civil society organisations, clear national climate road maps and strong regulation.

With that, it is our hope that the work we have reported on in this progress update will lead ING and our sector closer to Paris Alignment with the help of strong governmental policies, technological development and the ingenuity and passion of our clients. Everyone has a part to play. Thank you for caring about how we're playing ours.

6 Governance annex

Climate Change Governance

ING instated the Climate Change Committee (CCC) in 2018 in order to secure board-level oversight of strategic climate-related risk and opportunity management, which includes our ambitions and strategies related to Terra. This executive committee is chaired by ING's chief risk officer (CRO) and co-chaired by the Board member responsible for Wholesale Banking. It is further comprised of a number of Board members, including the chief financial officer (CFO), and senior managers from the Wholesale and Retail business. The CCC is advised by an internal Climate Expert Group (CEG) made up of experts from various front office, sustainability, risk and other departments.

More specifically, the CCC is responsible for:

- Mandating appropriate processes by which ING identifies and manages climate-related financial risks and opportunities.
- Guiding policies, strategy, performance objectives and monitoring pertaining to climate-related financial risks and opportunities.
- Monitoring and overseeing progress to achieve relevant goals and targets.
- Guiding external communication and transparency requirements.

The CCC meets six times a year (every other month). The agenda is prepared by the CEG (which meets monthly) and consists of minutes of the last meeting, proposals for decision, proposals for information and progress on the action list. Terra is a fixed agenda item in all CEG and CCC meetings.

Terra is further supported on a day-to-day basis by the global head of Sustainability who oversees the strategy, monitoring and reporting on Terra and the head of Sustainable Finance who oversees opportunity identification and client engagement related to Terra in Wholesale Banking. The Terra Team, consisting of four full-time employees, works closely with the sector teams and business units on methodology development, implementation, monitoring and reporting.

The Terra Team also works closely with our colleagues in the risk domain to align and support risk disclosures where possible. To further strengthen the alignment between our risk and opportunity management, both are governed by the CCC.

Reporting process

ING aims to publish a review of our Terra progress on an annual basis. The next update in 2021 will include an update on our progress for the sector results presented in this review. In line with this reporting cycle, ING will communicate any changes to our measurement and target-setting approaches with appropriate restatements if and where necessary.

7 Technical annex

The methodologies applied in the Terra approach can each be read about in their source documentation, which is given in Table 3. This annex therefore does not expound upon the methodologies themselves but rather provides an overview of which methodologies are applied for which sector, which choices are made within the application of those methodologies and the data sources used as inputs.

For detailed information regarding calculation approaches, methodological underpinnings, attribution rules, etc., please refer to the PACTA for Banks methodology paper and supporting materials and the Katowice Banks application paper for the sectors fossil fuels, power generation, automotive, aviation, cement and steel, the Poseidon Principles for shipping, the PCAF report for residential real estate and Deltaplan Duurzame Renovatie for commercial real estate.

The table also gives the climate scenario applied for each sector as well as the measurement methodology's primary output and the metric used in each sector's convergence charts.

Conceptual building blocks for target-setting

In order to set climate alignment targets, two key building blocks are needed. First, granular client-level insights and measurements are vital for decision-making and client engagement. Second, a normative benchmark is required to guide decision-making towards an intended outcome (e.g. climate scenario or target).

Therefore, there are two types of methodologies associated with the above-mentioned building blocks:

1. a measurement methodology that identifies and allocates client-level data to a financial portfolio and
2. a methodology that applies a scenario or target to that portfolio in order to set targets.

Table 3 Overview of approaches applied and output types

Sector	Measurement methodology	Target-setting methodology	Scenario	Primary output	Reporting metric
Power generation	PACTA	PACTA	IEA (WEO) SDS 2018	Technology mix	kg CO_2e / MWh
Fossil fuels	ING portfolio / revenue segmentation[79]	2DII / Katowice Banks	IEA (WEO) SDS 2019	Absolute € O/S	Absolute € O/S
Commercial real estate (NL)	Delta Plan	Paris-proof method	Plan bureau voor de leefomgeving (PBL), derivative of the Paris Agreement	EPC label distribution/ estimated consumption data	kg CO_2 / m^2
Residential real estate (NL/DE)	PCAF	SDA (SBTi)	IEA (ETP) B2DS 2017	EPC label distribution/ estimated consumption data	kg CO_2 / m^2
Cement	PACTA	SDA (SBTi)	IEA (ETP) B2DS 2017	CO_2 intensity per unit of production	t CO_2 / t cement
Steel	PACTA	SDA (SBTi)	IEA (ETP) B2DS 2017	CO_2 intensity per unit of production	kg CO_2 / t Steel
Automotive	PACTA	PACTA	IEA (ETP) B2DS 2015 (retirement figures) & 2017	Technology mix	kg CO_2 / km
Aviation	PACTA	SDA (SBTi)	IEA (ETP) B2DS 2017	CO_2 intensity per passenger km	g CO_2 / pkm
Shipping	UMAS – FUSE / Poseidon Principles	Poseidon Principles	IMO 2050 ambition	CO_2 intensity per tonne nautical mile	kg CO_2 / tnm

Arriving at a CO_2 intensity metric per sector

The CO_2 intensities displayed in the Climate Alignment Dashboard are calculated by applying different measurement methodologies (see Table 3).

For example, for power generation, we look at the mix of power generated in terms of production capacity by gas-fired power stations, coal-fired power stations, hydro plants, wind turbines, solar PV, etc. Based on this mix and historical production statistics, we derive an emissions intensity per megawatt hour (MWh) using emissions factors. For real estate, we look at the mix of energy labels per building type; and for cement, by looking at the mix of the types of production processes applied.

The intensities are normalised per unit of production, as indicated in the table above. In the same way, the relevant climate scenarios are converted into CO_2 intensity pathways. The scenario determines the target and the market determines the starting point. The data points in-between are calculated based on the IEA scenario data, except for commercial real estate and shipping, which use the Plan bureau voor de leefomgeving (PBL) and IMO's 2050 ambition, respectively.[80] For ING, our portfolio's 2018 or 2019 performance indicates our starting point. The line between our portfolio and the scenario target determines our convergence pathway as we converge towards the scenario target.

79 Credit Portfolio Alignment – An application of the PACTA methodology by Katowice Banks in partnership with the 2 Degrees Investing Initiative

80 https://www.pbl.nl/nieuws/2016/parijs-akkoord-betekent-halvering-nederlandse-co2-uitstoot-in-2030 and http://www.imo.org/en/OurWork/Environment/PollutionPrevention/AirPollution/Pages/GHG-Emissions.aspx

Limitations of the CO_2 intensity metric

While converting the sector economic activity output to CO_2 intensity per unit of production provides a clear, simple way of demonstrating our current portfolio composition relative to the benchmark, we acknowledge a number of limitations that are inherent to this conversion.

First, the use of emissions factors introduces some uncertainty. To arrive at this figure, we must translate production capacity to estimates of actual production or consumption and then multiply this by localised average emissions factors.

Any use of average emissions factors or conversions from capacity to production based on estimates means introducing less-accurate input, which will reduce the preciseness of the results. Furthermore, intensity metrics do not provide the full picture. In order to limit global warming to well-below two degrees Celsius, the world will need to remain below certain levels of absolute GHG emissions (between 770 and 1320 gigatons).

Due to these limitations, it is important to note that while we currently measure and report on CO_2 intensity per sector, the steering is informed internally by client-level data in line with the PACTA approach, for example. Where possible, we focus not only on what a client currently owns and operates but also on what they plan to build in the coming years in both a relative and absolute sense and whether or not this will contribute enough to climate goals.

It is also critical to note that data and methodologies are continuously improving. ING publishes on the basis of the best available data and most suitable methodologies and methodological choices for our portfolio and we do so on a best-effort basis. Any calculation errors or updates as a result of methodological changes or new information that lead to materially different outcomes than previously reported will be addressed and restated in following reports. The results are currently not audited.

PACTA – 2˚ Investing Initiative (2DII)

2˚ Investing Initiative

The 2˚ Investing Initiative is an international non-profit global think tank on developing climate and long-term risk metrics and related policy options in financial markets. It's backed by bodies including the European Commission and various European governments, and supported by academics, expert groups and civil society.

PACTA

The Paris Agreement Capital Transition Assessment (PACTA) was originally developed for equity and bond portfolios building upon research conducted by 2DII within the EU Horizon 2020 Sustainable Energy Investing Metrics project.

In September 2020, 2DII announced the launch of PACTA for Banks, a free, open-source climate scenario analysis toolkit based on the Paris Agreement Capital Transition Assessment (PACTA) methodology. The methodology, data, and software are available here.

Banks can use the toolkit to help steer their lending in line with climate scenarios, to inform their decisions around climate target-setting and to gain insights into their engagement with clients on their respective climate actions.

PACTA application for steering

The PACTA methodology currently provides client-level, forward-looking analysis for most sectors. From this, ING has been road-testing client-level CADs that make use of the full range of PACTA analysis at client level. This includes the volume analysis (or production capacity build-out projection) of each technology and how this compares to what it should be to align with climate scenarios, as well as the forward-looking technology mix of the client based on the CAPEX plans of each client and how these compare to the climate scenario requirements.[81] We are then able to provide clients with these insights and how they compare to peers and the market within this context. Such insights can be useful for client engagement and steering. The tech mix and volume analyses are further elaborated upon in the respective methodology papers. Below we provide an overview of the options given in the PACTA methodology as well as the specific choices made by ING – largely shared by the other Katowice Banks.

81 For internal steering, the power generation and automotive portfolio (with other sectors being added over time) are estimated for two points in time: present-day, and in five years (using forward-looking production data). Five years is the furthest horizon for which CAPEX forecasts were considered most meaningful. Acknowledging that the furthest meaningful horizon varies across sectors, this five-year horizon is adopted as best common denominator. Additionally, in bank loan portfolios' refinancing rates are on average not far off from the five-year horizon (in some sectors advancing to seven/eight years) providing an opportunity to re-balance the portfolio even if the underlying asset has an economic life of 20-30 years.

Table 4 Summary of choices available in PACTA made by ING

(Credit Portfolio Alignment – An application of the PACTA methodology by Katowice Banks in partnership with 2DII)

Methodology steps	Options in PACTA	ING's choice
Scoping		
Financial products and services	▪ In principle the methodology is applicable to all financial products. But for some products (e.g. derivatives) the link with the real economy can be more tenuous and require at this stage more thought on its application.	▪ Term loans and Revolving Credit Facilities
Exposure type	▪ Capital exposure ▪ Client relationship	▪ Capital exposure
Financial indicators	▪ Net commitment/nominal amount ▪ Gross commitment including guarantees ▪ Gross commitment ▪ Drawn amount ▪ Exposure at default (EAD) ▪ Credit limit	▪ Drawn amount (outstandings)
Sector segmentation	▪ Primary activity ▪ Revenue weighted (not automatic)	▪ Primary activity ▪ Revenue weighted for the energy sector if data is available
Measuring indicators		
Types of indicator	▪ Volume ▪ Technology mix ▪ Emission intensity	▪ All used + ▪ Financing indicator (trend and mix)
Allocation rule	▪ Unweighted approach ▪ Portfolio weight approach ▪ Balance sheet weighted approach	▪ Portfolio weight
Benchmarking		
Alignment approach	▪ Convergence approach ▪ Trajectory approach	▪ Convergence approach for physical indicators and trajectory approach for financial indicators
Choice of benchmark	▪ Economy as a whole ▪ Regional subset ▪ Institutional subset	▪ Regional subset (world, OECD, Europe) ▪ Institutional subset (corporate economy)

Data sources and Scoping

Data sources

In order to produce the Terra results, three types of data were used: 1) the bank's lending portfolio for the sectors in scope, 2) external databases and 3) climate scenarios and the technology pathways they provide, or in the absence thereof, GHG intensity targets. The external databases undergo quality assurance processes and are updated regularly.

Table 5 Data source by type and sector

Sector	ING portfolio	Scenario/target [82]	Market	Client-level external data	Emissions factors	Conversion factors
Power generation	ING (Vortex 2019YE)	SDS IEA (WEO) 2018 [83]	Global Data [83, 86]	Global Data [83]	2DII	2DII
Fossil fuels	ING (Vortex 2019YE)	IEA (WEO) SDS 2019	NA	NA	NA	NA
Commercial real estate (NL)	CFP Green Buildings [84]	Dutch Green Building Council/ Delta Plan	NA	Energy Performance of Buildings Directive (EPDB)	CFP Green Buildings	NA
Residential real estate (NL/DE)	Datalake mortgages	IEA (ETP) B2DS 2017 [85]	NA	RVO (Dutch government agency)	Guidehouse	NA
Cement	ING (Vortex 2019YE)	IEA (ETP) B2DS 2017 [83]	Global Cement Directory [83, 87]	Global Cement Directory [83]	2DII	NA
Steel	ING (Vortex 2019YE)	IEA (ETP) B2DS 2017 [83]	Steel Institute VDEh [83, 88]	Steel Institute VDEh [83]	2DII	NA
Automotive	ING (Vortex 2019YE)	IEA (ETP) B2DS 2015 (retirement figures) & 2017 [83]	AutoForecast Solutions [83, 89]	AutoForecast Solutions [83]	2DII	2DII
Aviation	ING (Vortex 2019YE)	IEA (ETP) B2DS 2017 [83]	CIRIUM	CIRIUM	2DII	NA
Shipping	ING (AQR 2019YE)	Poseidon Principles	UMAS 4th IMO GHG Study	UMAS – FUSE	UMAS – FUSE	NA

NA Not applicable.
82 It should be noted that due to the continued effects of the pandemic, in the future, scenarios could be updated with significant changes stemming from world-wide lockdowns and travel restrictions. ING will review such changes and will update scenarios where deemed necessary.
83 Data processed and provided by 2DII.
84 ING REF clients onboard their property data themselves via the CFP portal.
85 Data provided by Guidehouse.
86 Refers to the corporate economy only.
87 Ibid.
88 Ibid.
89 Ibid.

Regionality

Climate scenarios may be applied at global or regional level (if available) depending on the sector. Automotive for example is a global business whereas technologies used for power generation vary considerably by region (OECD, EU, non-OECD; as defined by IEA) with each having regional targets and thus clients will be analysed within these boundaries.

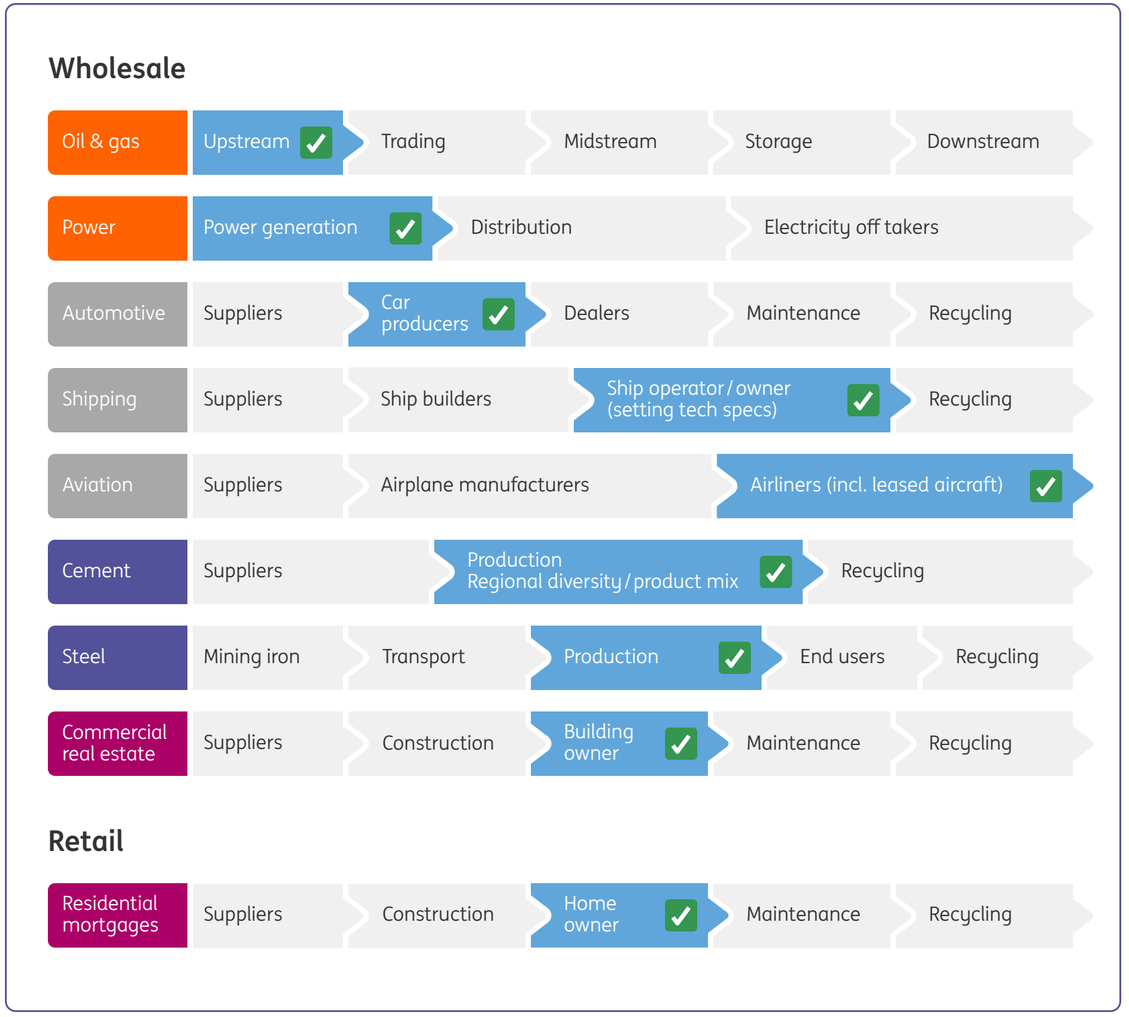
Portfolio scoping: industry classification systems and financial products

The data scoping process is aimed at capturing the relevant loan portfolio for matching and analysis containing 1) the part of the value chain within each sector in scope (identified by NAICS classification system) and 2) the product types that most accurately represent lending on a continuous basis and thus balance sheet allocation within our loan portfolio.

Scoping within each sector

The analysis focuses on capturing the drivers of emissions in each sector. For example, in the power generation sector we focus on the power producers rather than transmission or distribution networks or off-takers, and in automotive we focus on car manufacturers rather than part suppliers; we consider that power producers and car manufacturers drive the transition from high to low-carbon technologies. Figure 17 shows each part of the value chain in scope for Terra and therefore identified by the relevant group of NAICS codes.

Figure 17 Portfolio scoping



Product scoping

The following product types are captured in the scoping exercise: revolving loans and term loans, each based on loan outstandings. Within these two product types, we distinguish broadly between two types of loans:

- **General corporate purpose loans** will be linked to the borrower which can be a subsidiary or the ultimate parent company provided that the borrower is known in external data. 'General corporate purpose' means that we don't control the use of proceeds, so we assume that the funding is at the disposal of the group including the parent; and
- **Special purpose loans**, on the other hand, are ring-fenced loans where >50% of the use of proceeds will be used for a specific purpose (e.g. project-based or asset-based finance) and as such can generally be matched to physical asset(s), provided external data sources cover the relevant physical asset(s).

Glossary

2DII: 2 Degrees Investing Initiative

Asset-level data (ALD): economic activity data of physical assets (power plants, oil fields, cars, coal mines, etc.) acquired from external industry databases.

B2DS: IEA (ETP) Beyond 2 degree scenario

CCCA: Collective commitment to climate action

EIB: European Investment Bank

EPC: Energy performance certificates

ESG: Environmental, Social and Governance

EU: European Union

GBP: Green bond principles

GHG: Greenhouse gases

IEA: International Energy Agency

ICMA: International Capital Market Association

OECD: Organisation for economic co-operation and development

PACTA: Paris Agreement Capital Transition Assessment

PCAF: Partnership for carbon accounting financials

PRB: Principles for responsible banking

RVO: Netherlands Enterprise Agency

SBTi: Science Based Targets initiative

SDA: Sectorial decarbonization approach

SDS: Sustainable development scenario

TCFD: Task Force on climate-related financial disclosures

UNEP-FI: United Nations environment programme finance initiative

Important legal information

Nothing in this document expressed or implied, is intended to or shall create or grant any right of any cause of action to, by or for any person (other than ING Bank N.V.)

ING Group's annual accounts are prepared in accordance with International Accounting Standard 34 'Interim Financial Reporting' as adopted by the European Union ('IFRS-EU'). In preparing the financial information in this document, except as described otherwise, the same accounting principles are applied as in the 2019 ING Group consolidated annual accounts. All figures in this document are unaudited. Small differences are possible in the tables due to rounding.

Certain of the statements contained herein are not historical facts, including, without limitation, certain statements made of future expectations and other forward-looking statements that are based on management's current views and assumptions and involve known and unknown risks and uncertainties that could cause actual results, performance or events to differ materially from those expressed or implied in such statements. Actual results, performance or events may differ materially from those in such statements due to a number of factors, including, without limitation:

(1) changes in general economic conditions, in particular economic conditions in ING's core markets, including changes affecting currency exchange rates,
(2) the effects of the COVID-19 pandemic and related response measures, including lockdowns and travel restrictions, on economic conditions in countries in which ING operates, on ING's business and operations and on ING's employees, customers and counterparties,
(3) changes affecting interest rate levels,
(4) any default of a major market participant and related market disruption,
(5) changes in performance of financial markets, including in Europe and developing markets,
(6) changes in the fiscal position and the future economic performance of the United States, including potential consequences of a downgrade of the sovereign credit rating of the US government,
(7) consequences of the United Kingdom's withdrawal from the European Union,
(8) changes in or discontinuation of 'benchmark' indices,
(9) inflation and deflation in our principal markets,
(10) changes in conditions in the credit and capital markets generally, including changes in borrower and counterparty creditworthiness,
(11) failures of banks falling under the scope of state compensation schemes,
(12) non-compliance with or changes in laws and regulations, including those financial services and tax laws, and the interpretation and application thereof,
(13) geopolitical risks, political instabilities and policies and actions of governmental and regulatory authorities,
(14) ING's ability to meet minimum capital and other prudential regulatory requirements,
(15) outcome of current and future litigation, enforcement proceedings, investigations or other regulatory actions, including claims by customers,
(16) operational risks, such as system disruptions or failures, breaches of security, cyber-attacks, human error, changes in operational practices or inadequate controls including in respect of third parties with which we do business,
(17) risks and challenges related to cybercrime including the effects of cyber-attacks and changes in legislation and regulation related to cybersecurity and data privacy,
(18) changes in general competitive factors,
(19) the inability to protect our intellectual property and infringement claims by third parties,
(20) changes in credit ratings,
(21) business, operational, regulatory, reputation and other risks and challenges in connection with climate change,
(22) inability to attract and retain key personnel,
(23) future liabilities under defined benefit retirement plans,
(24) failure to manage business risks, including in connection with use of models, use of derivatives, or maintaining appropriate policies and guidelines,
(25) changes in capital and credit markets, including interbank funding, as well as customer deposits, which provide the liquidity and capital required to fund our operations,
(26) the other risks and uncertainties detailed in the most recent annual report of ING Groep N.V. (including the Risk Factors contained therein) and ING's more recent disclosures, including press releases, which are available on www.ING.com.

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