

JULY 2024

# NZBA PROGRESS REPORT 2024

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UPDATED IN JULY 2024:  
SHIPPING  
AVIATION  
ALUMINUM  
RESIDENTIAL REAL ESTATE  
AGRICULTURE

**THE FUTURE  
IS YOU**



**SOCIÉTÉ  
GÉNÉRALE**

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# INTRODUCTION

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# OUR APPROACH

This document describes the progress made by Societe Generale on alignment metrics and targets and reflects the actions taken to date.

Societe Generale has been at the forefront of sustainable and positive impact finance since 2001, developing a strong renewable energy franchise, while contributing to the UNEP “Positive Impact Finance Initiative” as a Founding Member.

It has since developed an extended technical expertise, with teams actively contributing to the environmental transition.

.....



**HACINA PY**  
GROUP CHIEF  
SUSTAINABILITY  
OFFICER

*“The  
decarbonisation  
objectives  
derived from*

*the Paris Agreement call for  
investments of a magnitude hardly  
observed before. We are facing a  
complete change of paradigm,  
which requires to rethink the way  
we produce, consume and interact.*

*This is a significant opportunity but  
also a major source of disruption if  
we do not engage collectively and  
act proactively.”*

.....

The 2015 COP 21 summit in Paris marked a turning point, ushering in a new era of heightened environmental awareness and commitment to addressing climate change on a global scale. It acted as a catalyst, creating unprecedented global cooperation and action on climate issues. At this time, Societe Generale announced its first objectives: to restrict coal business and to step up renewable energy activities.

We have not stopped there. Societe Generale has since reinforced its ambition and committed to tackling other fossil fuel energies.

We started working towards aligning our credit portfolios with the goals of the Paris Agreement, and in 2020, published a common alignment methodology in collaboration with other international banks. In 2021, we went one step further and joined the Net Zero Banking Alliance as a Founding Partner. This decision marked Societe Generale’s determination to accelerate the transition through the alignment of its most emissive lending portfolios with pathways reaching net zero emissions by 2050, consistent with a maximum temperature rise of 1.5°C above pre-industrial levels in 2100.

Conscious that decarbonisation is a global challenge that needs to be addressed collectively, we are working closely with our clients and peers to accelerate the transition. Alongside our peers, we contribute to many working groups in various sectors to promote transparency and accountability, and to support research and development in the areas of sustainable finance and decarbonisation – developing partnerships and entering alliances with expert organizations such as the Poseidon Principles, the Hydrogen Council, and more recently, the Sustainable Steel Principles, the Sustainable Aluminium Finance Framework, and the Pegasus Guidelines with a goal to develop common standards and facilitate comparability across industries.

We are committed to continuing our progress towards net zero; the work is on-going. We realize that this is going to be an iterative process, requiring us to adapt and improve our frameworks as data availability progresses, low carbon technologies become available, and, last but certainly not least, as demand, driven by regulation and incentives, starts to align with the goals of the Paris Agreement.

We expect governments, policy makers and other key stakeholders to help accelerate some of the trends we have started to observe, and know that some technologies will only reach scale and risk-acceptance if strong incentives are provided. We regularly share our expertise and views on how policies should support decarbonisation.

We cannot wait for all stars to align, but must act now. In this report, we are pleased to share our first decisive steps towards decarbonisation for a number of highly carbon intensive sectors. For each of these sectors we have defined the main decarbonisation challenges and the key transformation drivers incorporating our clients’ perspectives shared during technical discussions centered around their own visions and decarbonisation strategies. This field-based knowledge, coupled with science-based inputs and peer collaboration on the development of relevant alignment methodologies has enabled us to set our alignment objectives.

# OUR APPROACH

Our strategy for this first wave of alignment work has been twofold:

- Reduction of our fossil fuel CO<sub>2</sub> footprint in absolute terms, by stopping certain activities and terminating some relationships;
- Reduction of the carbon intensity of our portfolios in other sectors by reducing our support to the most carbon intensive activities while growing our financing of low carbon solutions;

Some technologies that will allow sectors to reach net zero are not yet mature and might be available at scale only after 2030 or even 2040. As such, our first step has been to define 2030 intermediary targets for the most carbon intensive sectors based on our current knowledge and as an integral part of the effort required to reach net zero by 2050.

For each sector, our alignment objectives are tied to the development of new solutions to finance the growing capex needs for the transition. Work with our experts and with industrials and engineers has shown that the transition requires a major transformation necessitating collaboration beyond traditional sector silos. To adapt to this new paradigm we launched a major transition program in early 2021 called “The Shift”, for which some details are provided in this report. This large initiative will enable the design of relevant decarbonisation or low carbon solutions throughout the different value chains.

The first concrete realizations are promising, and some are shared in the various sectoral pages. Our ambition under “The Shift Program” is to grow innovative capabilities to service the transition and to accompany our clients as a key partner in their own respective transitions. We believe that part of the solution will come from new actors developing new technologies, and have thus decided to allocate 1bn€ to invest in the future leaders of the transition, and in nature-based solutions and impact-based projects.

The path to decarbonisation involves the entire bank, including all business and service units. We have been investing significant time and effort in the training of our staff through different channels, and we have been developing tools at the service of innovation. We have collectively learned so much, and strive to continue progressing on our ambition to contribute to the environmental transition in a very concrete manner.

This report endeavors to share some of our knowledge with our stakeholders, and to affirm our openness to exchanging views and ideas!

For each sector,  
our alignment  
objectives are tied  
to the development  
of new solutions  
to finance  
the growing  
capex needs  
for the transition.



# WORKING WITH POLICY MAKERS TO UNLOCK THE TRANSITION

As the consequences of climate change and nature degradation are accelerating, it is vital that we continue to act collectively in mainstreaming sustainability into each aspect of the real economy. Financial institutions can play a key role in channeling capital flows towards sustainability goals, and it is critical that conditions are in place to enable the real economy to transition, including supportive measures from policymakers.

Since 2018, Societe Generale has been actively engaging with policymakers to contribute to their efforts towards enabling a policy environment which incentivises the real economy transition.

The challenges for banks in scaling sustainable finance and aligning their portfolios with trajectories compatible with 1.5°C scenarios are huge in an economy heading to well above +2°C. Cancelling financed emissions through immediate withdrawals from high-emitting assets or through the termination of relationships with high-emitting corporate clients would be inefficient measures for reaching the vital decarbonisation of the real economy at a global level. Hence, Societe Generale's engagement with policymakers is performed with the objective of promoting the establishment of a policy framework where banks should not only be incentivised to gradually "reduce their financed emissions", especially on emitting sectors where alignment targets are necessary, but also to "finance emissions reduction" (i.e., net-zero technologies and infrastructures).

Financing capacities are available, but we observe that creditworthy low carbon projects are missing. This starts with the need to change demand, to progress to an economy of usage, and to switch to more electrification, which implies new public infrastructures, capacity building and skills development.

Public policies have a role to play in facilitating corporate preferences to invest in low-carbon solutions over existing technologies. Some regions have already begun to apply such measures, such as in the United States of America where the Inflation Reduction Act pulled forward and derisked investment across sectors to ease decarbonisation financing. In the EU, we have welcomed the European Climate Law, the EU's Fit for 55 package and the Net Zero Industry Act. From this perspective, any incentives for companies that would ensure a minimum and predictable rate of return on investment over the economic life of the projects would give banks greater visibility over the long-term viability of projects, while limiting technological risk.

Global international banks can play a role in financing real economy transition both regionally and globally, including in emerging and developing countries. Supporting emerging and developing countries in their transition requires an ecosystem of public, multilateral and catalytic funding partners to design blended finance transactions. It is also important that policymakers continue efforts to strive for interoperability of sustainability norms globally to ensure a level playing field for international banks active in emerging and developing countries.



**FRIDA MEKOU**  
DIRECTOR SENIOR  
ADVISOR – PUBLIC  
AFFAIRS DEPARTMENT

*"Societe Generale's engagement with policy-makers is performed with the objective of promoting the establishment of a policy framework where banks should not only be incentivised to gradually "reduce their financed emissions", especially on emitting sectors where alignment targets are necessary, but also to "finance emissions reduction" (i.e., net-zero technologies and infrastructures)."*

# WORKING WITH OUR PEERS AND INDUSTRY TO DEVELOP COMMON STANDARDS



**HADJIRA HAMDAOUI**  
HEAD OF CLIMATE  
QUANTITATIVE  
STRATEGY TEAM

*"In the pursuit of a sustainable future,*

*it is imperative for banks to join forces with companies, uniting our financial and industrial innovation capabilities, to lead the way towards decarbonising our economy. In recognition of the pressing need for action, a shared vision and collaborative spirit will be the keys to our success in creating a greener, more sustainable world."*

Steering lending portfolios along trajectories compatible with the goals of the Paris Agreement requires methodologies and metrics. We were one of the first banks to join forces to work collectively on developing these methodologies.

Since 2018, we have contributed to the development of the PACTA methodology<sup>(1)</sup> and collaborated with BBVA, BNP Paribas, ING and Standard Chartered (also known as the Katowice Banks) and The 2° Investing Initiative (2DII)<sup>(2)</sup> on making this methodology applicable to banking portfolios and providing recommendations for improving it.

In 2019, Societe Generale announces it is one of the founding signatories to the **Poseidon Principles** in collaboration with the Global Maritime Forum, and in league with a significant number of the shipping industry's leading banks. The Poseidon Principles aim to promote a low carbon future for the global shipping industry integrating climate decision-making into portfolio management and lending decisions for ship financing.

In 2020, Societe Generale was the first European bank to join the **Hydrogen Council**, which brings together more than 120 members, all contributing to the roll-out of hydrogen as part of the energy transition. The bank aims to bring its expertise in innovative financing and energy advisory to help develop the "low carbon" hydrogen solutions of tomorrow.

**In 2021, we joined the Net-Zero Banking Alliance (NZBA) as a founding member.**

The Alliance unites banks around the objective of aligning their portfolios and activities with pathways consistent with a maximum temperature rise of 1.5 °C.

We actively participate in different working groups organised by the NZBA and GFANZ<sup>(2)</sup> with other banks.















We also joined several working groups gathering financial institutions and major players of the industries to combine our expertise and work collectively on climate-aligned finance frameworks

Similar to the Poseidon Principles, the work carried out by the working groups has resulted in the creation of several frameworks, of which we are a founding signatory:

- The Sustainable Steel Principles (2022);
- The Sustainable Aluminium Finance Framework (2023);
- The Pegasus Guidelines for the aviation sector (2024).

These frameworks are designed to help banks independently measure and disclose the emissions intensity and/or climate alignment of their lending portfolios compared to a 1.5°C scenario.

Benefitting from the close collaboration of the principal actors involved in each sector, we aim to help clients decarbonise their activities and properly address the specific challenges of their sectors.

2024		Founding member of the <b>Pegasus Guidelines</b> , the first voluntary climate-aligned finance framework for the aviation sector to enable banks to measure and disclose their aviation lending portfolios' emissions in a consistent and comprehensive manner
2023		Founding member of the <b>Sustainable Aluminium Finance Framework</b> , the first climate-aligned finance framework for the aluminium sector, designed to help banks align financing decisions with their own decarbonisation targets
2022		Founding signatory to sign the <b>Sustainable Steel Principles</b> , the first climate-aligned finance agreement for lenders to the steel industry
		Member of the <b>Science Based Targets Network for Climate and Nature</b>
2021		Founding member of the <b>UNEP-FI Net-Zero Banking Alliance</b> , committing to align its portfolios with trajectories aiming at <b>carbon neutrality by 2050</b>
2020		<b>First bank to join the Investor Group of the Hydrogen Council</b> , committing its expertise in innovative financing and energy advisory
		<b>PACTA for Banks</b> : joint publication of a methodology with the Katowice Banks
2019		<b>Founding bank for UN Principles for Responsible Banking</b> and member of the <b>Collective Commitment on Climate Action</b>
		Signatory of <b>Katowice Agreement</b> and pledge to align portfolio with Paris Agreement
		<b>Founding signatory of the Poseidon Principles</b> , aiming at decarbonising the shipping industry
2018		<b>First French bank to join the Climate Bond Initiative</b> Partnership programme
		Member of the <b>ICMA Green Bond Principles</b>
2001-2017		Founding member of the <b>Positive Impact Initiative</b> within the UNEP-FI
		Signatory of the <b>CDP, Equator Principles and the Soft Commodities Compact</b>

<sup>(1)</sup> PACTA (Paris Agreement Capital Transition Assessment) is a methodology developed by the 2° Investing Initiative (2DII) to help investors analyse the extent to which corporate capital expenditures and industrial assets behind financial instruments and portfolios in emissions-intensive industries are aligned with various climate scenarios. <sup>(2)</sup> GFANZ: Glasgow Financial Alliance for Net-Zero.

# TRANSFORMING TO SHIFT OUR BUSINESS MODEL



**ERIC BONNIN**  
GLOBAL HEAD OF  
SUSTAINABLE AND  
POSITIVE IMPACT  
FINANCE SOLUTIONS

*“The SHIFT programme that was launched*

*two years ago has allowed us to work jointly to put collective intelligence and cross sectorial expertise into motion to accompany our clients in driving and financing their transition. We continue to capitalise on our internal expertise and partner with transition and impact specialists to create a coordinated ecosystem across the bank that serves and accelerates our clients’ low-carbon transition and impact strategies.”*

**Societe Generale is launching a EUR 1bn Transition Investment Fund to be invested in debt and equity to support emerging players and new solutions**

with a positive impact component to foster a fair transition and contribute to the financing of the Sustainable Development Goals.

Supporting our clients through their transition strategy is a fundamental part of our banking business. To keep pace with our customers’ changing needs, **we are rethinking our business models** and integrating innovative solutions leveraging our ecosystem of stakeholders.

For our wholesale business, we have decided to **put collective intelligence on selected key topics to develop new advisory and financing approaches and to co-construct solutions with our clients.**

To support our clients’ transformation, more than **400 staff** from various key regions and business lines are working together on **11 strategic activities** articulated around three thematics to:

- **Create synergies and develop expertise;**
- **Onboard and engage staff on ESG challenges.**

## 1. STRATEGIC VALUE CHAINS

Using a cross-sectorial approach and life cycle analysis, we take a holistic view of our clients’ businesses:

1. Rail and road mobility
2. Air transportation
3. Maritime industries
4. Sustainable food & agribusiness

## 2. NEW BUSINESSES

We support emerging leaders and create new product offers for:

5. Emerging leaders
6. Impact strategies
7. Biodiversity, nature-based solutions and carbon credits

## 3. CROSS FERTILISATION

We share our knowhow and raise awareness as early movers on emerging technologies and markets:

8. Hydrogen
9. Circular economy
10. Decarbonisation solutions
11. Water

- **EUR 1bn** Societe Generale commitment  
**EUR 0.7bn** equity component  
**EUR 0.3bn** debt component for Energy Transition (launched in Q3-23)
- In partnership with **well-established managers of alternative investments** or standalone

### EUR 0.7bn Equity Investment Focus

#### Emerging Leaders of the energy transition

(low carbon solutions, renewables, carbon capture and storage, hydrogen...)

#### Investment in VC or Growth companies

**Nature-based solutions** with positive contributions to the protection and restoration of biodiversity

**Impact-driven investments contributing to the UN SDGs**



# FOSTER CLIENT ENGAGEMENT AND SUPPORT TRANSITION STRATEGIES

We engage with our clients to ensure their transition strategies are coherent with our own sectoral pathways.

Through client engagement, we:

- Exchange to better understand their climate transition strategies;
- Feed our assessment of climate-related risks and impacts for clients and understand their mitigation strategies;
- Structure and propose adequate and innovative financing, advisory and partnership solutions for driving client transformation.

Client engagement is even more important in a context where the risk and business profiles of corporates are evolving rapidly.

Identifying key risk drivers and opportunities requires co-construction with clients, expertise, continuous training and high involvement from our teams.

To foster client engagement, we capitalize on our internal expertise, put collective intelligence into motion and partner with transition and impact specialists to deliver constructive dialogue, adapted to each client's specificities.

We need to have top skills and tools to remain our clients' most relevant partners. Senior bankers and relationship managers have access to various resources to grow their expertise and better understand both the transformation challenges of the sectors they cover and the specific risks and opportunities for their clients.

## ■ Sectoral dynamics and challenges:

- **Sectoral packs:** online material and presentations explaining the main ESG trends of each sector and how the market may be driven due to ESG constraints or opportunities. Materials have been co-constructed by relationship managers and ESG experts;
- **Specific presentations on decarbonisation challenges and levers by sector;**
- **The Industry Climate Vulnerability Indicator (ICVI)**, developed by the Economic and Sector Studies Department, is a risk tool which enables bankers to understand the level of transition risk for a specific industry;
- **Webcast conferences called “Business hours”** where sectoral experts coming from businesses share their views on sector specific challenges and opportunities linked to transition. For Aviation, Shipping, Automotive, etc., each sector has been scrutinized, and outlooks from experts have been shared with the staff;
- **The Climate Energy Club:** a club with more than 700 members where analysis on the economic impact of climate and environmental issues on sectors and countries are shared through notes and conferences (an average of 180 participants per meeting). Topics include the financial needs for the EU, the US 2050 net zero transition and the IPCC report.

## ■ Clients' Sustainability profile and strategy:

- **The Corporate Climate Vulnerability Indicator (CCVI)**, developed by the Economic and Sector Studies Department, enables bankers to understand the level of transition risk of corporate clients;
- **The environmental and social analysis of corporate clients** enables bankers to understand clients' main environmental and social impacts and how they mitigate them. Our clients' alignment with Societe Generale's sectoral policies is also analyzed, leading to specific client discussions;
- **The Transition Opportunities Potential (“TOP”) tool, developed to assess client climate transition strategies.** The tool has been specifically adapted for each sector and is based on transparent methodology. It helps senior bankers and relationship managers structure and strengthen strategic discussions with clients and better support their transition strategies with adequate, innovative or sustainability-linked solutions.

To foster open dialogue and experience sharing, each year we organise an international broadcasted event: **the Positive Impact Week**, which hosts renowned guests who engage in insightful discussions on transition with Societe Generale's experts.

## OUR FLAGSHIP EVENT: THE POSITIVE IMPACT WEEK

For 8 years, Societe Generale has been holding an annual Positive Impact Week conference that gathers a large community of professionals, industry leaders and decision makers, who come together to delve deeply into actionable ideas capable of accelerating the transition.

This annual event allows us to gain valuable insights from renowned experts and industry leaders who are fostering positive change and enabling a faster transition.

The 2023 edition took place on November 27-28, online and in-person across selected locations, involving more than 80 speakers, mostly C-suite guests and international experts, discussing with Societe Generale specialists and top executives.

This year's programme focused on facilitating and accelerating **the deep transformation of industries, sectors, value chains, and investment.**

It covered a large spectrum of the transition & business transformation: electric mobility, critical minerals, circular economy, sustainable agriculture, aviation, emerging leaders, fair transition and much more...

Almost **650 clients** attended the **2022 edition** listening to more than **100 speakers** across **48 sessions** and **14 locations**.



EXPLORE  
SUSTAINABILITY  
FROM A WIDE  
PERSPECTIVE

**POSITIVE  
IMPACT.  
WEEK**  
NOVEMBER 27 TO  
DECEMBER 1<sup>st</sup>, 2023

# REDUCING THE GHG EMISSIONS FROM OUR OWN OPERATIONS

## Our objective is to reduce our internal carbon footprint by 50% between 2019 and 2030

As part of its CSR approach, Societe Generale has been working on reducing its carbon footprint for a number of years.

In 2021, the Group ramped its goals up a notch, announcing a target of a 50% reduction in its operational carbon emissions between 2019 and 2030, through measures focused on energy use relating to its premises, IT, air travel and car fleet. By the end of 2023, **the Group had achieved a 34% reduction as compared to its 2019 carbon footprint** and was thus on track to meet this target.

In 2023, the BUs and SUs took charge of implementing operational measures aimed at reducing greenhouse gas emissions.

- The main areas identified as offering potential for emissions reductions were as follows:
- **Air transport and car fleet:** by reducing business travel (i.e., travelling less) and making it greener (i.e., travelling leaner, for example by switching to electric vehicles for the car fleet or opting for more efficient routes/airlines);
  - **IT systems:** the Group keeps a very sharp eye on its IT carbon footprint and has a special programme in place to reduce it – CSR by IT;
  - **Real estate:** by using more renewable energies and benefiting from the reduction in consumption made possible by new ways of working post-pandemic (more remote working, smaller building footprint for the Group).

## Our employees are actors of our decarbonisation

Societe Generale encourages its employees to come up with innovative environmental initiatives, awarding grants funded by the Group's internal carbon tax since 2011.

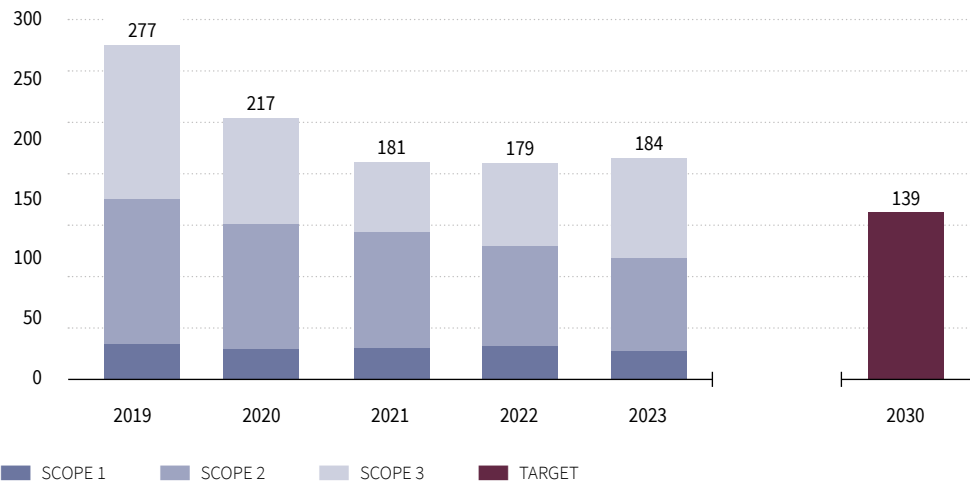
Each business line and functional division pays an internal carbon tax based on their carbon footprint. The funds collected are then redistributed among Group entities through its Energy and Environmental Efficiency Awards. These grants are spent on initiatives that have not only reduced the Group's environmental impact but also generated financial savings.

Through this internal carbon tax (EUR 25/tCO<sub>2</sub> eq. since 2022), the Group hopes to encourage greener habits and efforts to make its buildings more efficient, stimulate low-carbon investment, identify and seize low-carbon opportunities and reduce the environmental impact of its sourcing.

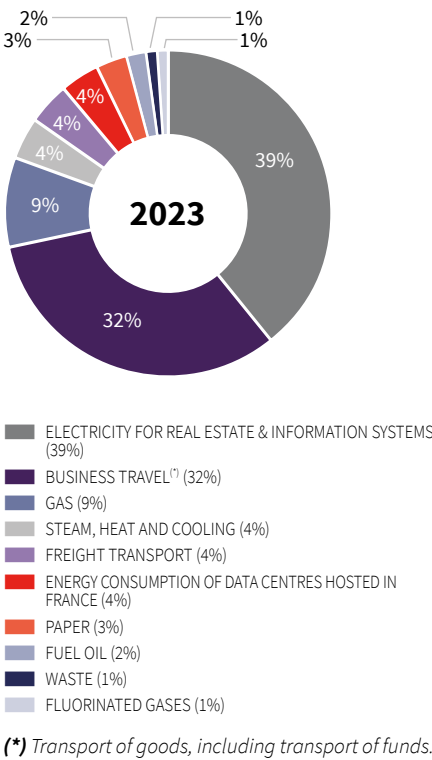
Initiatives in real estate, IT, mobility and the circular economy are awarded by the Energy and Environmental Efficiency Awards and since 2023 water and catering have also been included.

The 2023 awards led to the identification of efficiency opportunities giving total savings of 4,900 tonnes of CO<sub>2</sub>, i.e. 55,000 tonnes of CO<sub>2</sub> since the initiative was launched.

### GROUP CARBON FOOTPRINT (THOUSANDS OF TCO<sub>2</sub>EQ.)



### BREAKDOWN OF THE GROUP'S DIRECT CO<sub>2</sub> EMISSIONS IN 2023



The historical data presented are recalculated according to the location-based method.

Note: there is some data uncertainty in the indicators reported for the Group's direct CO<sub>2</sub> emissions. The limits of the associated data collection, verification and reporting methods suggest that there is room for improvement in terms of data quality.

**Scope 1** covers direct emissions related to energy consumption and fugitive emissions of fluorinated gases.

**Scope 2** covers indirect emissions related to energy consumption (external electricity, steam and chilled water).

**Scope 3** covers GHG emissions from all office paper consumption, business travel, waste, transport of goods and energy consumption of data centres hosted since 2017.

# METHODOLOGIES AND SCENARIOS SUPPORTING SOCIETE GENERALE TARGET SETTING



**MICHALA MARCUSSEN**  
GROUP CHIEF  
ECONOMIST AND  
HEAD OF ECONOMIC  
AND SECTOR STUDIES

*“More than just informing targets, scenarios help us work with our clients to set in motion tangible actions on the road to net zero”*

## Societe Generale’s major steps in fighting climate change

Since 2018, we have contributed to the development of the PACTA methodology<sup>(1)</sup> and collaborated with BBVA, BNP Paribas, ING and Standard Chartered (also known as the Katowice Banks) and the 2° Investing Initiative<sup>(1)</sup> (2DII) to make the PACTA methodology applicable to banking portfolios, providing recommendations for improving the methodology.

Societe Generale joined NZBA in 2021 as founding member. The Net-Zero Banking Alliance (NZBA) and its members are committed to aligning the banking sector with the Paris Agreement climate goals. These goals include the strengthening of the global response to the threat of climate change through the pursuit of efforts to limit the temperature increase to 1.5°C. Financial flows will play a key role.

The Group has developed a strategic approach to climate change based on three pillars: addressing risks induced by climate change, managing the impact of its activities on climate, and supporting clients in their environmental transition, notably by developing financial and advisory solutions aligned to this objective.

## The Net Zero concept and the temperature objective

Carbon Neutrality, or Net Zero, is defined at a global level as a balance between emissions and removals. According to the IPCC, “Net zero carbon dioxide (CO<sub>2</sub>) emissions are achieved when anthropogenic CO<sub>2</sub> emissions are balanced globally by anthropogenic CO<sub>2</sub> removals over a specified period”.

The Paris Agreement introduces the link between a temperature objective and the Carbon Neutrality target: “in order to achieve the long-term temperature goal [well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C], [...] so as to achieve a balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases in the second half of this century”.

The objective, as part of the Net-Zero Banking Alliance, is to combine a Carbon Neutrality goal for CO<sub>2</sub> emissions at a global level, consistent with a maximum temperature rise of 1.5°C above pre-industrial levels by 2100.

## Climate scenarios are required to implement these objectives

Performing an exercise of forward-looking target setting requires a projection of decarbonisation pathways laid out in temperature scenarios. These scenarios provide insights on the potential impacts of different policy choices, technological developments and behavioural changes on greenhouse gas emissions while respecting global carbon budgets. Their aim is to indicate potential pathways for transforming the global energy system to mitigate climate change and achieve sustainable, low-carbon economies.

## The IEA Net Zero Emissions Scenario by 2050 stands out as a reference scenario to these ends

The IEA Net Zero Emissions by 2050 Scenario (NZE Scenario) outlines a pathway to achieve global net-zero greenhouse gas emissions by 2050. This scenario is derived drawing on an energy model, as the energy sector is a major contributor to global greenhouse gas emissions across all sectors of the economy. The IEA NZE Scenario outlines one possible pathway, detailing the actions and timelines that could be engaged by different sectors and stakeholders to achieve global net-zero CO<sub>2</sub> emissions from energy combustion and industrial processes by 2050.

It also considers other energy-related sustainable development goals, such as energy access for all and air pollution.

The IEA NZE Scenario respects a carbon budget (or cumulative future emissions) associated with a temperature increase limited to 1.5°C by 2100, with a 50% probability and makes it one of the most prominent scenarios used as part of the alignment methodologies for setting and monitoring specific targets.

Yet, in some instances, the IEA NZE Scenario lacks granularity which is key when setting targets and translating those targets into concrete actions.

Other sector-specific and reliable scenarios exist can then be drawn upon and targets are set using the most relevant scenario for each specific sector.

**Societe Generale incorporates the most robust frameworks for carbon accounting, target setting, alignment methodologies and disclosures.**



<sup>(1)</sup> PACTA (Paris Agreement Capital Transition Assessment) is a methodology developed by the 2° Investing Initiative (2DII) to help investors analyse the extent to which corporate capital expenditures and industrial assets behind financial instruments and portfolios in emissions-intensive industries are aligned with various climate scenarios.





## KEY CROSS-SECTORAL CONCEPTS

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Our global economy is fuelled by energy, and acting on energy transition is a priority	11
A system-based approach is needed to transition to a Net-Zero economy	12
All sectors are intertwined, and so are their transition paths	13
To engage on decarbonisation pathways, Corporates can act on six transition levers	14
Transversal low-carbon solutions will help to accelerate climate transition	15
Integrating new challenges raised by the energy transition	16

# OUR GLOBAL ECONOMY IS FUELLED BY ENERGY, AND ACTING ON ENERGY TRANSITION IS A PRIORITY

We are a leading energy bank embracing the broad and deep transformation of our energy systems to drive our transition.

## Energy use flows through all sectors

The energy sector is the main source of greenhouse gas emissions. Energy-related CO<sub>2</sub> emissions account for around 75% of global CO<sub>2</sub> emissions. However, most of these emissions do not come from the upstream segments of the energy value chain, but from energy consumption in the various economic sectors: industry, transport and real estate. Some primary energy sources, like natural gas, are also used as raw materials in some sectors, such as hydrogen or plastic production. All economic sectors depend on energy sources either as a direct combustion fuel, for heat or for electricity production. As energy is essential to all economic activities, acting on energy is the most powerful decarbonisation lever for all sectors.

## The transformation of our energy system will drive decarbonisation

The energy sector is undergoing a transformation towards a more decentralised and lower-carbon model. Distributed generation has been made possible by technology developments in renewable energy, low-carbon vehicles and batteries. The IEA projects 38% of renewables in the power mix in 2027<sup>(1)</sup>. Solar PV and wind costs are becoming more competitive with fossil

fuels each year. They decreased by at least 55% between 2015 and 2022 depending on the technology whereas the energy crisis highlighted the volatility of fossil fuels-based generation costs which spiked in 2022<sup>(2)</sup>. Today, companies across sectors can produce low-carbon energy for themselves or others, thus contributing to each other's decarbonisation. This decentralisation is offering more opportunities to source competitive low-carbon energies.

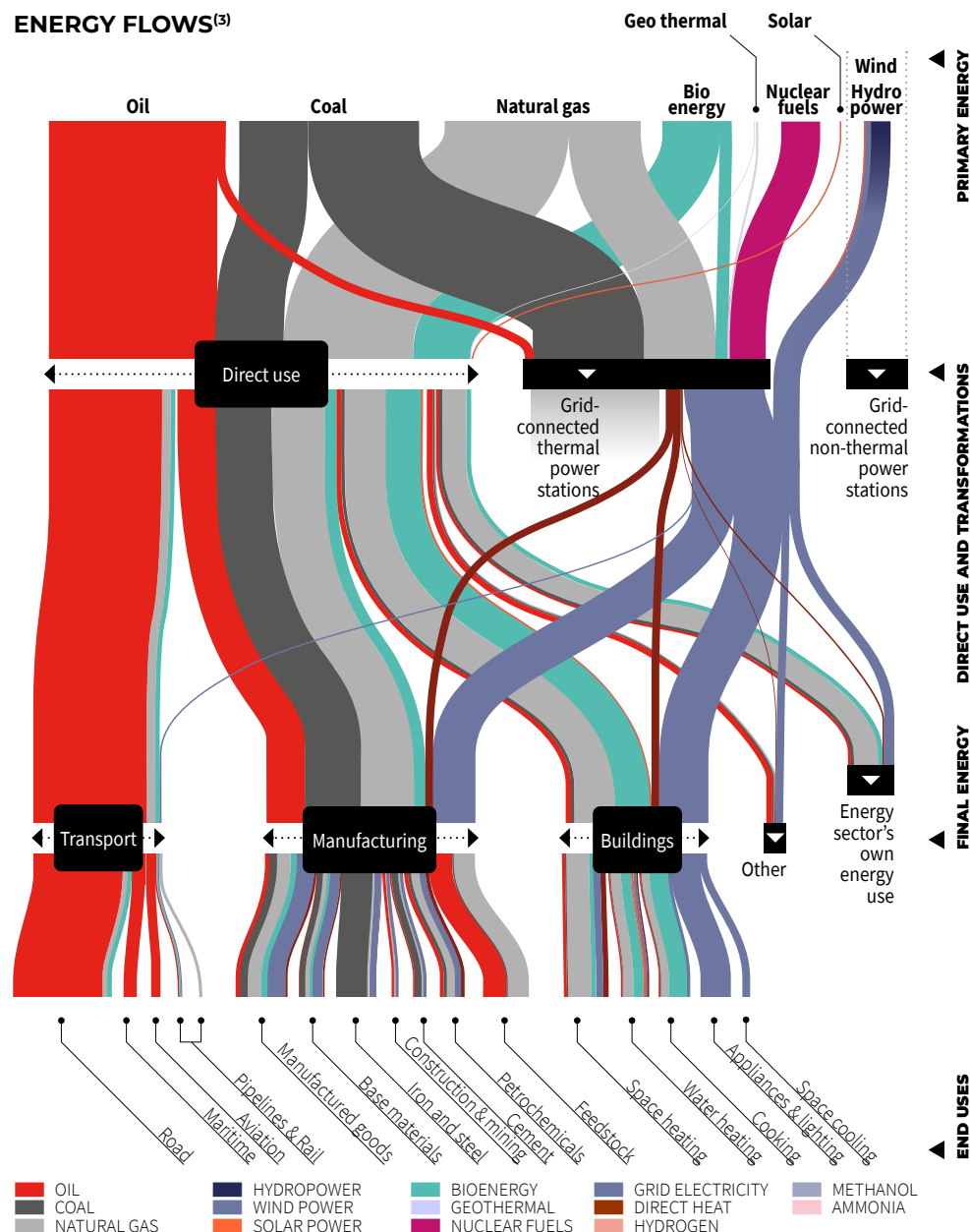
## As a leading energy bank, Societe Generale has built unique expertise and a track record on energy systems across its different business units

**Production** – We support the deployment of renewable power assets across regions and innovate low-carbon fuels like hydrogen.

**Distribution** – Infrastructure being the backbone of the energy transition, we finance the reinforcement of power grids, and leverage our different business lines to foster the development of new energy infrastructure like EV recharging networks.

**Consumption** – We develop innovative financing solutions to decarbonise the energy supply of our customers, such as solar rooftop assets for corporate clients, energy retrofit for real estate players.

ENERGY FLOWS<sup>(3)</sup>



(1) IEA, Renewables 2022. (2) IRENA, Renewable Power Generation Costs in 2022. (3) 2020.

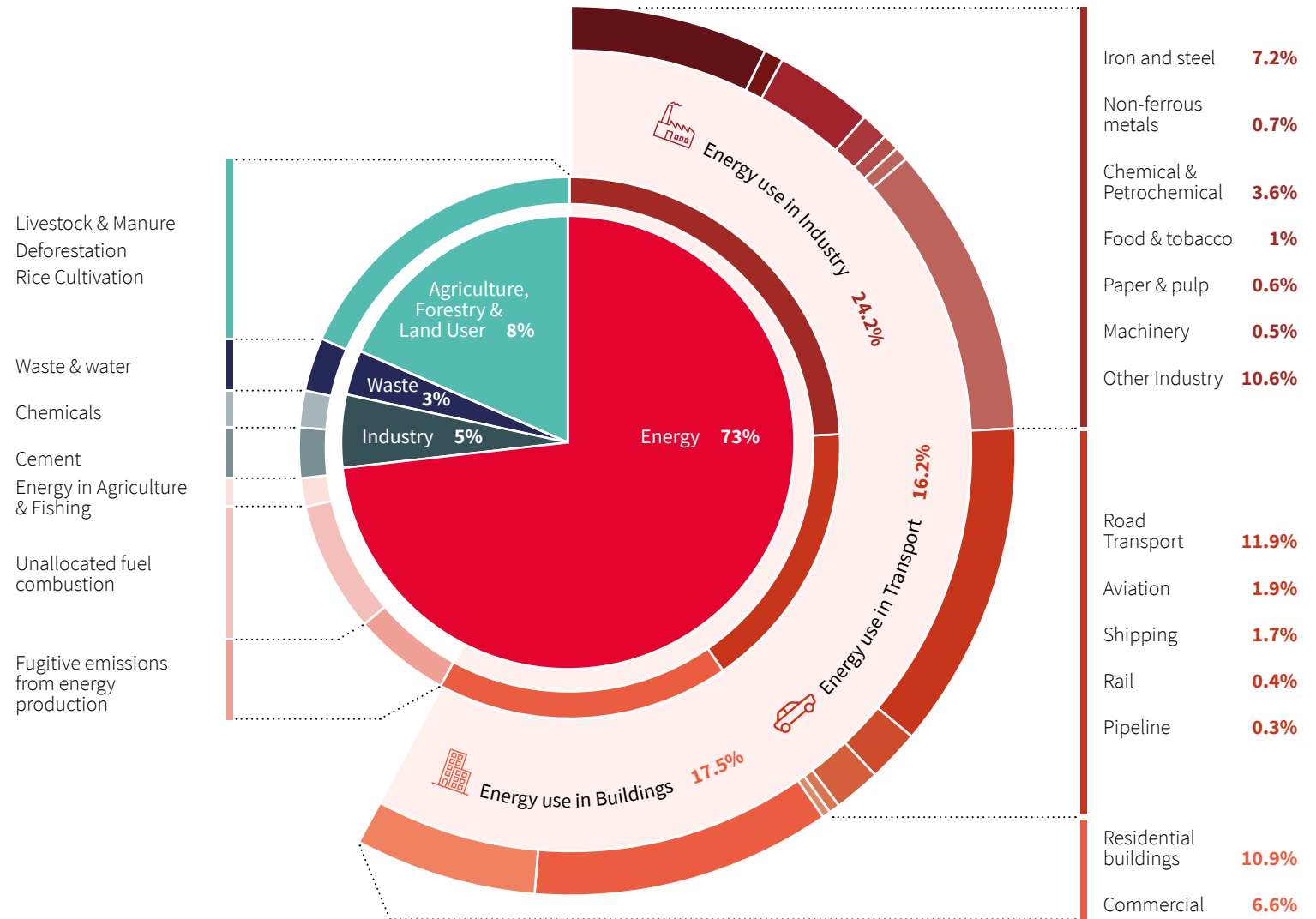


# A SYSTEM-BASED APPROACH IS NEEDED TO TRANSITION TO A NET-ZERO ECONOMY

Energy systems are at the core of our economies. Building sustainable energy models will be key to enabling a global transition potential.

## Almost 75% of global CO<sub>2</sub> emissions are related to energy.

Energy-related CO<sub>2</sub> emissions reached 36.8 Gt in 2022<sup>(1)</sup>. As most CO<sub>2</sub> emissions come from the use of fossil energy sources, which is spread across sectors, they are distributed across the different value chains consuming these energy sources.



(1) IEA, CO<sub>2</sub> emissions in 2022. Source: <https://ourworldindata.org/ghg-emissions-by-sector>



# ALL SECTORS ARE INTERTWINED, AND SO ARE THEIR TRANSITION PATHS

We focus our cross-industry expertise on decarbonisation and use an integrated approach when working with our clients on their transition.

## All economic sectors are interconnected and interdependent.

They provide services and products to one another, share challenges but also solutions. For those reasons, it is important to look at the economy as an intricate multidimensional system, understand each sector's dependencies before setting associated targets.

As illustrated in the figure opposite, materials are exchanged across all the economic sectors. No industry is isolated but rather all sectors are pieces of larger value chains.

The primary economic sector provides raw materials to both industry and utility companies who convert resources into final goods and commodities, followed by the tertiary sector of the economy offering services.

But all those sectors are also dependent on each other from the bottom to the top: the utility sector manages everyone's waste, industry provides the extractive industry with equipment, and those upstream sectors need transportation, buildings and financial services.

A value chain-driven approach highlights the potential transition nodes (hard-to-abate emissions, potential negative impacts of transition on biodiversity...) that need to be addressed considering this system as a whole.

Their transition paths are equally intertwined.

As an example, how can we imagine the decarbonisation of the telecommunications and electronics sectors without the transition of

the mining sector which supplies them critical minerals and drives innovation in recycling?

## We foster a transversal and cross-sectoral approach in our organisation.

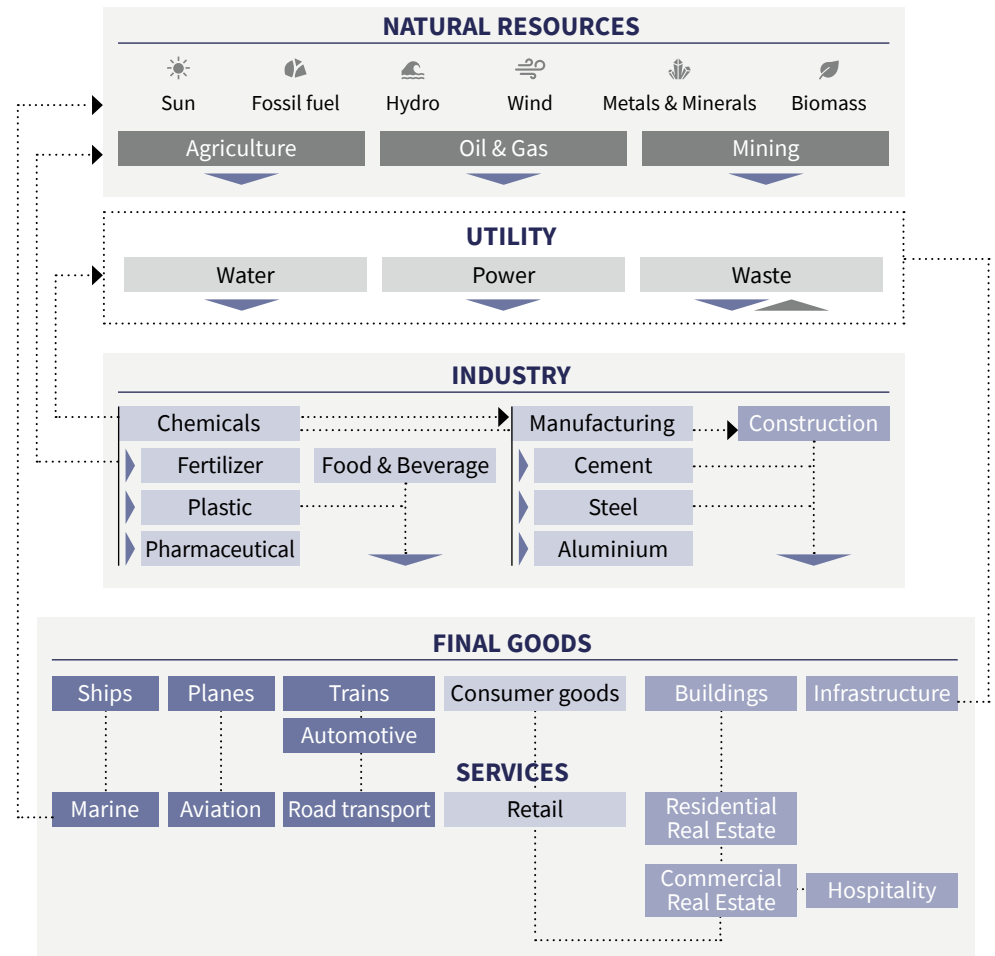
At Societe Generale, we are convinced that we cannot help our clients decarbonise – and transition our business activities – without embracing this holistic perspective. In 2021, Societe Generale launched a transformation program, “the Shift” (see Strategy, p. 27) to reshape its organisation and steer its business efforts to better understand the transition of such value chains. Multiple cross-region and cross-business lines workstreams were launched to cover strategic value chains, transversal technologies and new businesses.

## Carbon emissions from one sector impact the carbon footprint of all other sectors in its value chain.

Using a value chain approach ensures that emissions reduction efforts are not limited to the own activity of a company (scopes 1 & 2) but extend to the entire life-cycle of a product (scope 3), upstream to downstream. As each company's scopes 1 & 2 are another company's scope 3, net zero can only be reached if everyone plays their part.<sup>(1)</sup>

Adopting a value chain approach also ensures that efforts to reduce emissions in one sector do not lead to increased emissions in another.

## MATERIAL FLOWS ACROSS THE ECONOMIC SECTORS



All stakeholders must be aligned and incentivised to contribute to decarbonisation efforts. As an example, our shipping teams explore the transition of the entire shipping

value chain, where port managers, fuel suppliers (energy companies) and innovative digital companies contribute to it.

(1) GHG Protocol scopes definition to be found in Appendix.

# TO ENGAGE ON DECARBONISATION PATHWAYS, CORPORATES CAN ACT ON SIX TRANSITION LEVERS

We support our clients in the definition of the most ambitious and realistic decarbonisation pathways considering sectoral specificities.



## Sobriety and circularity



Optimising material uses and promoting reuse/recycling will be a key decarbonisation lever for hard-to-abate sectors. Multiple environmental and social elements call for more circularity and lower primary material consumption. Customers behaviour change can be a driver for sobriety (e.g. preference for train over plane, second-hand fashion market), and some corporates develop service-based business models to adapt to such change.

## Energy efficiency



Energy efficiency measures can be implemented at scale quite quickly in all sectors. Indeed, most technologies already exist (e.g. more efficient electrical appliances) and digital technologies (e.g. sensors) can foster their development.

Against a backdrop of rising energy prices, these energy efficiency measures enable companies to control their costs and become more competitive.

## Fuel switch



Decarbonising the energy supply of all economic sectors using renewable fuels, gases and electricity represents a relatively easy decarbonisation lever for most companies.

This is particularly true for electricity, given the cost competitiveness of renewable energy technologies. Biofuels are alternatives for transportation and biogas can replace coal and natural gas in manufacturing sectors.

## Carbon Capture, Usage & Storage



CCUS technologies are a relevant decarbonisation technology for some hard-to-abate sectors with high emissions from their industrial processes.

CCUS technologies are not commercially available today and scenarios forecast a global scale up of these technologies from 2030 onwards.

## Diversification



Diversification refers to the development of new business activities (products, services) with a lower carbon footprint and the development of solutions to decarbonise other sectors. It is relevant to most sectors, as their transition will not take place without an overhaul of their business activities. Automakers involved in electric vehicle (EV) manufacturing and the deployment of EV recharging infrastructure are good examples of such a strategy.

## Exit and closure



The closure of emissive activities/assets will be needed in sectors that are not compatible with climate transition scenarios.

Some companies can decide to exit some markets while developing low-carbon alternatives in parallel (e.g. coal phase out and renewable energy development in the power sector) and considering the social implications of such actions (e.g. employee reskilling).

# TRANSVERSAL LOW-CARBON SOLUTIONS WILL HELP TO ACCELERATE CLIMATE TRANSITION

Transversal low-carbon and carbon removal solutions need to develop at scale to reach net-zero targets even in hard-to-abate sectors.

## Energy efficiency

Energy efficiency measures consist of reducing the consumption of energy to provide the same service/ product: more energy efficient equipment, improved thermal insulation, etc.

Energy efficiency is called the 'first fuel' of the energy transition, being the quickest and most cost-effective CO<sub>2</sub> mitigation option – and helping users reduce their energy bills and strengthening energy security.

It is the largest single measure to avoid energy demand in the IEA NZE Scenario by 2050.

## Biofuels/ E-Fuels

Biofuels and e-fuels are particularly important to decarbonise heavy mobility and the industry.

Biofuels are made from biomass or organic waste. They include ethanol, biodiesel or biogas.

E-fuels, also known as synthetic fuels, are made from low-carbon hydrogen and captured carbon dioxide.

They include e-methane, e-kerosene and e-methanol. Biofuels production needs to reach over 10 EJ by 2030 in the IEA NZE scenario, 40% of which will have to be from waste and non-food crops.

## Low-Carbon Hydrogen (H<sub>2</sub>)

Over 99% of the current hydrogen production comes from natural gas ('grey hydrogen'). Several low-carbon production pathways are being developed: water electrolysis with renewable power ('green'), natural gas reforming with CCUS ('blue').

Low-carbon H<sub>2</sub> can replace fossil fuels in heavy industry and transportation (heavy truck, shipping) and offer energy storage capacity to power grid.

Scaling-up low-carbon H<sub>2</sub> requires huge renewable power capacities, the development of CCUS technologies and innovation across industry/ sector applications.

## Nature Based Solutions

Nature Based Solutions (NBS) are actions contributing to the sequestration of carbon via natural reactions.

They include reforestation, regenerative agriculture, mangrove protection, and many more.

NBS offer other benefits than just removing carbon, they contribute to biodiversity conservation, protection against natural disasters or economic development.

NBS projects are cited in different climate transition scenarios, including in the IEA scenarios, which include them in the carbon removal approaches.

## Carbon capture, Utilisation & Storage (CCUS)

CCUS encompass technologies used to capture CO<sub>2</sub> from industrial fumes and either store it underground or use it as feedstock.

The IEA NZE scenario requires 1.2 Gt CO<sub>2</sub> per year to be sequestered. Around 40 CCUS commercial facilities are already in operation<sup>(1)</sup>.

Over 500 projects are in various stages of development across the CCUS value chain, but the 50 new capture facilities announced for 2030 will only sequester 125 MtCO<sub>2</sub> per year.

## Transversal decarbonisation solutions have to be prioritised for the harder-to-abate sectors.

All sectors are different and have specific characteristics and requirements that affect the suitability of certain decarbonisation solutions. For example, some industrial sectors involve high-temperature processes that may

necessitate the use of hydrogen instead of solar or geothermal heat. Others, like cement, have intrinsic carbon emissions linked to industrial processes with limited to no alternatives. CCUS technologies will be a necessity for them.

(1) [IEA, Tracking clean energy progress 2023.](#)



# INTEGRATING NEW CHALLENGES RAISED BY THE ENERGY TRANSITION

The deployment of low-carbon technology necessitates new materials to redesign global supply chains. This is particularly meaningful for metals and we integrate these challenges into our energy transition approach.

## Being aware of the global manufacturing challenges.

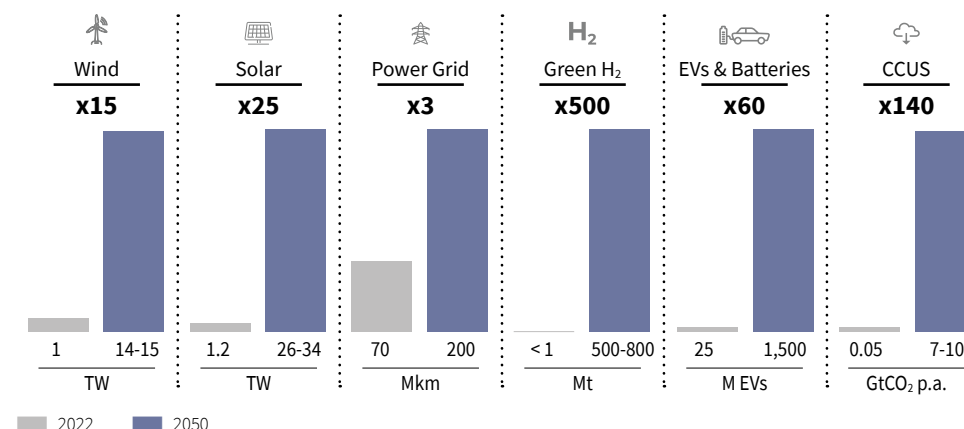
Low-carbon technologies rely on critical materials and the development of manufacturing supply chains enabling their global deployment. The resources and minerals required vary depending on the technology (e.g. copper and aluminium for electricity networks and electricity-related technologies, rare earths for wind turbines and EV motors).

The transition to clean energy systems is creating a surge in demand for these minerals, with potential challenges due to limited access. Critical material reserves and clean energy production capacities are concentrated in specific geographic areas<sup>(1)</sup>. This creates a risk of potential soaring of material prices, competition between clean energy systems and global supply chain disruptions. Clean energy transition challenges lie in the ability to ramp up supply and develop sustainable manufacturing chains to establish a reliable system able to meet the demands of the energy transition<sup>(2)</sup>.

## Supporting the development of clean energy supply chains.

Being a leading bank for metals, we grasp the criticality of developing sustainable and reliable supply chains for low-carbon technologies. We support our mining clients in developing their activities by offering innovative financing products.

## SCALE-UP OF CLEAN ENERGY TECHNOLOGIES NEEDED TO ACHIEVE NET-ZERO EMISSIONS BY 2050 ACCORDING TO THE ENERGY TRANSITION COMMISSION<sup>(3)</sup>



## CRITICAL MINERAL NEEDS FOR CLEAN ENERGY TECHNOLOGIES<sup>(4)</sup>

	Copper	Cobalt	Nickel	Lithium	Rare earths	Zinc	PGM <sup>(5)</sup>	Aluminium
Solar PV	●	●	●	●	●	●	●	●
Wind	●	●	●	●	●	●	●	●
Hydro	●	●	●	●	●	●	●	●
Electricity networks	●	●	●	●	●	●	●	●
Electric vehicles	●	●	●	●	●	●	●	●
Battery storage	●	●	●	●	●	●	●	●
Hydrogen	●	●	●	●	●	●	●	●

● High need    ● Moderate need    ● Low need

(1) IEA, *Special report on Solar PV global supply chain*, 2022.

(2) IRENA, *Critical materials for the energy transition: Rare earth elements*, 2022.

(3) Energy Transition Commission, *Material and Resource Requirements for the Energy Transition*, 2023.

(4) IEA, *Mineral requirements for clean energy transition*, 2021.

(5) PGM: Platinum Group Metals.



## OUR APPROACH SECTOR BY SECTOR

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Alignment approach to progressively align our credit portfolios with trajectories compatible with a 1.5°C scenario	18
Climate alignment dashboard: overview of targets set	19-22
Financed emissions dashboard: overview by sector	23-24

# ALIGNMENT APPROACH TO PROGRESSIVELY ALIGN OUR CREDIT PORTFOLIOS WITH TRAJECTORIES COMPATIBLE WITH A 1.5°C SCENARIO

## ALIGNMENT METHODOLOGY IN 5 STEPS

1. Baseline “Where are we Today?”	2. Decide “Where we need to be”	3. Plan “How we get there”	4. Report & Communicate	5. Operationalise Net Zero
<p><b>Identification of climate relevant exposure</b> across sectors and geographies.</p> <p>Assessment and benchmarking of exposure to high carbon intensity sectors.</p> <p><b>Measurement of emissions on a given sector</b> – baselining.</p>	<p>Agreement and <b>articulation of a level of ambition</b> to pursue (e.g. ‘Net Zero Scenario’).</p> <p>Building of sector-specific glide-paths to measure emissions against targets.</p> <p>Definition of a momentum case for key sector and a target pathway that meets the level of ambition.</p>	<p>Identify effective levers to achieve sector targets and determine their impact on emissions and financials.</p> <p>Definition of the use and ambition of strategies such as engagement with companies, exits, offsets and use of green financing.</p>	<p>Implementation of strategies and tools to effectively <b>develop transparency and promote comparable and meaningful communication; comply with regulatory disclosure requirements.</b></p> <p>Adhesion to standards for reporting consistently and transparently.</p>	<p>Engage with clients to capture green opportunities, support transition and potentially redeploy capital.</p> <p><b>Embedding implications of net zero into the organisation.</b></p> <p>Operationalise steering tools and equip senior management.</p>

# CLIMATE ALIGNMENT DASHBOARD: OVERVIEW OF TARGETS SET

## ALIGNING OUR PORTFOLIOS AND ACTIVITIES WITH PATHWAYS CONSISTENT WITH A MAXIMUM TEMPERATURE RISE OF 1.5 °C

Prior to joining the Net-Zero Banking Alliance in April 2021, Societe Generale started working on aligning its credit portfolios with the goals of the Paris Agreement and contributed (with other banks) to building the PACTA methodology which helps banks steer their lending portfolios.



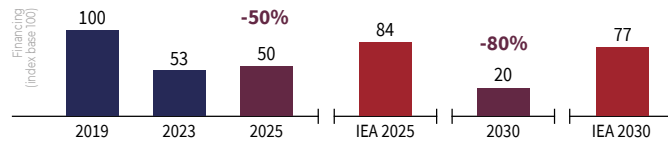


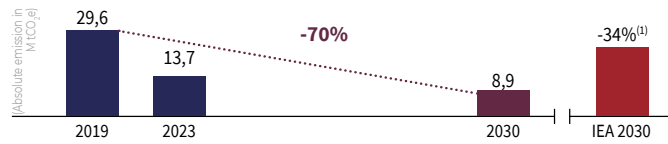


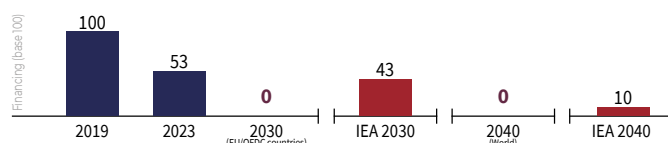


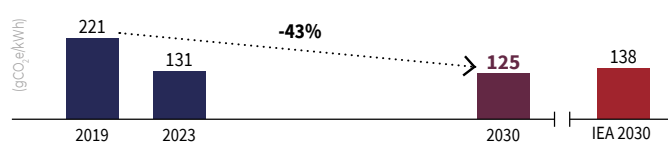
The PACTA methodology identifies “priority sectors” to align, and within those sectors, it identifies the parts of the value chains (called “segments”) to be addressed first (cf. below).

Societe Generale’s alignment approach has focused on defining strategies for the most emissive sectors following the PACTA methodology and NZBA guidelines.

The table below presents the targets set by Societe Generale for ten sectors: Oil & Gas, Thermal Coal, Power, Commercial Real Estate, Cement, Steel, Aluminium, Automotive, Shipping, and Aviation.

Target dates (2025, 2030) refer to the end of the target year (e.g., 31<sup>st</sup> of December 2030).

The alignment approach is detailed in the upcoming pages for each of those 10 sectors as well as for Agriculture and Residential Real Estate for which no emissions-based target have been set to date.

SECTOR BOUNDARY	METRICS	EMISSIONS SCOPE	SCENARIO	BASELINE & TARGET
 <b>Oil &amp; Gas</b> 	Financing (index base 100)	N/A	IEA's NZE Scenario	
 <b>Oil &amp; Gas</b> 	Absolute emissions in Mt CO <sub>2</sub> e	Scopes 1, 2 & 3 for Upstream Scopes 1 & 2 for Mid- and downstream	IEA's NZE Scenario	
 <b>Thermal Coal</b> 	Financing (index base 100)	N/A	IEA's NZE Scenario	
 <b>Power</b> 	gCO <sub>2</sub> e/kWh	Scopes 1 & 2	IEA's NZE Scenario	

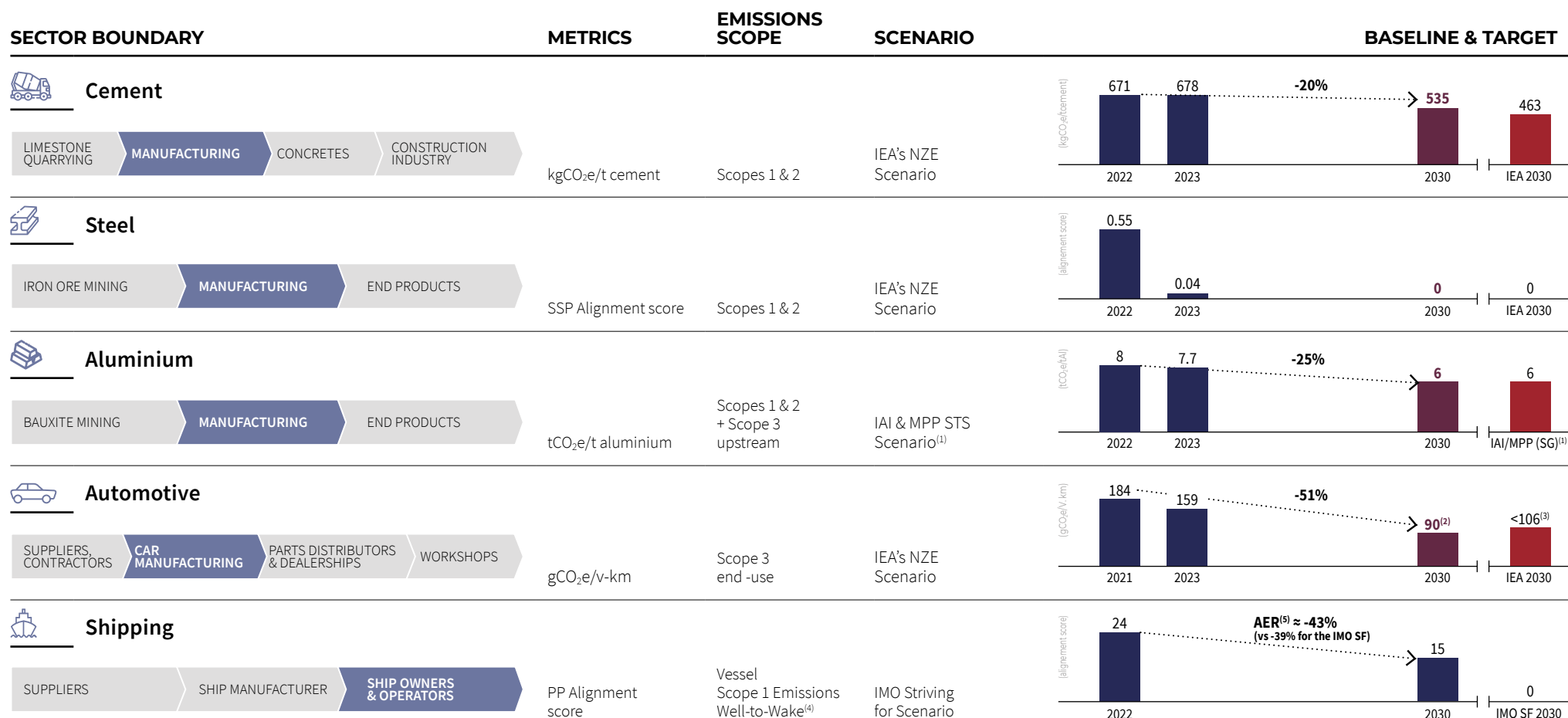
TARGETS ARE DISPLAYED IN PURPLE

(1) In the IEA NZE Scenario, the absolute emissions fall by 34% between 2019 and 2030.



# CLIMATE ALIGNMENT DASHBOARD: OVERVIEW OF TARGETS SET

## ALIGNING OUR PORTFOLIOS AND ACTIVITIES WITH PATHWAYS CONSISTENT WITH A MAXIMUM TEMPERATURE RISE OF 1.5 °C

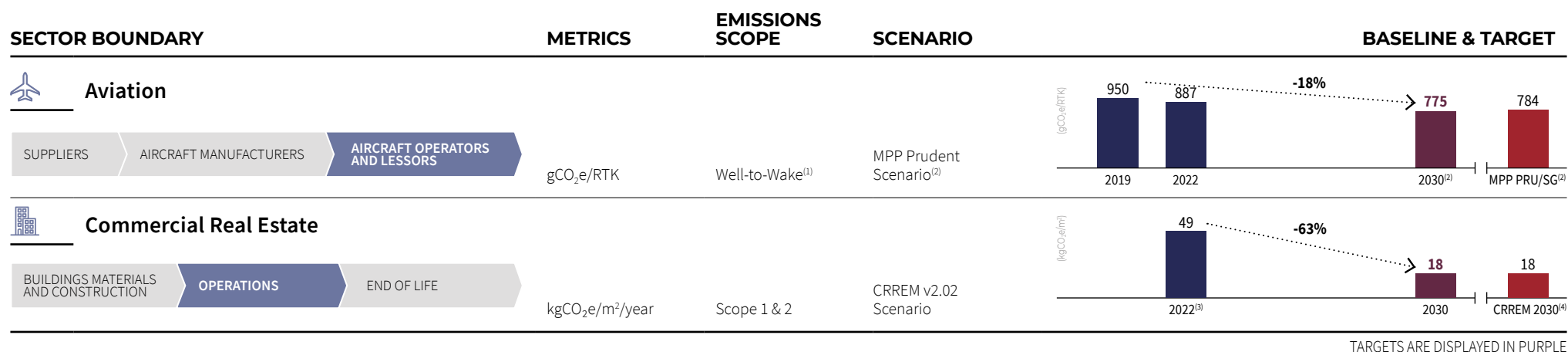


TARGETS ARE DISPLAYED IN PURPLE

**(1)** The combined International Aluminium Institute - Mission Possible Partnership Scenario is a 1.5°C scenario used by the Sustainable Aluminium Finance Framework. **(2)** Societe Generale's target is based on average intensity of new cars sold for a given year. **(3)** The IEA scenario is based on the stock of vehicles on the road. **(4)** Emissions generated during: (i) operational activities (i.e., Scope 1, or tank-to-wake emissions for shipowners) from fuel combustion on board of a vessel (ii) upstream activities (i.e., Scope 3 category 3, or well-to-tank emissions for shipowners) including extraction, cultivation, production, processing, storage, transport and bunkering of fuels. **(5)** The target translates into an AER reduction of 43% in 2030 vs 2022 (vs. 39% industry).

# CLIMATE ALIGNMENT DASHBOARD: OVERVIEW OF TARGETS SET

## ALIGNING OUR PORTFOLIOS AND ACTIVITIES WITH PATHWAYS CONSISTENT WITH A MAXIMUM TEMPERATURE RISE OF 1.5 °C

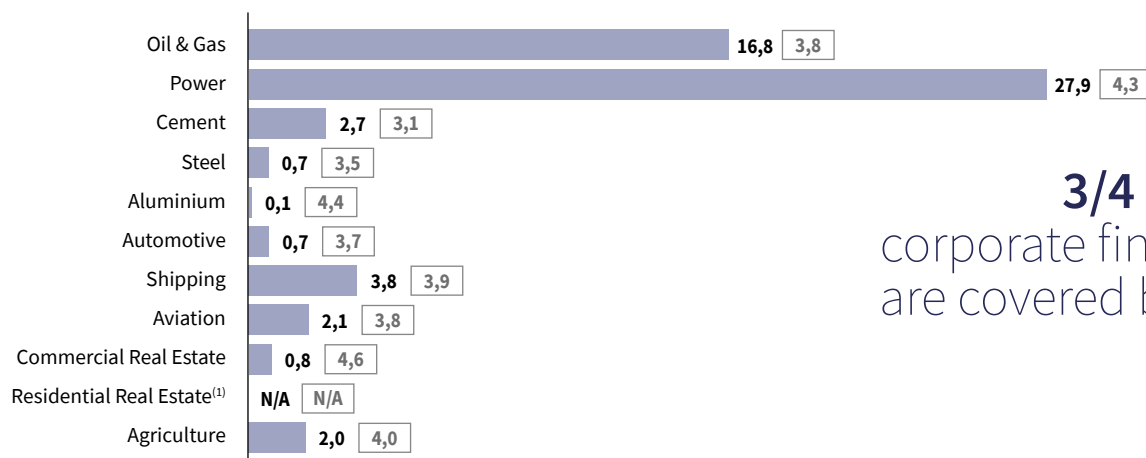


**(1)** Emissions generated during: (i) operational activities (i.e., Scope 1, or tank-to-wake emissions for aircraft owners) from jet fuel combustion and (ii) upstream activities (i.e., Scope 3 category 3, or well-to-tank emissions for aircraft owners) including extraction, cultivation, production, processing, storage, transport and bunkering of jet fuels. **(2)** 1.5°C scenario based on Mission Possible Partnership Prudent trajectory ("MPP PRU") adjusted with SG's current portfolio composition. **(3)** 2022 baseline was estimated based on proxies applied to Societe Generale portfolio distribution by country and asset type. **(4)** 2030 target is reliant on portfolio mix and shall be adapted accordingly with the corresponding CRREM targets in case of change of the mix. Based on the current portfolio mix (asset type and country), it translates into a target of 18 kgCO<sub>2</sub>e/m<sup>2</sup>/year.

# FINANCED EMISSIONS: OVERVIEW BY SECTOR

The calculation of Societe Generale's financed emissions covers the full value chain of each sector. In comparison, decarbonization targets only cover the most emissive segments.

## SCOPE 1 & 2 FINANCED EMISSIONS ASSOCIATED WITH THE VALUE CHAIN (MtCO<sub>2</sub>e, Q4 2023)



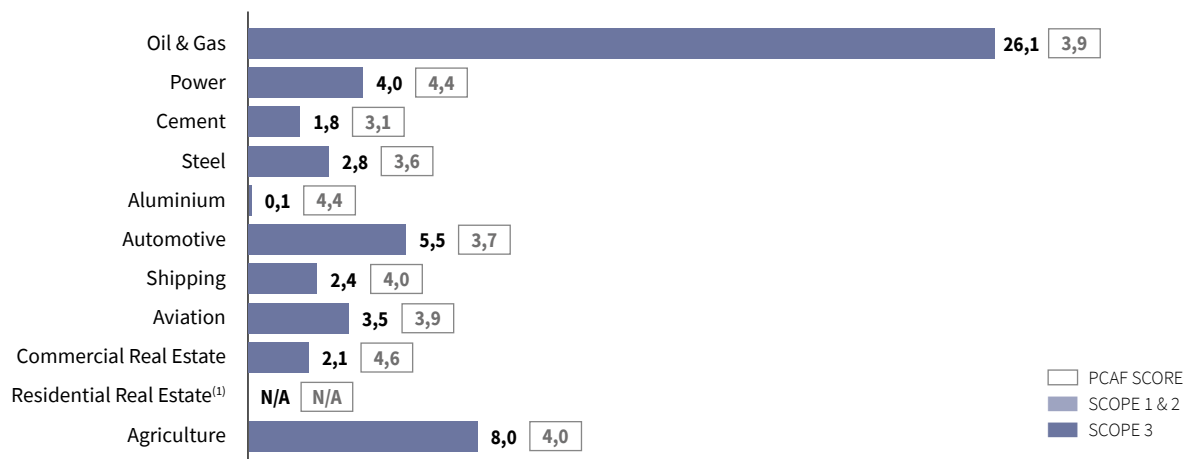
**3/4** of our Scope 1&2 corporate financed emissions are covered by NZBA targets<sup>(2)</sup>

Financed Emissions are calculated according to the PCAF methodology whereby Societe Generale accounts for a portion of the annual emissions of its clients by determining the ratio between the outstanding debt and the total equity and debt of the client.

The PCAF Score measures the data quality used to calculate Financed Emissions. When available, data reported by clients or collected via Bloomberg are used (PCAF Score of 1 for verified data or 2 for unverified data).

Otherwise, we have used revenue-based or asset-based emissions factors to estimate clients' emissions, with PCAF Scores of 4 and 5 respectively. Societe Generale plans to improve the overall quality of its calculations in the future as client data becomes available or by using physical activity-based emissions factors (PCAF Score 3).

## SCOPE 3 FINANCED EMISSIONS ASSOCIATED WITH THE VALUE CHAIN (MtCO<sub>2</sub>e, Q4 2023)



<sup>(1)</sup> Societe Generale is currently finalising the calculation of absolute emissions for the residential real estate sector based on the surface of the residential assets. <sup>(2)</sup> The 74% figure is based on the exact boundary of each sector's target (i.e., only the value chain segments and emissions sources covered by the target are taken into account). If one considers that each sector's target allows to align the full sector's value chain, the share of financed Scope 1&2 emissions covered by NZBA targets reaches 82% of total scope 1&2 corporate financed emissions



# FINANCED EMISSIONS AND TARGETS BY SECTOR

## DATA ON SECTOR-SPECIFIC ALIGNMENT AND TRANSITION TARGETS<sup>(1)</sup>

FINANCED EMISSIONS associated with the value chain										DECARBONIZATION TARGETS					
Sector		Scope 1&2 (mtCO <sub>2</sub> e, Q4-2023) <sup>(2)</sup>	PCAF Score <sup>(3)</sup>	Scope 3 (mtCO <sub>2</sub> e, Q4-2023) <sup>(2)</sup>	PCAF Score <sup>(3)</sup>	Sector boundary	Metric	Scenario	Emissions scope	Baseline	Target	Reduction target	Progress	Progress in%	New target date
ENERGY	Oil and gas	16,8	3,8	26,1	3,9	Exploration, development and production (upstream)	Gross commitments (€m, index 100)	IEA NZE 2050	N/A (financing target)	100 (2019)	50 (2025) 20 (2030)	-50% (2025) -80% (2030)	52 (2023)	-48% (2023)	2023
						Upstream, midstream, downstream	Absolute GHG emissions (in MtCO <sub>2</sub> eq.)	IEA NZE 2050	Scopes 1 & 2 + Scope 3.11 (end-use) of the upstream part of the value chain	29.6 (2019) PCAF Score 4.7	8.9 (2030)	-70%	13.7 (2023) PCAF Score 4.9	-54% (2023)	2023
	Power	27,9	4,3	4,0	4,4	Power generation	GHG emissions intensity (gCO <sub>2</sub> eq./kWh)	IEA NZE 2050	Scopes 1 & 2	221 (2019)	125 (2030)	-43%	132 (2023)	-41% (2023)	2022
						Thermal coal value chain	Gross commitments (€m, index 100)	IEA NZE 2050	N/A (financing target)	100 (2019)	0 by 2030 for OECD countries; 0 by 2040 elsewhere <sup>(4)</sup>	-100%	53 (2023)	-47% (2023)	2019
HEAVY INDUSTRIES	Cement	2,7	3,1	1,8	3,1	Cement producers	GHG emissions intensity (kgCO <sub>2</sub> eq./t cement)	IEA NZE 2050	Scopes 1 & 2, calculated on a gross basis	671 (2022)	535 (2030)	-20%	678 (2023)	+1% (2023)	2023
	Steel	0,7	3,5	2,8	3,6	Crude steel producers	SSP alignment score of GHG emission intensity <sup>(5)</sup>	IEA NZE 2050 MPP TM	Scopes 1 & 2 <sup>(5)</sup>	0.55 (2022)	0 (2030)	N/A	0.04 (2023)	N/A	2023
	Aluminium	0,1	4,4	0,1	4,4	Aluminium producers	GHG emissions intensity (tCO <sub>2</sub> eq./t aluminium)	IAI/MPP STS	Scopes 1 & 2 + Scope 3 upstream	8.0 (2022)	6.0 (2030)	-25%	7.7 (2023)	-4% (2023)	2023
TRANSPORT	Automotive	0,7	3,7	5,5	3,7	Car manufacturers	GHG emissions intensity (gCO <sub>2</sub> eq./v-km)	IEA NZE 2050	Scope 3.11 (end use)	184 (2021)	90 (2030)	-51%	159(2023)	-14% (2023)	2023
	Shipping	3,8	3,9	2,4	4,0	Ships from ship owners & operators	Poseidon Principles alignment score of AER <sup>(6)</sup>	IMO Striving For <sup>(7)</sup>	Scope 1 and Scope 3.3 <sup>(8)</sup>	+24.2% (2022)	+15% (2030)	-43% <sup>(6)</sup>	+24.2% (2022)	N/A	2023
	Aviation	2,1	3,8	3,5	3,9	Aircrafts owned or operated by airlines & lessors	GHG emissions intensity (gCO <sub>2</sub> eq./RTK)	MPP PRU	Scope 1 and Scope 3.3 <sup>(8)</sup>	950 (2019)	775 (2030)	-18%	886 (2022)	-7% (2022)	2024
REAL ESTATE	Commercial real estate	0,8	4,6	2,1	4,6	Real estate professional investors & assets	GHG emissions intensity (kgCO <sub>2</sub> eq./m2/y)	CRREM V2.02	Scopes 1 & 2, from a real estate asset's perspective	49 (2022)	18 (2030)	-63%	49 (2022)	N/A	2023
	Residential real estate <sup>(9)</sup>	N/A	N/A	N/A	N/A										
	Agriculture	2,0	4,0	8,0	4,0										

**(1)** The reduction targets are supported by origination guidelines to keep the Group on track. Applicable at either client or transaction level, separate guidelines exist for each sector, to take into account specific constraints. **(2)** While our targets focus on the sector boundaries disclosed in this table, known to be the most material parts of their respective value chains, the calculation of Financed Emissions cover the sector's full value chain. It consists in aggregating the financed emissions of all companies classified within activity sectors from the NACE classification identified by Societe Generale as being part of the same comprehensive value chain. Financed Emissions are then calculated according to the PCAF methodology whereby we account for a portion of the annual emissions of our clients by determining the ratio between the outstanding debt and the total equity and debt of the client. **(3)** The PCAF Score measures the data quality used to calculate Financed Emissions. When available, we have used data reported by clients and collected via Bloomberg or clients' annual reports (PCAF Score of 1 for verified data or 2 for unverified data). Otherwise, we have used revenue-based or asset-based emissions factors to estimate clients' emissions, with PCAF Scores of 4 and 5 respectively. **(4)** Target applying to both thermal coal power and thermal coal mining. **(5)** This target is an alignment score. A positive alignment score means that the steel portfolio is not aligned with the IEA NZE 2050 scenario. Conversely, a negative or zero alignment score means that the steel portfolio is aligned with the IEA NZE 2050 scenario. For the scope of emissions, a fixed-boundary system as per the SSP is used covering Scopes 1, 2 and a portion (depending on the level of vertical integration) of Scope 3 emissions (specifically category 1 and 10). **(6)** This target is an alignment score. A positive alignment score means that the shipping portfolio is not aligned (i.e. that it exceeds the decarbonisation trajectory). Conversely, a negative or zero alignment score means that the shipping portfolio is aligned. The -43% reduction target applies to the intensity metric (AER). **(7)** Excluding cruise ships, until such time as the IMO's carbon intensity indicator can be adapted to take into account the specificities involved. **(8)** Or "Well-to-Wake" emissions corresponding to (i) operational activities (i.e., Scope 1, or tank-to-wake emissions for shipowners/airlines) from fuel combustion on board of a vessel/aircraft and (ii) upstream activities (i.e., Scope 3 category 3, or well-to-tank emissions for shipowners/airlines) including extraction, cultivation, production, processing, storage, transport and bunkering of fuels. **(9)** Societe Generale is currently finalising the calculation of absolute emissions for the residential real estate sector based on the surface of the residential assets.



# ALIGNMENT METHODOLOGY

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<b>THERMAL COAL</b>	<b>26</b>	<b>AUTOMOTIVE</b>	<b>47</b>
1. Sector Dynamics	26	1. Sector Dynamics	47-48
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3. Decreasing exposure on upstream Oil & Gas	31	3. Taking Action to Shift	53
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<b>POWER</b>	<b>33</b>	<b>AVIATION</b>	<b>54</b>
1. Sector Dynamics	33-34	1. Sector Dynamics	54
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1. Sector Dynamics	38	1. Sector Dynamics	57-58
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# 1. SECTOR DYNAMICS

Coal is the largest emitter of energy-related CO<sub>2</sub>e<sup>(1)</sup>, accounting for 42% of emissions in 2022<sup>(1)</sup>, and the largest source of electricity generation worldwide, accounting for 36% of global generation in 2022<sup>(2)</sup>. Reaching IEA’s NZE Scenario implies a drastic reduction in coal consumption by 2050.

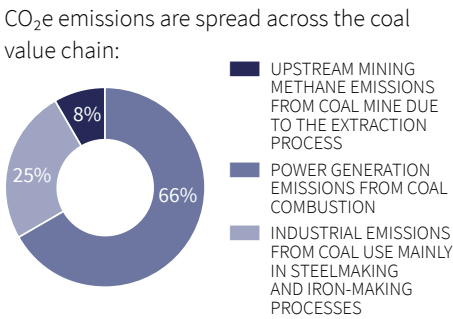
## Sector overview

Coal supplied 36% of global electricity generation in 2022 (thermal coal) and plays a crucial role in iron and steel production industries (metallurgical coal).

The IEA NZE Scenario forecasts a sharp decrease in coal use, with a 44% reduction between 2022 and 2030 driven by the transition of power generation systems (increasing renewable power outputs) and an additional 85% reduction between 2030 and 2050 driven by low-carbon technology deployment in the industry and faster coal-to-power displacement<sup>(3)(4)</sup>.

However, coal consumption increased in 2021 and 2022<sup>(5)</sup>, due to strong demand for power generation in developing economies and the switch from gas to coal in the context of the global energy crisis.

## Emission sources<sup>(5)(6)</sup>

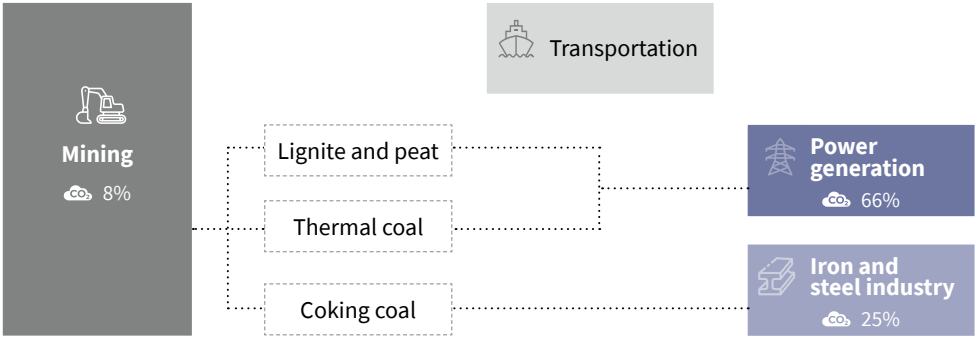


## Decarbonisation levers<sup>(7)</sup>

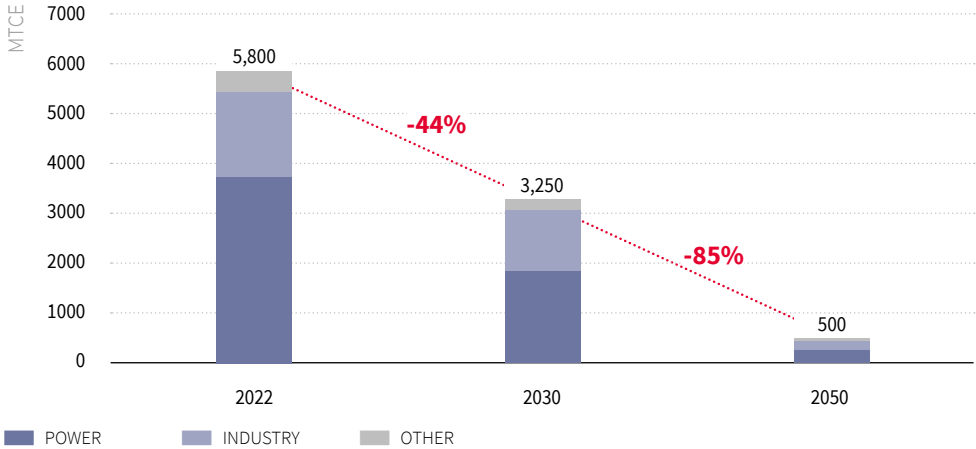
**Closure and exit:** power generation emissions can be reduced by using mature low-carbon alternatives<sup>(\*)</sup>, and by gradually displacing baseload coal-fired power plants. According to the IEA NZE Scenario, coal demand for power generation could be reduced by 92% between 2022 and 2050. However, this incurs multiple socio-economic challenges for coal-dependent economies. As there are limited alternatives to coal in iron and steel processes for the moment, coal demand from the industry is forecast to fall from 2030 onwards, when less mature technologies are scaled in the industrial processes of the steel and iron industries. Thermal coal demand will thus decrease by 50% by 2030 while metallurgical coal demand will decrease by 30% in IEA’s NZE Scenario.

**CCUS:** the IEA estimates that half of coal mine methane emissions could be abated with existing technologies. On-site capture and use of methane via degasification or ventilation systems could additionally increase energy recovery for heat production or small-scale power generation. Residual emissions in the steel & iron industry can be addressed with CCUS technologies. However, the installation of CCUS units on coal-fired power plants can be challenged by comparison with low-carbon solutions in the power sector.

## GLOBAL COAL EMISSIONS ALONG THE VALUE CHAIN (% OF TOTAL COAL EMISSIONS, 2021)<sup>(5)(6)</sup>



## THERMAL AND METALLURGICAL COAL DEMAND BY SECTOR IN IEA'S NZE SCENARIO<sup>(5)</sup>



(1) IEA, CO<sub>2</sub> emissions in 2022. (2) IEA, Coal. (3) IEA, Net Zero by 2050. (4) IEA, Net Zero Roadmap: A global Pathway to Keep the 1.5°C Goal in Reach. (5) IEA, Coal in Net Zero Transitions. (6) IEA, World Energy Outlook 2022. (7) IEA, Strategies to reduce emissions from coal supply. (\*) Energy-related emissions refer to emissions from energy combustion and industrial processes. (\*\*) E.g. solar, wind, hydro.



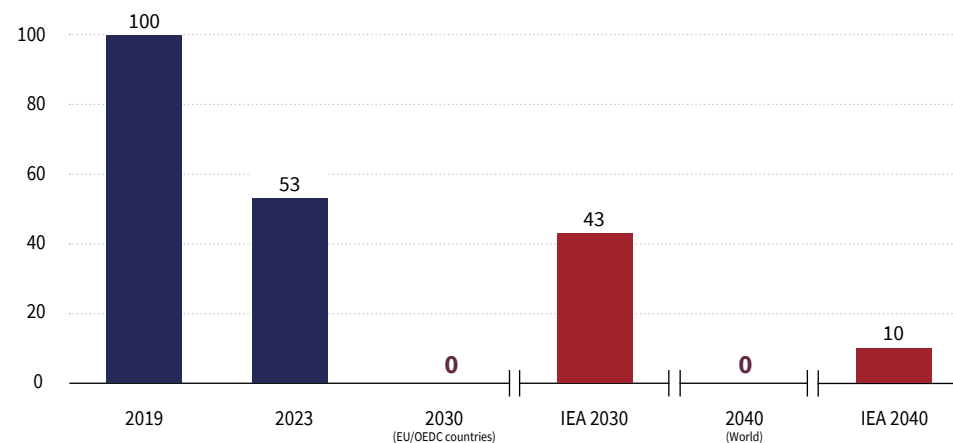


## 2. TAKING ACTION TO PHASE OUT THERMAL COAL

### Thermal coal policy

- Back in 2016, Societe Generale announced that it would not provide any new financing dedicated to coal mining or coal-fired power plant projects.
- In 2019, Societe Generale published a long-term objective to progressively reduce its exposure to thermal coal to zero by 2030 in the EU and OECD countries and by 2040 elsewhere.
- In 2020, the Group published an updated Thermal Coal Sector Policy<sup>(1)</sup>, detailing concrete actions taken in support of its long-term objective:
  - First, the Group began by disengaging from the most exposed companies (i.e. for which thermal coal accounts for more than 25% of revenue), which have not made commitments to exit the thermal coal sector. The Group has also strengthened the criteria for all other clients and prospects;
  - Secondly, starting from the end of 2021, Societe Generale decided to stop providing new financial products and services to any company with mining or power thermal coal assets which is a thermal coal developing company or has not communicated a transition plan aligned with the 2030/2040 thermal coal phase out objectives of Societe Generale.
- The Group has been engaging with clients that have a transition plan and are still active in the sector to ensure their exit from thermal coal is ongoing. The Group wants to accompany those clients who are diversifying into renewable energies (power companies) or minerals critical to the energy transition (mining companies).

**FINANCING TO THERMAL COAL  
(INDEX BASE 100)**



<sup>(1)</sup> Societe Generale, Thermal Coal sector policy.



# 1. SECTOR DYNAMICS

DECARBONISATION  
LEVERS (see page 15)



The Oil & Gas (O&G) sector accounts for more than 50% of energy-related GHG emissions<sup>(1)(2)</sup>. 75% of these emissions are indirect emissions from the end use of O&G products; thus, O&G companies should review their entire business strategy.

## Sector overview<sup>(3)(4)(5)(6)</sup>

The Oil & Gas (O&G) sector faces a strategic challenge as energy transition and economic development create a simultaneous need to supply both low-carbon and affordable energy. The IEA forecasts two phases in O&G production evolution:

- Before 2030: consumption increases, supported by the strong energy demand of emerging economies and increasing use for non-energy purposes (e.g. in the petrochemical industry)<sup>(7)</sup>;
- After 2030: oil and gas consumption decreases as energy generation processes switch to renewable sources and low carbon mobility solutions continue to ramp-up.

O&G companies face increasing transition risks: more competitive alternative low-carbon technologies, clients' preference and greater willingness to pay for low-carbon energies, growing political and regulatory pressure, and stricter climate-related expectations from investors and lenders. In the mid- to long-term, some O&G assets could become stranded. Anticipating the sector's transition is necessary for O&G companies and investors to reduce their risks and ensure a fair transition for the workers and communities relying on these activities.

Facing those risks, O&G companies can leverage their know-how to seize energy

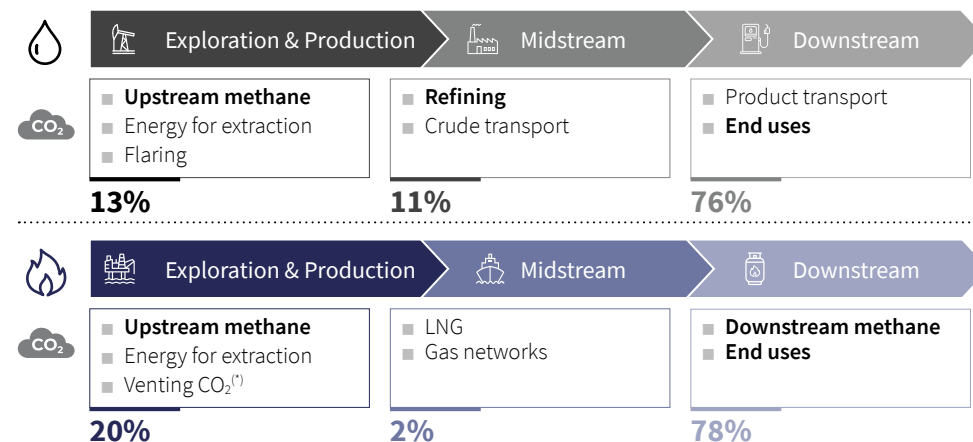
transition opportunities in other sectors (e.g. power, transportation), and direct their fossil fuel production towards non-energy uses (e.g. petrochemical industry). In 2018, around 14% of oil production and 8% of gas production was used as petrochemical feedstock<sup>(8)</sup>. With economic development, demand for petrochemical products increases, creating a shift in refinery outputs from energy products such as gasoline and diesel towards petrochemical feedstock such as naphtha or ethane. The IEA NZE Scenario forecasts an increase in petrochemical feedstock production share in refineries from 20% in 2020 to almost 60% in 2050<sup>(9)</sup>.

## Emissions sources<sup>(2)(8)(10)</sup>

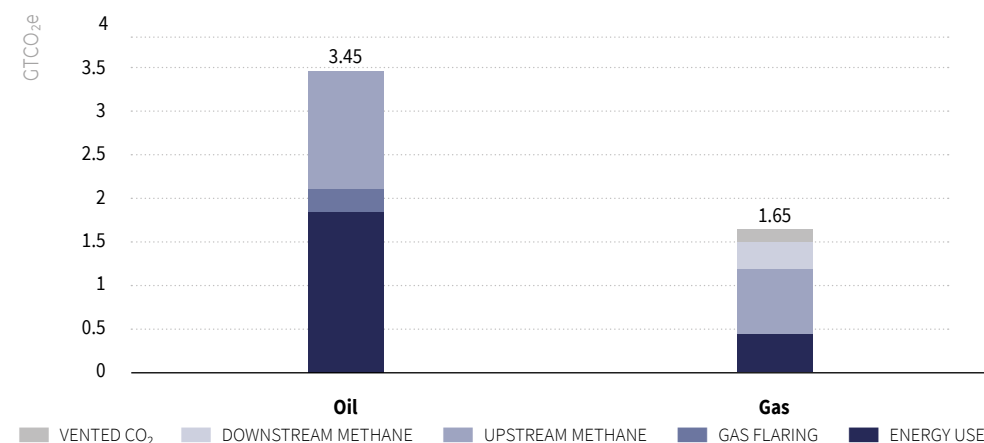
Around 75% of the O&G industry emissions come from end uses downstream of the value chain such as passenger cars, aviation and industry (scope 3 emissions).

The remaining 25% come from upstream exploration and production activities, industrial processes and logistics (scope 1 & 2 emissions). They are linked to methane emissions from production and transportation<sup>(10)</sup>, flaring, operation of upstream facilities, and CO<sub>2</sub> emissions from gas liquefaction. Methane emissions from oil and gas operation accounted for 47% of total oil and gas operations' emissions in 2022<sup>(6)</sup>.

## DISTRIBUTION OF GHG EMISSIONS ALONG THE OIL & GAS VALUE CHAINS<sup>(6)</sup>



## SPECTRUM OF GLOBAL SCOPE 1 AND 2 EMISSIONS FROM OIL & GAS OPERATIONS (2022)<sup>(9)</sup>



(1) IEA, Oil Report, 2023. (2) IEA, CO<sub>2</sub> emissions in 2022. (3) IEA, Net Zero by 2050 report. (4) IEA, World Energy Outlook, 2022. (5) UNEP, Sectoral risks for the Oil and Gas sector, 2023. (6) IEA, The Oil and Gas Industry in Energy Transitions, 2020. (7) S&P, Petrochemical Feedstocks, 2022. (8) IEA, World Energy Outlook, 2018. (9) IEA, Emissions from oil and gas operations in Net Zero Transitions, 2023. (10) IPCC guidelines for GHG inventories, 2019. (\*) Venting CO<sub>2</sub>: CO<sub>2</sub> removed from gas to avoid its solidification during gas liquefaction.



# 1. SECTOR DYNAMICS

DECARBONISATION  
LEVERS (see page 15)



The transition of Oil & Gas (O&G) companies will mostly be related to their capacity to progressively switch from O&G to low-carbon energy-based business activities. Many of them can leverage potential synergies to diversify their activities.

## Decarbonisation levers<sup>(1)(2)(3)</sup>

O&G companies can act on different levers:

**Energy efficiency:** direct GHG emissions (scope 1 & 2) can be reduced through specific actions:

- Tackling methane emissions and stopping routine gas flaring;
- Implementing energy efficiency measures for O&G extraction, refining and logistics.

**Diversification:** the reduction of a company's scope 3 emissions (larger scope) will necessitate the development of low-carbon energy/power products and solutions for their final clients:

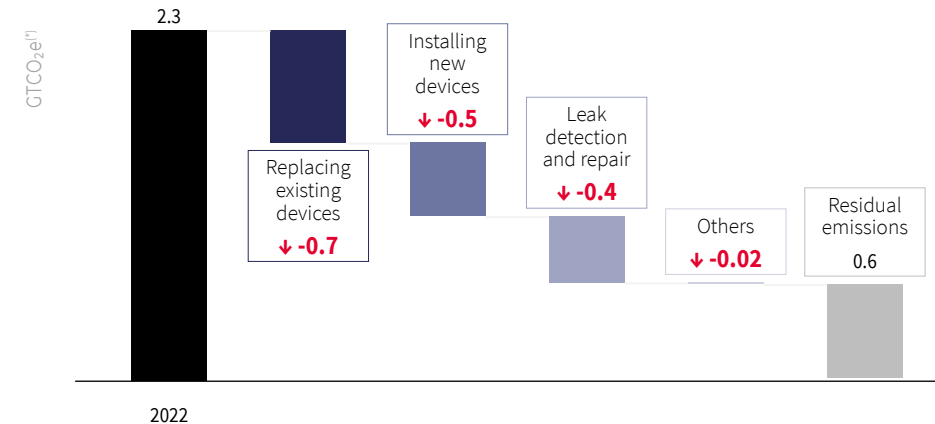
- Renewable fuels like biofuels, biogas and low-carbon hydrogen to address the low-carbon energy needs of their clients;
- Diversification across the power value chain to seize the electrification megatrend. This involves the development of both large-scale power assets (on/offshore wind, solar) and distributed power generation;
- Some companies have started to work on carbon capture technologies, leveraging their industrial know-how and financial capabilities.

O&G companies can participate in the energy transition by leveraging their energy market expertise, existing client portfolios and financial capacity to develop low-carbon energies and carbon/energy service offers for their end clients<sup>(4)</sup>.

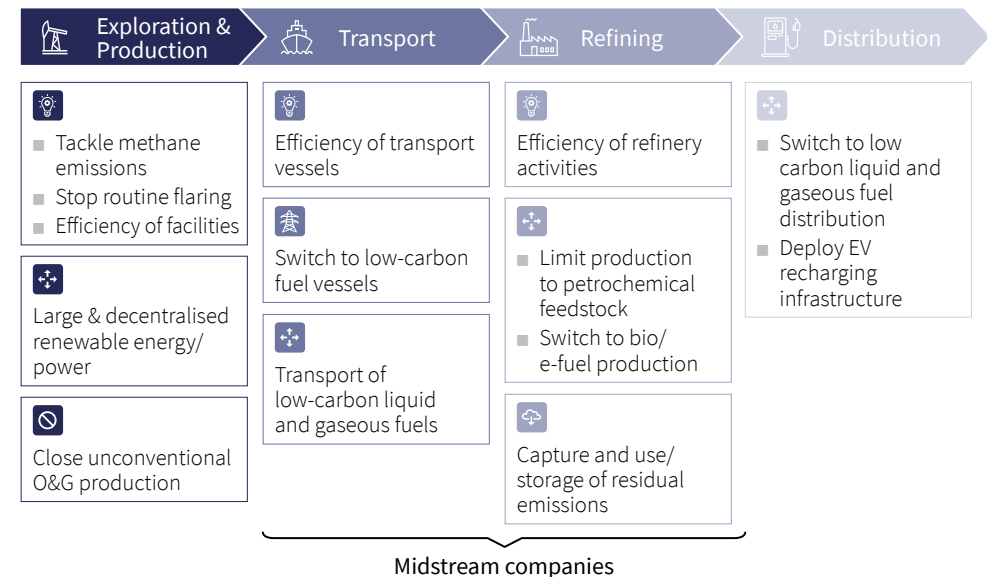
Along the O&G value chain, companies have specific decarbonisation levers and synergies they can employ to reduce their scope 3 emissions:

- Upstream exploration and production companies possess infrastructure and engineering capabilities to develop offshore wind power generation capacity;
- Midstream and distribution companies can leverage their transport infrastructure to distribute low-carbon liquid and gaseous fuels such as biomethane and hydrogen;
- Refining companies can use biofeedstock and waste to produce biofuels and petrochemical products. They can also use energy efficiency measures and low carbon hydrogen to reduce their operational emissions and potentially integrate CCUS capacities to tackle residual emissions.

## GLOBAL METHANE EMISSIONS AND POTENTIAL SAVINGS BY OPERATIONS<sup>(5)(6)(7)</sup>



## DECARBONISATION LEVERS FOR OIL & GAS COMPANIES ALONG THE VALUE CHAIN<sup>(8)</sup>



(1) IEA, Net Zero by 2050 report. (2) IEA, World Energy Outlook, 2022. (3) IEA, World Energy Outlook, 2018.  
 (4) IEA, The Oil and Gas Industry in Energy Transitions, 2020. (5) IPCC guidelines for GHG inventories, 2019.  
 (6) IEA, Marginal abatement cost curve for Oil and Gas-related methane emissions.  
 (7) IEA, Methane emissions from Oil & Gas operations. (8) Blunomy analysis. (\*) Global Warming potential (100-year horizon) = 29.8 taken from the IPCC Sixth Assessment Report.





Coal



Oil &amp; Gas



Power



Cement



Steel



Aluminium



Automotive



## 2. ALIGNING OIL & GAS ABSOLUTE EMISSIONS

O&G production is expected to decrease in an NZE economy; in this context, the use of an intensity metric to align our portfolio could be misleading as the intensity could improve whereas actual emissions have in fact risen due to O&G production increases. Using an absolute metric (scope 1, 2 and 3 end-use) on the other hand, corresponds to a clear ambition to reduce the total carbon output on the entire value chain.

### Scope

#### SECTOR BOUNDARY

##### Upstream, midstream and downstream O&G companies

Upstream refers to exploration, development and production.

Midstream activities relate to transport, storage, liquefaction and export terminals of oil, natural gas or LNG.

Downstream generally consists of refining and distribution activities.

#### EMISSIONS SCOPE

The indicator covers scopes 1, 2 & 3 end-use (category 11) for producing companies and scopes 1 & 2 emissions for midstream and downstream companies. Scope 3 end-use emissions are generated from the combustion of fossil fuels extracted by a producing company.

#### FINANCING ACTIVITIES

All loan-related products are included.

General purpose and dedicated loans are included.

### Methodology

#### CALCULATION METHODOLOGY

PCAF

#### SCENARIO

IEA Net Zero by 2050

#### METRICS

Absolute emission metric: tCO<sub>2</sub>e

##### Portfolio emissions (tCO<sub>2</sub>e)

$$\begin{aligned}
 &= \sum_{\text{Company}} \left( \text{Company scope 1 \& 2 emissions (tCO}_2\text{e)} \right) \\
 &\times \frac{\text{Bank financing (€)}}{\text{Company Equity \& Debt (€)}} \\
 &+ \sum_{\text{Upstream Company}} \left( \text{Company scope 3 emissions (tCO}_2\text{e)} \right) \\
 &\times \frac{\text{Bank financing (€)}}{\text{Company Equity \& Debt (€)}}
 \end{aligned}$$

#### KEY ASSUMPTIONS AND LIMITATIONS

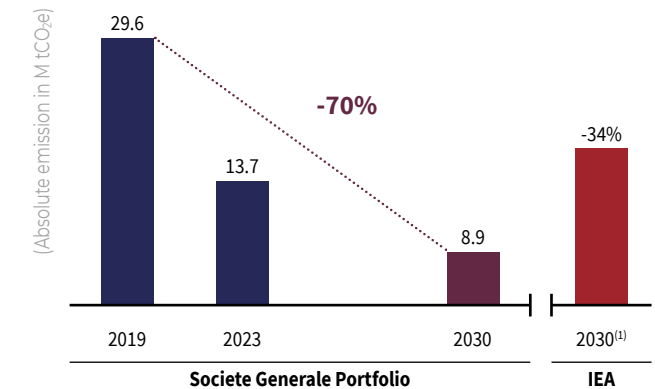
Inconsistency of data availability for Methane (CH<sub>4</sub>) emissions within operational scopes.

### Target & Progress

#### BASELINE & TARGET

Absolute Emissions M tCO <sub>2</sub> e	2019 Q4	2030	% reduction
Societe Generale Portfolio	29,6	8,9	70%

#### PROGRESS



#### DATA PROVIDERS

IEA World Energy Outlook, S&P IHS Markit

(1) In the IEA NZE Scenario, the absolute emissions fall by 34% between 2019 and 2030.



Coal



Oil &amp; Gas



Power



Cement



Steel



Aluminium



Automotive



### 3. DECREASING EXPOSURE ON UPSTREAM OIL & GAS

The amount of financing granted to a sector is the easiest metric to understand. To tackle the O&G sector quickly and effectively, we decided to gradually reduce our exposure to the sector, setting an intermediary milestone for 2025, to demonstrate we are acting now, irrespective of the energy source (oil or gas).

#### Scope

##### SECTOR BOUNDARY

Oil & Gas Producers (Upstream)

##### FINANCING ACTIVITIES

All loan-related products are included.

General purpose and dedicated loans are included.

#### Methodology

##### CALCULATION METHODOLOGY

PACTA methodology for Banks

##### SCENARIO

IEA Net Zero by 2050

##### METRICS

Exposure

##### KEY ASSUMPTIONS AND LIMITATIONS

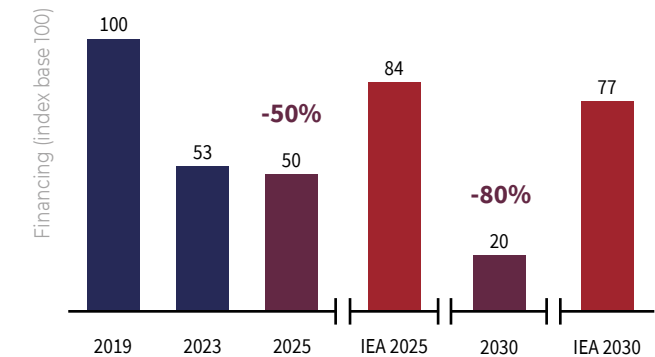
Floating Production Storage and Offloading (FPSOs) are out of scope since they have marginal influence over investment decisions to exploit new resources or pursue new strategic options.

#### Target & Progress

##### BASELINE & TARGET

Financing (Index base 100)	2019	2025	2030
Societe Generale Portfolio	100	50	20

##### PROGRESS



##### DATA PROVIDERS

Company reports



Coal



Oil &amp; Gas



Power



Cement



Steel



Aluminum



Automotive



## 4. TAKING ACTION TO SHIFT

### Clients and assets

- Since 2018, Societe Generale no longer finances the production of oil from oil sands or any type of oil production in the Arctic.
- In 2020, Societe Generale was one of the first global banks to commit to a short-term objective of reducing its exposure to upstream oil & gas by 20% by 2025, which it achieved ahead of target.
- In 2023, the Group reinforced its ambition by announcing a new objective **to reduce its upstream Oil & Gas (O&G) exposure by 80% by 2030 in addition to concrete and immediate actions:**
  - Stop providing financial products and services dedicated to upstream (O&G) greenfield projects;
  - Phase-out its exposure on upstream (O&G) private pure players;
  - Reinforce climate strategy assessment and engagement with clients with upstream activities;
- Pay systematic attention to the methane emissions reduction target and ensure elimination of routine flaring for companies active in upstream.
- **The Group developed a corporate transition assessment tool for the oil & gas sector.** This assessment takes into account a client's carbon footprint, climate commitments, diversification of activities, the level of investments devoted to activities in support of the energy transition and the governance put in place to implement climate ambition. The tool helps bankers to have a **constructive dialogue with (O&G) clients around their decarbonisation and diversification plans.** The Group wants to accompany the most advanced players in the sector who will be key players in new energy sources, such as hydrogen and renewable energies, low carbon mobility, and CCUS.

### Flagship deals

Societe Generale supports the decarbonisation and diversification of its clients in advanced economies and emerging countries through advisory and financing solutions.

Societe Generale is acting as exclusive financial advisor to the **Northern Endurance Partnership** which will use innovative carbon capture

technology and subsea CO<sub>2</sub> storage to power the UK's first zero-carbon industrial cluster. The Northern Endurance Partnership is a collaboration amongst three international energy companies – **BP, Equinor and Total Energies.**



### Industry and peers

- Societe Generale joined the Hydrogen Council, which brings together more than 120 member companies from across the various industrial and energy sectors involved in the hydrogen value chain: energy, oil and gas, chemicals, commodities, metals and mining, equipment manufacturers, cars and trucks, and other forms of transport (air, rail, shipping). Societe Generale intends to play an active role in supporting its clients through advisory and financing to develop the low carbon hydrogen economy.
- Societe Generale is part of the NZBA Oil & Gas working group.



**OLIVIER MUSSET**  
GLOBAL HEAD OF  
ENERGY PLUS GROUP

*“The Energy Group at Societe Generale is strongly committed*

*to fully contributing to the indirect emissions reduction targets of our Oil & Gas portfolio.*

*We are well on track to meet our ambitious interim targets that we have put in place to reduce our indirect carbon footprint and will continue to support our oil and gas customers in their transition to a low-carbon economy”*

Societe Generale advised and arranged financing for the development of the Rangebank Battery Energy Storage System project. This 200 MW/400 MWh

battery energy storage system will be built by **Shell Energy Australia** and **Eku Energy** to provide enough storage capacity to power 80,000 homes for an hour during peak periods.



Societe Generale also supports emerging leaders in developing alternative solutions to fossil fuels.



Societe Generale was mandated to provide advisory services for the development and financing of pioneering e-fuels installations for **HIF Global** in Chile, Uruguay and the United States.

# 1. SECTOR DYNAMICS

**DECARBONISATION LEVERS** (see page 15)

Power generation accounts for 42% of energy-related global CO<sub>2</sub> emissions. Electrification being a major decarbonisation lever for many energy-intensive sectors, the decarbonisation of power generation and the transformation of power systems are crucial to meet net-zero objectives.

## Sector overview

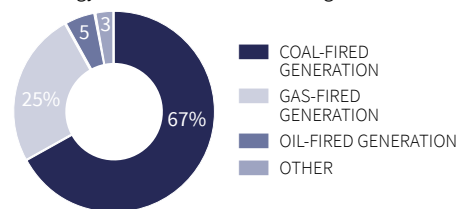
Electrification is undoubtedly a major trend in the energy transition. It will gradually become the backbone of our energy systems, as it is a powerful lever for decarbonisation in all sectors (transport, building and industry). The IEA NZE Scenario forecasts global electricity generation to increase by two-and-a-half-times from 2022 to 2050<sup>(1)</sup>, driven by several factors:

- Population and economic growth;
- Electrification of end uses especially in industry (e.g. use of electric arc furnaces for steel manufacturing), and transport (EVs);
- Expansion of hydrogen production via electrolysis (renewable power + water).

This projected increase in power consumption takes into account energy efficiency improvements, thus limiting final energy consumption to 53% of what it would have been in 2050 without energy efficiency measures<sup>(2)</sup>.

## Emissions sources<sup>(3)(4)(5)</sup>

In 2022, electricity generation accounted for 42% of energy-related emissions, among which:



Emissions from the power sector have increased between 2020 and 2022 due to a rise in power

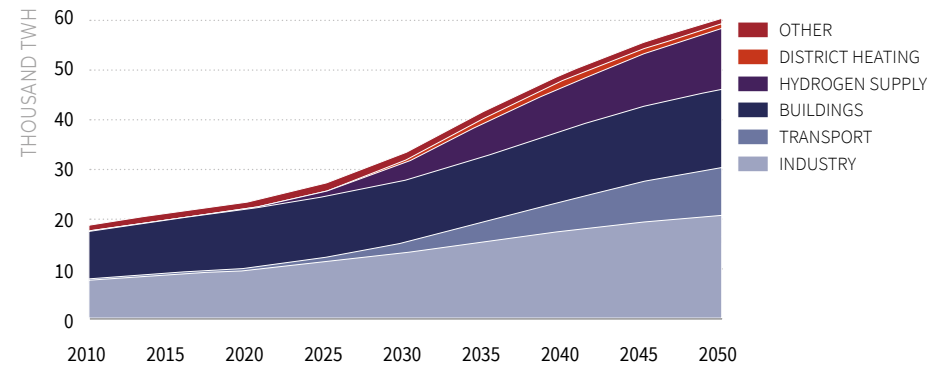
demand in developing countries and the switching from gas-to-coal. However, the emission intensity of electricity decreased by 6% between 2000 and 2022. Also, wind and solar generation growth met 80% of the increase in global electricity demand in 2022. EMBER, an energy think tank, projected clean power generation growth was due to exceed demand growth in 2023 (with new production capacity being used for peak production) resulting in a fall in fossil generation and a decrease in global power generation emissions<sup>(6)</sup>.

## Decarbonisation levers

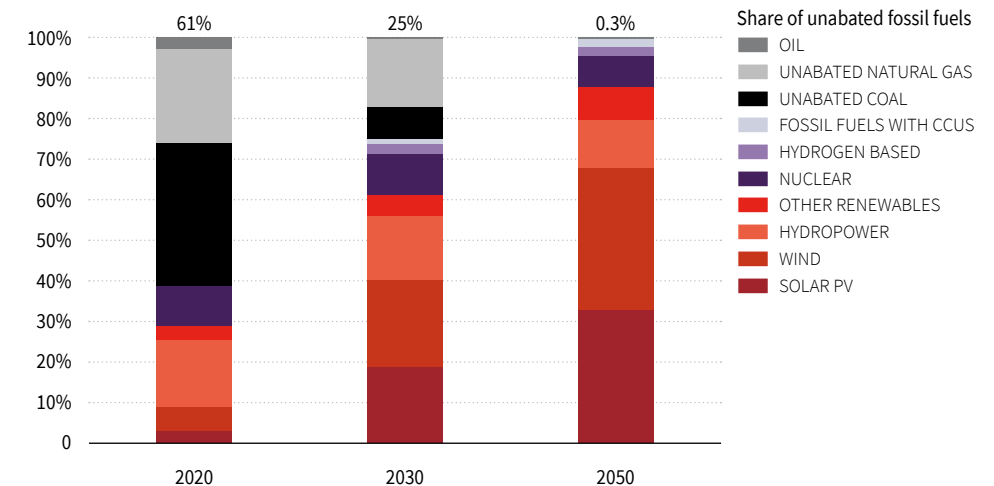
**Wind and Solar generation:** wind and solar share in global electricity production increased by 2 percentage points in 2022, reaching 12% of global production<sup>(7)</sup>. IEA's NZE Scenario forecasts electricity production from wind and solar technologies at around 70% of global production in 2050<sup>(2)</sup>. These renewables offer low-cost electricity production alternatives. Therefore, they benefit from broad political support and strong momentum in the installation of renewable capacity (+9% per year between 2015 and 2022<sup>(8)(9)</sup>).

**Low carbon generation and infrastructure development:** IEA's NZE Scenario relies on additional production capacities from nuclear and hydropower, as well as storage capacity development and infrastructure modernisation to support the electrification of end uses and related electricity demand growth while ensuring grid stability and flexibility<sup>(9)</sup>.

## ELECTRICITY DEMAND BY SECTOR IN IEA'S NZE SCENARIO<sup>(3)</sup>



## DISTRIBUTION OF POWER GENERATION TECHNOLOGIES IN GLOBAL PRODUCTION IN IEA'S NZE SCENARIO<sup>(3)</sup>



**(1)** IEA, CO<sub>2</sub> emissions in 2022. **(2)** IEA, Net Zero by 2050. **(3)** EMBER, Electricity Data Explorer. **(4)** Our World in Data, Global CO<sub>2</sub> emissions. **(5)** IEA, World Energy Outlook, 2022. **(6)** EMBER, Global Electricity Review, 2023. **(7)** IEA, Net Zero Roadmap: A global Pathway to Keep the 1.5°C Goal in Reach. **(8)** IRENA, Renewable Energy Capacity Statistics, 2023. **(9)** IEA, Tracking clean energy progress, 2023





Coal



Oil &amp; Gas



Power



Cement



Steel



Aluminium



Automotive



# 1. SECTOR DYNAMICS

DECARBONISATION  
LEVERS (see page 15)



The decarbonisation of the power generation mix poses multiple challenges, including the intermittency of renewable power generation and the availability of critical minerals necessary for scaling up low-carbon technologies.

## Challenges

Electricity is a major pillar in the IEA NZE Scenario. The decarbonisation of the power sector will be necessary for achieving significant emissions reductions. This will be principally achieved through the displacement of fossil fuel power generation by low-carbon power generation, mostly renewables, complemented by actions addressing the strong growth in demand for electricity<sup>(1)</sup>.

However, the deployment of low-carbon power generation capacities comes with challenges:

- The intermittency of renewables, impacting energy security and power grid balance;
- The need to develop supply chains for renewable power generation technologies.

This increase in power consumption includes energy efficiency improvements, limiting the final energy consumption to 53% of what it would be without energy efficiency measures in 2050<sup>(3)</sup>.

**Renewable intermittency:** overcoming this challenge requires a diversification of the power mix with network and interconnection development ensuring electricity security and grid stability in a fast-growing renewable electricity mix. To address electricity demand growth and align with the IEA NZE Scenario, annual investment in power grids must double by 2030 to reach over USD 700 bn<sup>(2)</sup>.

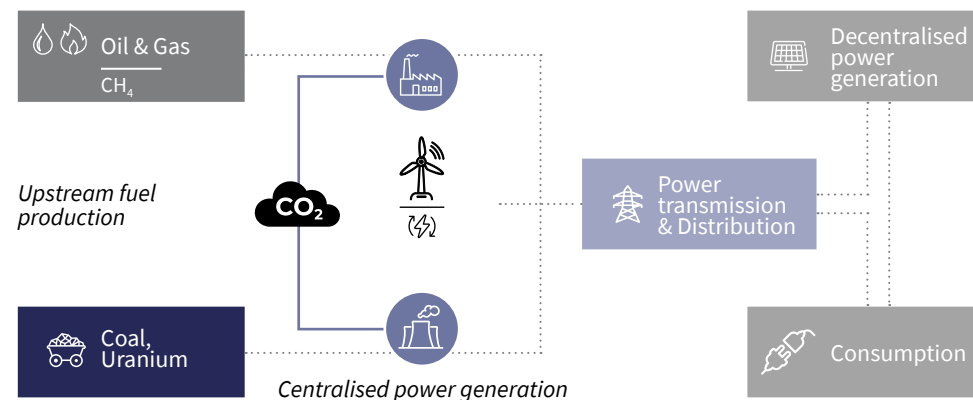
The IEA NZE Scenario identifies two additional levers to reduce disruption risks to the power system and grid unbalance:

- Pairing renewable power generation assets with short – and long-term stationary storage systems (battery, hydropower/ hydrogen). Battery systems must be scaled up to align with the massive deployment of renewables and electrification in the NZE Scenario;
- Supporting behavioural change and demand side response to smooth peaks in electricity demand. Public policies must be adapted to enable the introduction of such measures.

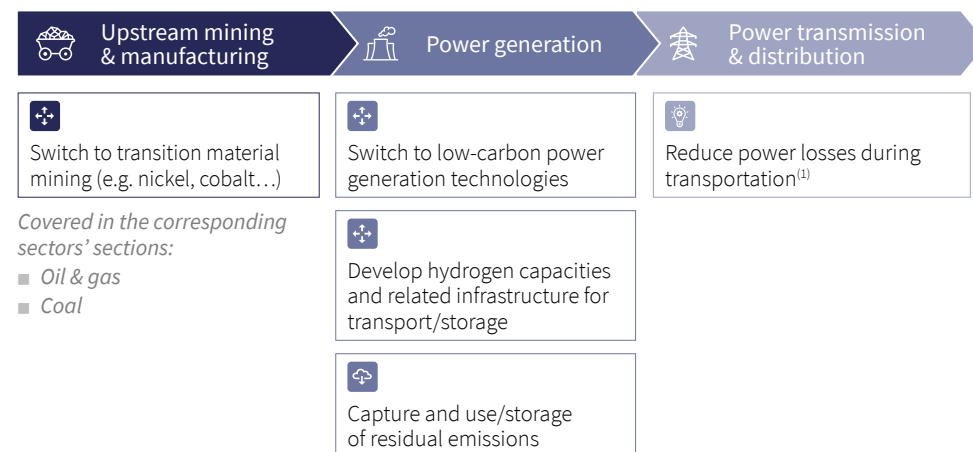
**Supply chain development:** the growth of low-carbon power generation technologies will put a strain on the entire supply chain with knock-on effects up to the extraction of raw materials (e.g. copper), limited access to reserves and competition among end uses (e.g. electric mobility). This will create challenges for the energy transition<sup>(3)</sup>.

The concentration of equipment manufacturing (e.g. solar modules) amid growing geopolitical tensions increases the risk of supply chain disruption. Upstream suppliers and power generation companies are expected to support the development of sustainable and reliable supply chains for low-carbon generation equipment to ensure continuous growth in line with IEA's NZE Scenario<sup>(4)</sup>.

## POWER SECTOR VALUE CHAIN AND EMISSIONS MATERIALITY<sup>(5)</sup>



## DECARBONISATION LEVERS FOR POWER COMPANIES ALONG THE VALUE CHAIN<sup>(5)</sup>



(1) IEA, Net Zero by 2050. (2) IEA, Tracking clean energy progress, 2023. (3) IEA, Mineral requirements for clean energy transition, 2021. (4) IEA, Special report on Solar PV global supply chain, 2022. (5) Blunomy analysis.



Coal



Oil &amp; Gas



Power



Cement



Steel



Aluminium



Automotive



## 2. ALIGNING POWER

As power generation is expected to grow due to increasing demands for electricity and transitioning away from fossil fuel generation to low-carbon sources, a target in intensity has been set to support the decarbonisation of this sector.

### Scope

#### SECTOR BOUNDARY

The scope of this portfolio focuses on counterparties active in the power generation segment as they represent most emissions within the power sector. Clients producing electricity from waste treatment are also included. The list is based on sectoral classification and internal knowledge.

#### EMISSIONS SCOPE

The indicator covers scopes 1 & 2 emissions for electricity producers. These are the emissions generated from the combustion of fossil fuels to generate electricity and the purchase of electricity, heating and cooling for the company's own needs. Scope 3 emissions are not covered as they are minimal in the overall power generation lifecycle.

#### FINANCING ACTIVITIES

All loan-related products are included.

General purpose and dedicated loans are included.

### Methodology

#### CALCULATION METHODOLOGY

PACTA methodology for Banks

#### SCENARIO

IEA Net Zero by 2050

#### METRICS

The indicator is based on an emissions intensity metric which allows for the monitoring of GHG emissions per unit of electricity generated expressed in gCO<sub>2</sub>e/kWh.

$$\frac{\text{Scope 1 \& Scope 2 emissions (gCO}_2\text{e)}}{\text{Power production (kWh)}}$$

#### KEY ASSUMPTIONS AND LIMITATIONS

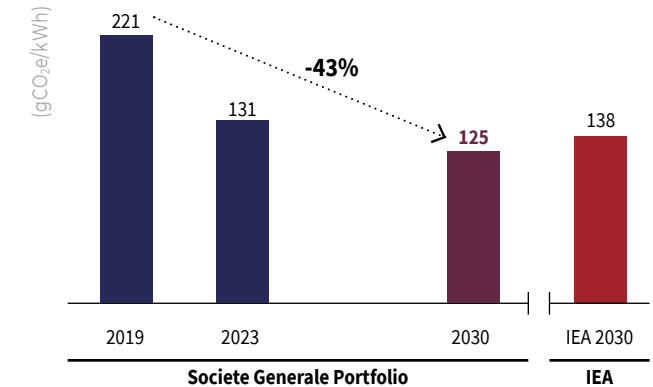
The model focused on the three most emissive CO<sub>2</sub> technologies: Coal, Oil and Gas. Renewable energies and nuclear are considered Zero-CO<sub>2</sub> emitters.

### Target & Progress

#### BASELINE & TARGET

gCO <sub>2</sub> e/kWh	2019	2030	% reduction
Societe Generale Portfolio	221	125	43%
IEA's NZE 2050	468	138	71%

#### PROGRESS



#### DATA PROVIDERS

IEA World Energy Outlook, S&P IHS Markit



### 3. TAKING ACTION TO SHIFT

#### Clients and assets

- Back in 2016, Societe Generale announced that it would not provide any new financing dedicated to coal-fired power plant projects.
- In 2019, Societe Generale published a long-term objective to progressively reduce its exposure to thermal coal power to zero by 2030 in the EU and OECD countries and by 2040 elsewhere.
- Under “**The Shift**” initiative, bankers from different business lines and geographies have been working together to:
  - Build further expertise on renewables (onshore, offshore, floating), hydrogen, storage, transmission and distribution networks, small scale power assets and decentralized energy;
  - Identify the **emerging leaders of tomorrow** that are developing new power technologies, biogas and biomethane, and are providing innovative products or services or developing clean energy project pipelines.
- To support all energy transition makers at their various development stages, **Societe Generale has decided to launch a two-fold EUR 1 billion transition investment initiative comprised of:**
  - EUR 0.3 billion debt;
  - EUR 0.7 billion equity component
 and for which the investment focus is on Energy Transition, nature-based solutions and impact driven investments.
- The Group is developing a corporate transition assessment tool (TOP) for the power sector to help bankers have constructive dialogues with clients around their decarbonisation and diversification plans.

#### Industry and peers

- Societe Generale is historically an **active member of the French Wind Association, the Syndicat des Energies Renouvelables and the Hydrogen Council.**



**JÉRÔME DEFLESSELLES**  
HEAD OF ENERGY  
BUSINESS INITIATIVES  
AMER-EMEA-APAC

*“As energy bankers, our objective at*

*Societe Generale is to support our clients as energy transition makers to help them grow and overcome their own challenges and found their transition projects both on equity and debt sides.*

*Societe Generale has supported the energy transition early on and is recognised for its expertise and its continuous support of the sector.*

*2024 is another year of innovation with many initiatives that represent a strong testimony of Societe Generale’s commitment to sustainable finance and the low carbon economy.”*



Coal



Oil &amp; Gas



Power



Cement



Steel



Aluminum



Automotive



### 3. TAKING ACTION TO SHIFT

#### Flagship deals

Societe Generale supports the transition of the power sector along the value chain:



In 2022, Societe Generale US acted as Joint Lead Arranger and Hedge Provider for the financing of a **335 MW residential solar portfolio for the solar and storage developer Sunrun** (USD 600 million).



In August 2022, Societe Generale was the Mandated Lead Arranger & Hedge Provider for the **Ishikari Offshore wind (112 MW) & battery storage (100 MW/180 MWhr)** project in Japan developed by Pattern and Green Power.



Societe Generale acted as sole Financial Advisor, MLA, Sole Hedge Execution Bank, Hedge Provider and Account Bank in the financing to support the construction of the **NeuConnect Interconnector** between Germany and the UK. The project



(EUR 2.8 billion investment) will have a triple impact supporting the energy transition, increasing competition among generators for the benefit of end consumers and strengthening security of supply across Germany and the UK.



Societe Generale acted as Green Loan Coordinator, Agent Mandated Lead Arranger and Lender for the EUR 133 million loan in coordination with **Senegal's Agence Nationale des Energies Renouvelables** for the installation of



**100,000 solar-powered streetlights across Senegal.** This transaction will foster renewable integration in Senegal's public services.

#### Societe Generale is making direct investments in funds supporting the energy and ecological transitions

- In 2023, participating in the last EUR 140 million private placement round, **Societe Generale became a strategic investor in EIT Inno Energy.** Through this strategic partnership, Societe Generale will support the development of InnoEnergy's current portfolio of 200 startups and support its strategic focus on large industrial actors by providing valuable access to its full range of financing and advisory services and to its own eco-system of clients and investors.
- In 2023, Societe Generale joined a consortium of multiple international investors such as the European Investment Bank and Proparco in the EUR 87.5 million closing of the **Afrigreen Debt Impact Fund.** Afrigreen will finance on-and off-grid solar power plants for small and medium-sized commercial and industrial consumers in Africa and will help bridge the funding gap through direct lending and asset-based debt facilities for regional and international developers.



#### Lumo embarked on an ambitious scale-up

- **Lumo, a fully-owned subsidiary,** is an online crowdfunding platform which **has supported more than 200 energy transition projects in France** since its creation. Its strategy was expanded in 2023 to **support other type of project having a Positive Impact.**
- Lumo contemplates the structuration of a **positive impact fund, structured by an Asset Manager,** that would be invested in Lumo's opportunities.
- In 2023, Lumo **obtained a European Agreement,** allowing the firm to operate on the European market and provide investors with an enhanced protection framework.

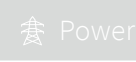


#### Pack Solaire, a solution to facilitate solar panel installation relying on an ecosystem of key partners

In 2023, the French retail network of Societe Generale launched the **'Pack Solaire'.** This solution targets corporates, associations and local authority clients to help them install solar panels. The bank has set up a diagnosis tool in partnership with NamR, a startup specialised in the analysis of building real estate data, and has developed a network of experts to perform detailed assessments of client needs. Societe Generale then helps facilitate the installation and operation of the solar panels by providing financing to the clients.







# 1. SECTOR DYNAMICS

DECARBONISATION  
LEVERS (see page 15)



The cement sector accounts for 7% of global anthropogenic CO<sub>2</sub> emissions, emission levels comparable to those of India<sup>(1)</sup>. The cement sector's carbon intensity should decrease from 0.58 tCO<sub>2</sub> per tonne in 2022 to 0.47 tCO<sub>2</sub> per tonne produced by 2030, in line with the IEA NZE Scenario<sup>(2)</sup>.

## Sector overview

Cement is one of the main constituents of concrete, with few substitutes. With demand driven by urbanisation and infrastructure development (mainly in developing countries), cement demand is set to increase by 45% by 2050<sup>(3)</sup>. This makes it all the more important to decarbonise its production.

## Emissions sources<sup>(3)</sup>

Cement is a hard-to-abate sector, with around 90% of the cement industry's emissions being direct, linked to the production of clinker.

- 50% – 60% of emissions are inextricably linked to cement manufacturing;
- The chemical reaction of limestone decomposition used to produce clinker, the main component of cement, results in the production of CO<sub>2</sub> during the process. These emissions are hard to abate as there is no viable alternative to the calcination of limestone for clinker production;
- 30% – 40% of emissions come from the combustion of fossil fuels to reach the temperature needed for this reaction to occur (> 1,400 °C);
- The remaining emissions come directly or indirectly from other activities including quarrying & transport, grinding & preparation of raw materials, cooling and mixing and construction.

## Decarbonisation levers<sup>(1)(2)(4)</sup>

The IEA NZE Scenario identified several decarbonisation levers for the cement sector:

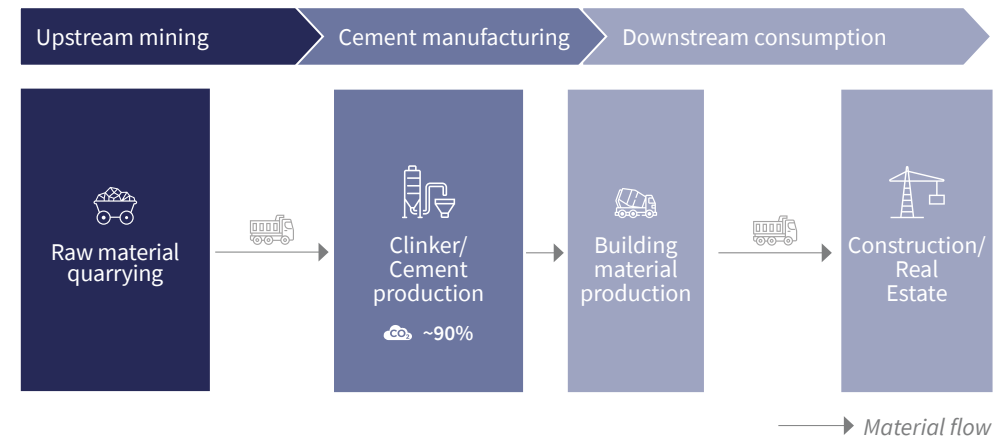
- Efficiency in construction and concrete manufacturing, limiting cement demand;
- Greater energy efficiency in cement production plants;
- Production of cement made with lower clinker content, particularly driven by small operators;
- Use of alternative fuels<sup>(\*)</sup> in cement production, reducing fossil fuel combustion;
- Use of CCUS technologies to abate the remaining emissions, a solution favored by historical manufacturers.

The remaining emissions are tackled through the global decarbonisation of the power sector, and CO<sub>2</sub> recombination<sup>(\*\*)</sup> according to various sectoral scenarios.

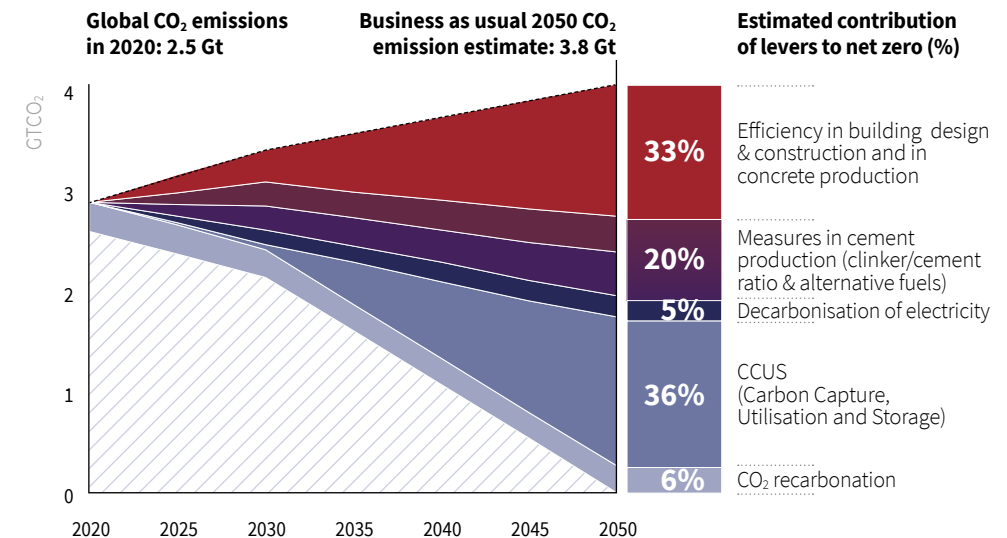
Due to technology maturity levels, net zero scenarios define a decarbonisation timeline relying on evolving technologies<sup>(4)</sup>:

- By 2030, production processes, energy efficiency improvement, fossil fuels reduction and clinker/cement ratio reduction will be critical;
- By 2050, CCUS will be essential for reducing emissions intrinsic to cement production. CCUS will require R&D investment before being deployed commercially after 2030.

## CEMENT SECTOR'S VALUE CHAIN AND EMISSIONS MATERIALITY<sup>(5)</sup>



## CONTRIBUTION OF DECARBONISATION LEVERS TO MEET NET-ZERO OBJECTIVES<sup>(\*\*)(4)</sup> (2020–2050)



(1) IEA, *Net Zero Roadmap: A global Pathway to Keep the 1.5°C Goal in Reach*. (2) IEA, *Net Zero by 2050 report*. (3) World Economic Forum, *Net-Zero Industry Tracker, 2022*. (4) Global Cement and Concrete Association, *Getting to net zero*. (5) Blunomy analysis. (\*) Alternative fuels are derived from non-primary materials i.e. waste or by-products; it can be biomass, fossil or mixed (fossil and biomass) alternative fuels. (\*\*) Recarbonation is the process of CO<sub>2</sub> uptake by concrete. (\*\*\*) GCCA decarbonisation pathway also considers the concrete sector, which represents a minor share of the cement/concrete sector.



Coal



Oil &amp; Gas



Power



Cement



Steel



Aluminium



Automotive



## 2. ALIGNING CEMENT

The cement sector's decarbonisation requires improving energy and material efficiency, using low-emissions fuels and investing in new technologies.

### Scope

#### SECTOR BOUNDARY

##### Cement manufacturing companies

The scope of this portfolio focuses on counterparties active in the cement manufacturing segment which is the most material within the cement value chain.

#### EMISSIONS SCOPE

The indicator covers scope 1 & 2 emissions for cement manufacturers. These are the emissions generated from thermal combustion to produce clinker, electricity generation for the kiln, and the grinding and blending of materials. Scope 1 emissions are measured on a gross basis. This includes emissions from the burning of substitution fuels such as different types of waste (e.g., old tires, grease, organic solvents, painted wood) as part of the calcination process.

#### FINANCING ACTIVITIES

All loan-related products are included.  
General purpose and dedicated loans are included.

### Methodology

#### CALCULATION METHODOLOGY

##### PACTA methodology for Banks

The portfolio intensity is calculated by weighting each counterparties' respective intensity by their exposure in the portfolio.

#### SCENARIO

##### IEA's NZE Scenario

As the IEA NZE Scenario does not provide sector-specific scope 2 pathways, the Group uses the scope 2 decarbonisation pathway developed by SBTi in consultation with the IEA.

#### METRICS

Emission intensity metric: kg CO<sub>2</sub>e/t cement

$$\frac{\text{Scope 1 \& Scope 2 emissions (kgCO}_2\text{e)}}{\text{Cement production (t cement)}}$$

#### KEY ASSUMPTIONS AND LIMITATIONS

The IEA NZE Scenario and data from Asset Impact are expressed in tonnes of cement produced. However, company reported data is mostly in terms of cementitious products, and thus includes production from cement substitutes such as slag. The difference is likely to be small: in the order of 1% according to 2018 data from the GCCA Getting the Numbers Right project. The data provided by Asset Impact excludes non-CO<sub>2</sub> greenhouse gases; however, the exclusion has minimal impact given that CO<sub>2</sub> is the most material greenhouse gas for the sector.

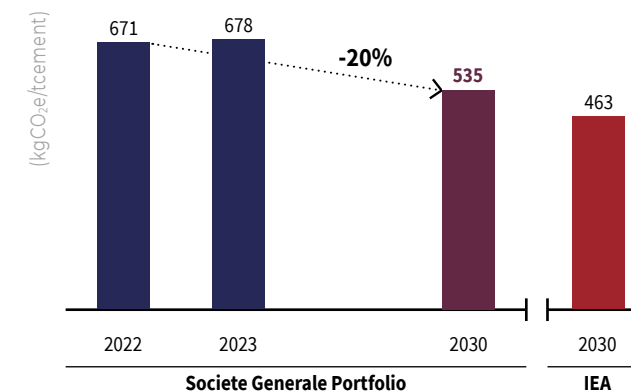
### Target & Progress

#### BASELINE & TARGET

kgCO <sub>2</sub> e/t cement	2022	2030	% reduction
<b>Societe Generale Portfolio</b>	671	535	20%
<b>IEA's NZE 2050</b>	580	463	19%

The target is above the IEA NZE Scenario because there is currently no consensus on the level of deployment of CCUS in 2030: the IEA Scenario is based on more optimistic assumptions than the industry's assessment.

#### PROGRESS



#### DATA PROVIDERS

Company reports, Asset Impact



Coal



Oil &amp; Gas



Power



Cement



Steel



Aluminium



Automotive



### 3. TAKING ACTION TO SHIFT

#### Clients and assets

- Under **“The Shift”** initiative, bankers from different business lines and geographies have been working together to:
  - Build expertise on cement’s decarbonisation challenges and new industrial processes, energy efficiency and technologies (CCUS, Hydrogen...) to decarbonise the sector;
  - Identify the **emerging leaders of tomorrow** that are developing low-carbon cement and innovative building material solutions that can reduce the carbon footprint of the real estate & infrastructure sectors.
- Societe Generale’s clients are major cement manufacturers that have, in most cases, defined CO<sub>2</sub> emissions targets and are already engaged in their decarbonisation journey. Bankers maintain a close dialogue with clients on their transition strategy to understand their needs and challenges.
- The **Group has developed a corporate transition assessment tool** for the construction and building materials sector, including cement, to further help bankers have constructive dialogues with clients around their decarbonisation strategies.
- Working on corporate and/or project finance, we structure **“brown-to-green” financing solutions** to support corporate or site-level decarbonisation of key cement clients as well as large-scale brownfield retrofits and greenfield zero emissions. We structure Sustainability-linked bonds or loans with incentives based on ambitious transition indicators (carbon intensity, absolute emissions, etc.), as well as green use-of-proceeds financing.

#### Flagship deals

Societe Generale acted as ESG Structuring Advisor and Active Bookrunner on the first Sustainability-linked bond in the building materials industry for EUR 850 million which was issued by **HOLCIM**. The bond’s coupon was linked to a target to reduce emissions to 475 kgCO<sub>2</sub> per tonne of cementitious material by 2030. Since then, Societe Generale has assisted LafargeHolcim in updating the framework on several occasions, most recently in August 2023, to reflect the latest sustainability targets and expand the framework to also cover green use of proceeds financing, aligned with the EU taxonomy’s criteria for manufacturing of cement.



**GREGORY GOSSE**

HEAD OF DIVERSIFIED INDUSTRIES

*“Cement being critical in the construction industry, but also one of the most emitting building materials, industry players have had to massively invest in the reduction of their environmental footprint over the past few years. Most of our clients have set 2030 objectives for the emissions intensity of their cement production activities. Two strategies - often combined - have been followed to date:*

- *Organically reducing the emissions intensity of cement through investments (e.g. reduction of the clinker-to-cement ratio, substitution of fossil fuels with alternative fuels, increased usage of alternative raw materials, renewable energy, as well as new technologies such as carbon capture or electrification solutions);*
- *Product portfolio rebalancing through the acquisition of companies active in light materials (insulation, waterproofing, wood-based materials) or recycling, and selling certain cement operations.*

*We have supported our clients on both strategic avenues with a recognised deep understanding of the industry reshaping that is accelerating.”*

Societe Generale has a historical presence in some emerging markets such as in Africa, where the infrastructure deficit remains a challenge.

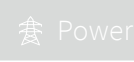
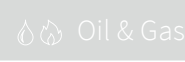
Financing the development of such infrastructure and the production of critical building materials like cement is an integral part of Societe Generale’s commercial and impact strategies on the continent.

In April 2022, Societe Generale acted as arranger and lender for a EUR 52 million loan to **CBI Ghana** to finance the construction of the first African clay calciner to partially substitute clinker cement, leading to a significant reduction of the CO<sub>2</sub> intensity. Societe Generale’s support will enable CBI Ghana’s cement production to achieve levels of sustainability in line with EU Taxonomy requirements.



In February 2023, Societe Generale was one of the banks in the financing (EUR 242 million facility) arranged by the IFC to finance **Sococim Industries** – the largest integrated cement producer in Senegal and a subsidiary of the French group Vicat – in the construction of a more performant production line. Societe Generale Senegal will act as administrative agent to manage the local currency financing with the other lenders.





# 1. SECTOR DYNAMICS

DECARBONISATION  
LEVERS (see page 15)



The steel sector represents 7% of energy-related CO<sub>2</sub> emissions<sup>(1)</sup>. According to the IEA NZE Scenario<sup>(2)</sup>, the carbon intensity of the sector must decrease by 24% by 2030 compared to 2022.

## Sector overview

Steel is an essential resource in many sectors including construction, automotive, shipping, aviation, machinery and consumer goods. Population growth and economic development in emerging countries drive steel demand. The World Economic Forum projects global steel demand to rise by 30%<sup>(1)</sup> by 2050<sup>(3)</sup>. Steel is also a key component of low-carbon technologies (e.g. wind turbines).

## Emission sources

Steelmaking emissions are linked to fuel consumption and iron reduction processes. Three production routes exist and present different emission profiles:

- Blast Furnace – Basic Oxygen Furnace (BF-BOF), relying on coal and coke for energy and process purposes;
- Direct Reduced Iron – Electric Arc Furnace (DRI-EAF), relying on natural gas or coal and electricity;
- EAF-Scrap, a secondary EAF production route using scrap metal as an input and relying on electricity.

## Decarbonisation levers<sup>(4)(5)(6)(7)(8)</sup>

The IEA NZE Scenario and industrial roadmaps identify three levers to reduce the steel industry's emissions:

- Reduction of steel primary production through material efficiency and scrap use;

- Diversification of production processes towards less CO<sub>2</sub>-intensive routes;
- Scaling of carbon capture technologies to tackle residual emissions.

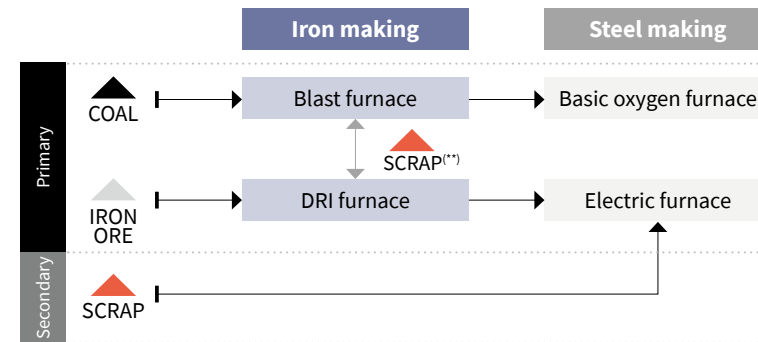
### Resource efficiency and circularity:

the IEA forecasts that material efficiency in steel-dependent sectors (e.g. manufacturing of lighter vehicles in the automotive industry) could reduce demand by around 20% by 2050<sup>(4)</sup>. Change in material inputs with scrap use and secondary steel production are also essential for the transition of steel-consuming industries.

**Fuel or process switch:** primary steel production will be required to meet 60% of steel needs by 2050<sup>(3)</sup>. Diversification of production routes towards less carbon-intensive ones, switching from coal to other reducing agents such as hydrogen can reduce the steel's industry carbon footprint. Technological innovation and hydrogen-based production routes, for which project announcements are increasing, will be crucial to unlock the potential of so-called 'green steel'.

**CCUS:** this technology is seen as a complement to the deployment of low-carbon production routes. However, they will play a limited role in decarbonising the steel sector before 2030 but will be scaled up thereafter onwards.

## STEELMAKING PROCESSES AND ASSOCIATED CO<sub>2</sub> EMISSIONS<sup>(3)(8)</sup>

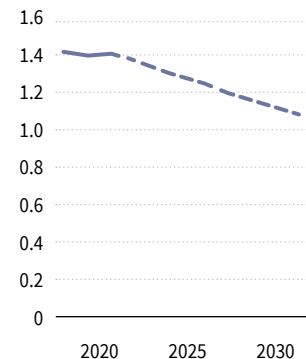


**BF-BOF:**  
70% of global production  
2.3 tCO<sub>2</sub>e/t steel

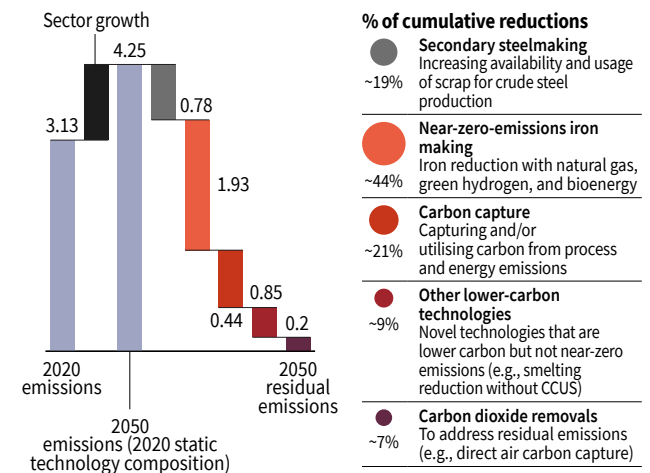
**DRI-EAF:**  
5% of global production  
1.4 tCO<sub>2</sub>e/t steel

**Scrap EAF:**  
25% of global production  
0.6 tCO<sub>2</sub>e/t steel

## DIRECT CO<sub>2</sub> INTENSITY (TCO<sub>2</sub>/TSTEEL)<sup>(1)</sup> OF THE IRON AND STEEL SECTOR IN THE IEA NET ZERO SCENARIO, 2020-2030



## ANNUAL CO<sub>2</sub> EMISSIONS (SCOPE 1 & 2)<sup>(6)</sup> REDUCTION PER DECARBONISATION LEVER (GT CO<sub>2</sub>) IN THE MISSION POSSIBLE PARTNERSHIP STEEL SCENARIO, 2020 - 2050<sup>(6)</sup>



(1) IEA, Net Zero Roadmap: A global Pathway to Keep the 1.5°C Goal in Reach. (2) IEA, Iron and Steel. (3) World Economic Forum, Net-Zero Industry Tracker, 2022. (4) IEA, Net Zero by 2050, 2021. (5) IEA, Iron and Steel Technology Roadmap, 2020. (6) Mission Possible Partnership – Making Net-Zero Steel Possible. (7) OECD, Assessing steel decarbonisation progress, 2022. (8) IEA, Energy Technology Perspectives, 2020. (\*) In the IEA NZE Scenario, considering material efficiency measures, steel demand grows by 12% by 2050. (\*\*) Scrap represents 15–25% of metallic input for primary path production.





Coal



Oil &amp; Gas



Power



Cement



Steel



Aluminium



Automotive



## 2. ALIGNING STEEL

Given the various decarbonisation levers applicable to the sector, we set our target using the Sustainable STEEL Principles alignment score to adequately address primary and secondary steel pathways.

### Scope

#### SECTOR BOUNDARY

##### Steel manufacturing companies

The Sustainable STEEL Principles (SSP) define an in-scope counterparty as an entity that (i) produces a minimum of 250 kilotons p.a. of crude steel at group-level and

(ii) generates 20% or more of total revenues through crude steelmaking activities at group-level.

Societe Generale applied the thresholds recommended by the SSP. Client eligibility and inclusion in the alignment score calculation was ultimately confirmed by its presence in the CRU database which assured the availability of data for that client.

#### EMISSIONS SCOPE

For the steel sector, a fixed-boundary system as per the SSP is used covering scopes 1, 2 and a portion of scope 3 emissions, depending on the level of vertical integration (specifically category 1 and 10). These are the emissions generated from raw material preparation, ironmaking, steelmaking, and auxiliary processes. Emissions from upstream (i.e., iron and coal mining) and downstream activities (i.e., beyond coating) are not covered by the indicator and the Scenario benchmark because they represent a relatively small portion of total steel sector emissions.

#### FINANCING ACTIVITIES

All loan-related products are included.

General purpose and dedicated loans are included.

### Methodology

#### CALCULATION METHODOLOGY

Sustainable STEEL Principles (recognised as a valid methodological framework by NZBA).

#### SCENARIO

IEA's NZE Scenario

#### METRICS

##### Portfolio Alignment Score as defined by the SSP.

The alignment score distinguishes the primary and the secondary steel pathways and evaluates a borrower's alignment against two 1.5°C Scenarios (the IEA NZE Scenario and the Mission Possible Partnership's Technology Moratorium Scenario - MPP TM).

- A score of zero or below zero means that a company is aligned with the IEA NZE and MPP Scenarios;
- A score between zero and one means that it is aligned with the MPP TM Scenario only; and
- A score above one means that it is misaligned with a 1.5°C scenario.

#### KEY ASSUMPTIONS AND LIMITATIONS

The definition of the client scope is complex as identifying clients which actually produce crude steel is not evident given the varying degrees of integration and diversification of players along the value chain.

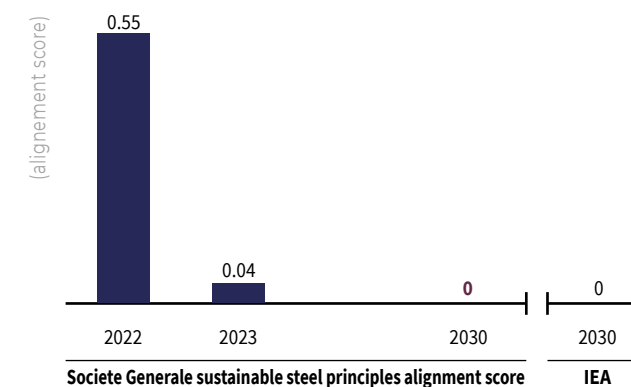
Data quality remains a challenge and the calculation of the score is very sensitive to the scrap share and intensity assumptions. As such, restatements might be necessary in the coming years to refine the scope, data and calculations.

### Target & Progress

#### BASELINE & TARGET

	Baseline NA	Target 2030
Alignment score (%)		
Societe Generale Portfolio	0.55	0

#### PROGRESS



#### DATA PROVIDERS

CRU for 2022 with the aim to collect data directly from clients starting in 2023



Coal



Oil &amp; Gas



Power



Cement



Steel



Aluminium



Automotive



### 3. TAKING ACTION TO SHIFT

#### Clients and assets

- Under **“The Shift”** initiative, bankers from different business lines and geographies have been working together to:
  - Build expertise on steel decarbonisation levers such as hydrogen based and DRI solutions;
  - Identify the **emerging leaders of tomorrow** that are developing new low carbon solutions for the steel sector.
- Leveraging on the expertise built, bankers maintain a close dialogue with clients on their transition strategy, to understand their needs and challenges in order to accompany them in their transition.

#### Industry and peers

- The Group joined the Sustainable STEEL Principles as a vice-chair and founding member in collaboration with the Rocky Mountain Institute and five other major lenders in the global steel industry. Under the Sustainable STEEL Principles framework, the Group committed to disclosing the carbon emissions of its lending portfolio, and taking a leadership role in supporting its clients with net-zero transition plans and financial advisory.
- Societe Generale contributed to in the NZBA steel sector working group as co-chair to define guidelines for the financial sector to align their steel industry lending portfolios. This working group endorsed the Sustainable STEEL Principles as one avenue for achieving banks' NZBA commitments for the steel sector.

#### Flagship deals

In 2023, **Societe Generale acted as Lead Advisor on the Senior and Junior debt facilities, Senior Mandated Lead Arranger (SMLA) and Lender to H2 Green Steel**, adding a material credential to our financing platform dedicated to supporting the decarbonisation of heavy industries.

In its first phase, the project will produce 2.5 million tonnes of green steel. By replacing coal with green hydrogen powered by renewable electricity, the project will abate up to 95% of the carbon emissions compared to the traditional blast-furnace steelmaking process.



In 2024, **Societe Generale acted as the Sole Financial Advisor to ArcelorMittal** for the acquisition of a c. 28.4% of the voting rights and c.27.5% of the share capital of Vallourec.

**“Vallourec is a quality, high added-value tubular business, with established positions of strength in the attractive Brazilian and US markets.** As a producer of premium tubular solutions, it has **a critical role to play in the energy transition**, producing vital products for hydrogen, CCS and geothermal applications, for which demand is



expected to grow. It also has **a comparatively low carbon footprint with ambitious improvement targets.** We look forward to being part of the company's future.”

Aditya MITTAL, CEO, ArcelorMittal



**LENAIG TRENAUX**  
GLOBAL SECTOR HEAD  
– BATTERY, MINING AND INDUSTRIES

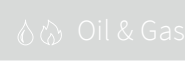
*“As a founding member of the SSP and the NZBA,*

*Societe Generale is committed to the decarbonisation of the steel industry.*

*Our ambition is to accompany our existing clients as they implement their transition strategies while also delivering tailor-made financing solutions to low-carbon ventures.*

*H2 Green Steel is the emblematic example of how we support innovative emerging leaders to achieve this purpose.*

*The work we have done together to structure the debt package over the past years well illustrates how we collaborate with our clients to achieve our common ambition for a low carbon steel industry.”*



# 1. SECTOR DYNAMICS

DECARBONISATION  
LEVERS (see page 15)



Aluminium is a highly energy-intensive material, but it is critical for the energy transition. The IEA NZE Scenario forecasts a rising demand for aluminium to support low-carbon technology deployment<sup>(1)</sup>. Decarbonising its production will thus be key to reaching climate objectives.

## Sector overview

Aluminium is used in multiple industries: construction, transport, power infrastructure, machinery and packaging. Several clean energy technologies also rely on aluminium<sup>(2)</sup>:

- Solar PV – As technology now stands, there is - and will be - no solar power without aluminium, which accounts for over 85% of solar PV technologies<sup>(3)</sup>;
- Electric vehicles - for lighter vehicle design and battery storage;
- Electricity networks and infrastructure.

Demand for aluminium is thus forecast to increase by 80% by 2050<sup>(4)</sup>. Due to the limited availability of aluminium scrap, secondary production cannot meet the demand. Primary aluminium will still be needed to meet almost 50% of aluminium demand in 2050<sup>(4)</sup>.

## Emissions sources

Aluminium manufacturing is a highly emissive process with three main sources of emissions<sup>(5)</sup>:

- Thermal energy consumption for refining, accounting for ~10% of emissions;
- Electricity consumption for electrolysis<sup>(6)</sup>, accounting for ~62% of emissions;
- Direct emissions during the electrolysis process due to the disintegration of carbon-based anodes, accounting for ~9% of emissions.

## Decarbonisation levers

Four main levers exist<sup>(7)</sup>:

- Circularity: material efficiency and recycling;
- Energy (electricity and thermal energy) decarbonisation;
- Process emissions mitigation;
- CCUS.

**Circularity:** Global scrap collection rates are high (around 75% for end-of-life scrap<sup>(8)</sup>) but improving recycling channels will help reduce the need of primary supply and associated emissions. Some pure players are leading the market development through partnerships with aluminium consumers.

**Energy decarbonisation:** Decarbonising the power used for electrolysis is the main decarbonisation lever with the potential to cut 60%-75% of primary production emissions according to industrial scenarios. The ability to activate this lever is dependent on the electricity mix of the country in which the aluminium is produced. But some players also invest in captive power production capacity, particularly in Asia and in the Middle-East. The full decarbonisation of aluminium smelting requires additional technology to be upscaled<sup>(9)</sup>:

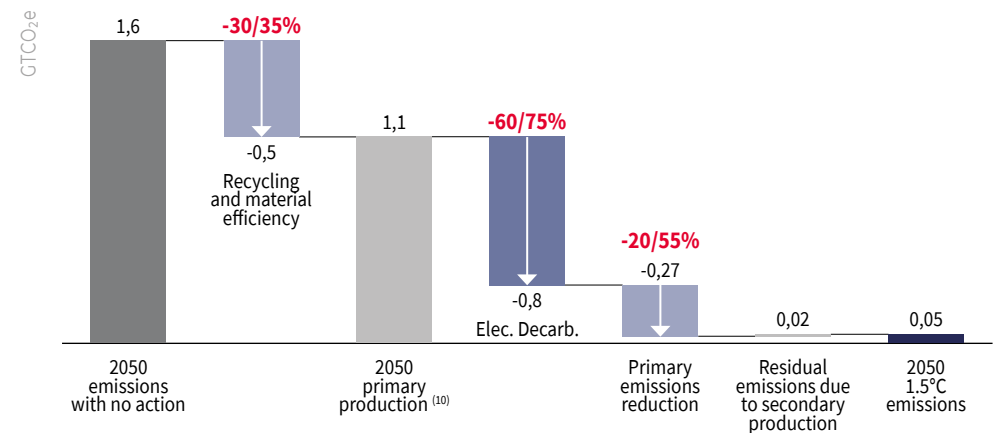
- Developing inert anodes limiting direct electrolysis process emissions;

- Implementing CCUS technologies for residual emissions (although more difficult than in sectors like cement); and
- Switching boilers & calciners to electricity or green hydrogen.

## DIRECT AND INDIRECT EMISSION INTENSITY OF GLOBAL PRIMARY ALUMINIUM PRODUCTION (2021, TCO<sub>2</sub>E/T)<sup>(5)</sup>



## CONTRIBUTION OF DECARBONISATION LEVERS TOWARDS IEA'S NET ZERO SCENARIO<sup>(7)</sup>



(1) IEA, Net Zero by 2050 report. (2) IEA, Mineral Requirements for clean energy transitions. (3) World Bank, Competitiveness of Global Aluminium Supply chain under carbon pricing scenarios for Solar PV, 2023. (4) World Economic Forum, Net Zero Industry Tracker, 2022. (5) International Aluminium Institute, Greenhouse Gas Emissions Intensity, 2022. (6) Aluminium production is dominated by China (57% of 2021 production), resulting in a high carbon intensity of electricity used for electrolysis at a global level. (7) International Aluminium Institute, Aluminium Sector Greenhouse Gas Pathways to 2050, 2021. (8) IEA, Aluminium report. (9) IEA, Aluminium report. (10) 2050 Primary production represents the Aluminium sector's emissions in a scenario with scrap production aligned with IEA's Net Zero Scenario, but CO<sub>2</sub> intensity at 2018 levels.



Coal



Oil &amp; Gas



Power



Cement



Steel



Aluminium



Automotive



## 2. ALIGNING ALUMINIUM

The carbon intensity of production is the most commonly used metric for target setting today and will help steer the aluminium portfolio towards net zero. This indicator is calculated for the aluminium producers in Societe Generale's portfolio according to the fixed-boundary system of the Sustainable Aluminium Finance Framework

### Scope

#### SECTOR BOUNDARY

The Sustainable Aluminium Finance Framework ("SAFF") defines an in-scope counterparty as an entity that produces (i) a minimum of 250 kilotonnes p.a. of cast primary or recycled aluminium, or optionally, (ii) 250 kilotonnes p.a. of shaped aluminium products & generates 50% of revenue from the sale of shaped products.

Societe Generale has only included producers of primary aluminium given its limited exposure to recycling or semi-fabrication clients.

#### EMISSIONS SCOPE

Scopes 1, 2 & 3 upstream emissions are included in the boundary as defined by the SAFF fixed boundary system for primary and recycled production. This includes emissions associated with the extraction of fuels for process heat, the generation of electricity (including the extraction of fuels to generate this electricity) and the production of ancillary materials. Exclusions consist of scrap sorting and scrap pre-treatment related to recycling, transport and semi-fabrication.

#### FINANCING ACTIVITIES

All loan-related products are included.

General purpose and dedicated loans are included.

### Methodology

#### CALCULATION METHODOLOGY

PACTA methodology for Banks

The portfolio intensity is calculated by weighting each counterparties' respective intensity by their exposure in the portfolio.

#### SCENARIO

Two roadmaps are used in tandem for primary production as proposed by the SAFF: (i) **International Aluminium Institute (IAI) 1.5°C Scenario**: a top-down scenario which covers the entire aluminium value chain from mining through semi-fabrication and includes most scope 3 emissions. (ii) **MPP Aluminium Sector Transition Strategy (MPP STS)**: a bottom-up model covering the refining, smelting, and anode production processes related to primary aluminium production. The **IEA NZE Scenario** for the aluminium sector is not the most relevant as the IEA only covers the sector's direct emissions (scope 1) and does not address electricity-related emissions (scope 2).

#### METRICS

Emission intensity in tonnes of CO<sub>2</sub> equivalent per tonnes of aluminium produced: (tCO<sub>2</sub>e/tAl). As a participant of the SAFF development, Societe Generale is assessing the possibility of using the SAFF alignment score in the future.

#### KEY ASSUMPTIONS AND LIMITATIONS

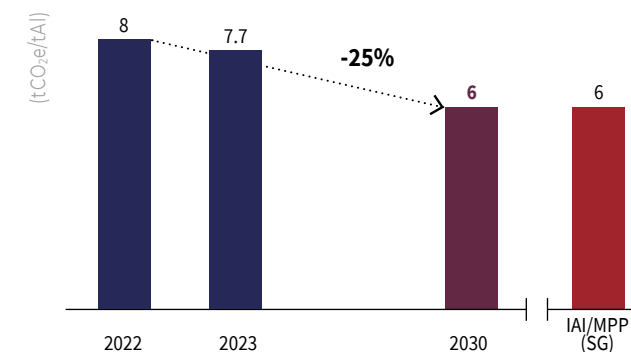
The intensity indicator does not consider the wide range of intensities within the sector, nor the strong correlation between an aluminium producer's intensity and the intensity of the power grid in its country of operation. This indicator is also volatile for banks as their portfolios evolve over time and the weight of their exposure to the highly different intensities found across the sector changes, thus impacting its average intensity.

### Target & Progress

#### BASELINE & TARGET

tCO <sub>2</sub> e/tAl	2022	2030	% reduction
Societe Generale Portfolio	8.0	6.0	25

#### PROGRESS



#### DATA PROVIDERS

Calculations are based on publicly disclosed client data with limited granularity and transparency





Coal



Oil &amp; Gas



Power



Cement



Steel



Aluminium



Automotive



### 3. TAKING ACTION TO SHIFT

#### Clients and assets

- Under the Shift program, bankers from different business lines and geographies have been working together to:
  - Build in-depth expertise in the various decarbonisation routes of the aluminium supply chain;
  - Identify the emerging leaders of tomorrow that are leading the charge in new growth initiatives in the segment.
- Leveraging on the expertise built, bankers maintain a close dialogue with clients on their transition strategy, to understand their needs and challenges in order to accompany them in their transition.
- The Group plans to develop a corporate transition assessment tool (TOP) for the metals and mining sector, including aluminium helping further bankers to have a constructive dialogue with clients around their decarbonisation strategy.

#### Industry and peers

- Since 2022, Societe Generale has been part of the Aluminium Climate-Aligned Finance (CAF) Working Group as a founding member, alongside top lenders to the aluminium sector and in consultation with leading aluminium and climate organisations, such as the International Aluminium Institute and the Aluminium Stewardship Initiative. The Working Group drafted a collective framework defining a common set of methodological principles to measure, benchmark, and disclose the climate alignment of aluminium lending portfolios in line with a 1.5°C scenario.
- The Working Group comprised senior metals and mining leaders from each participating financial institution and was facilitated by RMI's Center for Climate-Aligned Finance.
- The framework will create consistency and transparency in both reporting and measuring progress against climate targets. Financial institutions that adopt the Sustainable Aluminium Finance Framework will be able to assess the emissions of their aluminium loan books and work with their clients to report their emissions, fund lower-carbon solutions, and support investments in new technologies.
- The Sustainable Aluminium Finance Framework was published in December 2023. More information on the following link: [https://climatealignment.org/wp-content/uploads/2023/11/RMI-Sustainable-Aluminium-Finance-Framework\\_report\\_111623.pdf](https://climatealignment.org/wp-content/uploads/2023/11/RMI-Sustainable-Aluminium-Finance-Framework_report_111623.pdf)

#### Flagship deals

In February 2024, Societe Generale closed \$375mIn sustainability-linked facilities for Aluminium Dunkerque (one of the largest aluminium smelters in Europe) acting as Lead Arranger, Bookrunner and Sustainability Coordinator.

Those facilities contain interest rate benefits for the Company upon achieving certain environmental criteria including reductions in carbon emissions and water consumption.

Acting in one of most carbon intensive industries, Aluminium Dunkerque signed its Ecological Transition Contract with the French

government in November 2023, with ambition to reduce up to 59% of Aluminium Dunkerque's emissions by 2030, and between three-fourth and all of its direct emissions by 2050.



**LENAIG TRENAUX**  
GLOBAL SECTOR HEAD –  
BATTERY, MINING  
AND INDUSTRIES

*“ESG and sustainability objectives are embedded*

*in Societe Generale's corporate purpose. Our ambition is to support decarbonisation goals of stakeholders involved in this sector. We are proud to be part of the driving force to shape the future of a decarbonised aluminium industry.”*

# 1. SECTOR DYNAMICS

The automotive sector (cars and vans) represented 10% of energy-related global CO<sub>2</sub> emissions in 2022<sup>(1)</sup>. Alignment with climate objectives requires a reduction of 42% of the sector's CO<sub>2</sub> emissions from 2022 to 2030<sup>(1)</sup>.

## Sector overview

The IEA NZE Scenario forecasts an increase in the global passenger car fleet of more than 60% by 2050, reaching close to 2 billion vehicles<sup>(2)</sup>. Governments will work towards all sales of new cars and vans being zero emission by 2040 or earlier, or by no later than 2035 in leading markets. It will create a policy pressure on automotive markets to develop the manufacturing of low-carbon technology (BEV, PHEV, FCEV<sup>(\*)</sup>) vehicles<sup>(3)</sup>. In Europe for instance, the Parliament voted a plan to ban the sale of new petrol and diesel engine cars from 2035. The IEA NZE Scenario requires a 100% share of low-carbon technology<sup>(\*\*)</sup> in new vehicle sales by 2050<sup>(2)</sup>.

## Emission sources<sup>(4)(5)(6)</sup>

Light-duty vehicle emissions comprise:

- “Well-to-Wheel” emissions including:
  - “Well-to-tank” emissions linked to upstream fuel production – Fuel Supply;
  - “Tank-to-wheel” emissions linked to fossil fuel combustion – Tailpipe.
- Manufacturing emissions linked to the material production and manufacture of vehicles.

**“Well-to-Wheel” emissions:** internal combustion engine vehicles’ emissions mostly come from fuel supply and

combustion, accounting for 65%-80% of total life-cycle emissions.

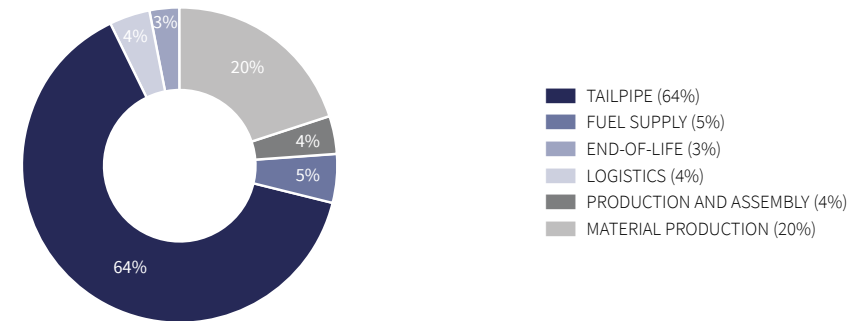
Battery and fuel cell electric vehicles have different emission profiles, as they have no “tank-to-wheel” emissions linked to fuel combustion. However, they generate indirect emissions linked to the generation of electricity that powers the vehicle. Thus, their carbon footprint varies depending on the electricity mix in their geography of use.

**Manufacturing emissions:** the remaining emissions from the automotive sector are linked to the production and maintenance of the vehicles themselves. This encompasses the manufacturing of vehicles by car manufacturers and the manufacturing of batteries in giga factories. These emissions depend on the propulsion technology:

- For internal combustion engine vehicles, they represent around 10% of total life-cycle emissions;
- For electric vehicles, they represent between 40 and 50% of total life-cycle emissions.

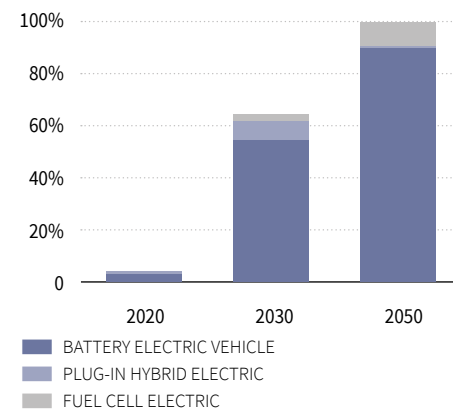
These emissions come from the manufacturing of components and production of raw materials (e.g. steel, aluminium, other metals and plastics). As such, reducing the carbon footprint of the supply chain is key to further reducing light-duty vehicles’ emissions by 2050.

## BREAKDOWN OF INTERNAL COMBUSTION ENGINE VEHICLES’ EMISSIONS<sup>(4)</sup> (%)

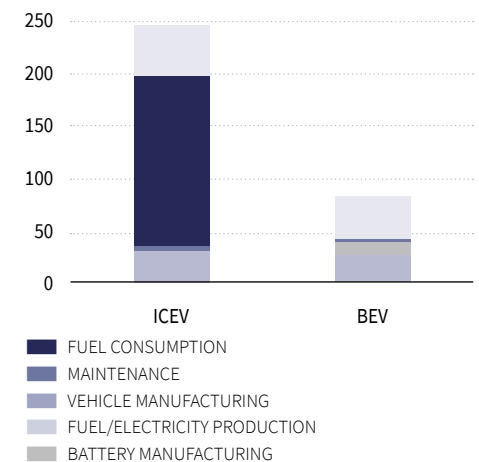


## BREAKDOWN OF INTERNAL COMBUSTION ENGINE AND BATTERY ELECTRIC VEHICLES’ EMISSIONS AND SHARE OF LOW-CARBON VEHICLES SALES EVOLUTION IN THE NZE SCENARIO<sup>(2)</sup>

### Share of low-carbon technology vehicles sales (% of total sales)<sup>(5)</sup>



### Emission intensity of ICEV<sup>(\*\*\*)</sup> and BEV<sup>(6)</sup> registered in Europe (2021, gCO<sub>2</sub>e/km)



(1) IEA, *Cars and Vans*. (2) IEA, *Net Zero by 2050*. (3) IEA, *EV outlook 2023*. (4) McKinsey, *The zero-carbon car*. (5) IEA, *Net Zero Roadmap: A global Pathway to Keep the 1.5°C Goal in Reach*.

(6) International council on clean transportation. (\*) BEV: Battery Electric Vehicle// PHEV: Plug-in Hybrid Electric Vehicle// FCEV: Fuel Cell Electric Vehicle. (\*\*) Low-carbon technology vehicles are defined as vehicles with low to zero tank-to-wheel emissions. They rely on electric propulsion. (\*\*\*) ICEV: Internal Combustion Engine Vehicle.

# 1. SECTOR DYNAMICS

The transition towards electric vehicles is key to decarbonising the automotive sector.

Car manufacturers are at a center stage and must adapt not only their production but also their full supply chain.

## Decarbonisation levers<sup>(1)(2)(3)(4)(5)</sup>

The IEA NZE Scenario relies on three main decarbonisation levers for the automotive sector:

- Technology transition towards electric mobility (EVs, FCEVs);
- Improvements in energy efficiency;
- Behavioural changes.

**Energy switch:** technology transition towards electric mobility reduces demand for fossil fuels. In the IEA NZE Scenario, the share of EVs in total new vehicle sales reaches 100% in 2050<sup>(1)</sup>. Nevertheless, this transition must be supported by the decarbonisation of the power generation system via the massive deployment of renewable generation sources. Additionally, charging infrastructure development is necessary to foster e-mobility – particularly for light-passenger vehicles. Globally, the stock of new charging points has been growing at a rate of 47% per year between 2015 and 2022<sup>(2)</sup>. The IEA 2023 Scenario update upgrades the role of EVs, reflecting the significant increase of EV sales pushed by policy support and the scale up of manufacturing supply chains. However, biogas and low-carbon hydrogen will play smaller roles in the near and longer terms due to limited accessible resource base and competition for end-uses<sup>(3)</sup>.

**Energy efficiency:** lighter vehicles consume less fuel or electricity over the same distance, improving the fuel efficiency. In the IEA NZE Scenario, fuel efficiency represents a 41%

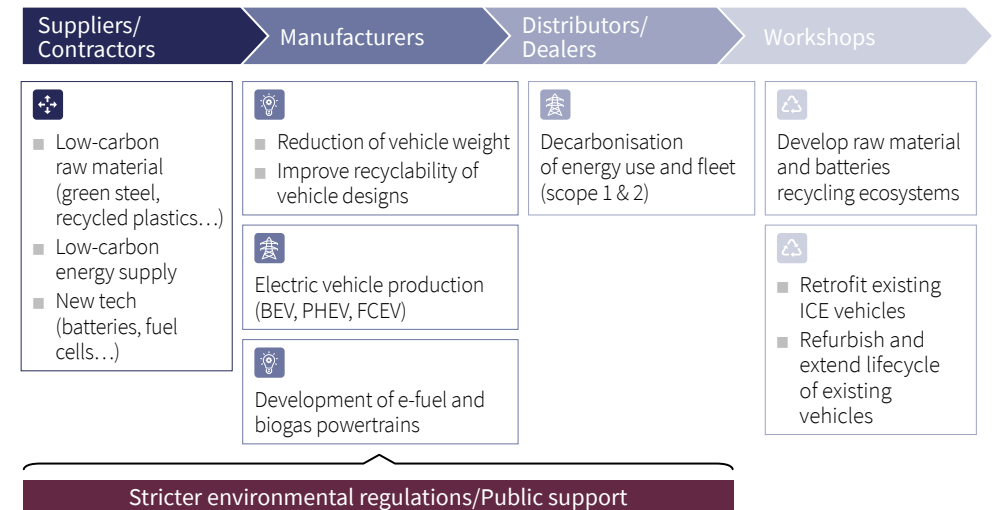
energy consumption reduction lever between 2020 and 2050. However, the share of heavy vehicles and SUVs in total sales continues to increase in Europe by around 2% per year<sup>(4)</sup>.

**Behavioral changes** are actions that energy consumers can take to reduce or eliminate unnecessary or wasteful energy consumption, for example walking, cycling or taking public transportation instead of driving. Changes in behavior depend not only on individual choices, but also on systemic factors such as the availability of infrastructure such as bicycle lanes, public transportation or high-speed rail.

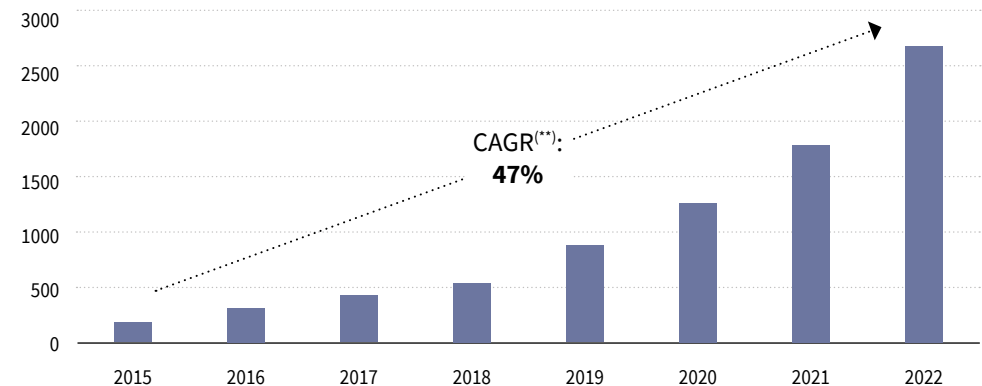
Along the automotive value chain, companies have specific levers to reduce their carbon intensity:

- Car manufacturers are expected to adapt their production lines to produce EVs. They have a specific role to play as changes in car production will have a knock-on effect up and down the value chain, increasing demand for low-carbon fuels and reducing the share of ICEVs in total sales. They can also increase the energy efficiency of the sector with lighter vehicles (design optimisation, switch from steel to aluminium);
- Fuel suppliers should produce low-carbon liquid fuels along with the supply infrastructure. They also can contribute to the large-scale deployment of EV recharging infrastructure and even renewable energy generation capacity to power the infrastructure.

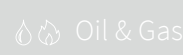
## DECARBONISATION LEVERS FOR AUTOMOTIVE PLAYERS ALONG THE VALUE CHAIN<sup>(4)</sup>



## PUBLICLY AVAILABLE LIGHT-DUTY VEHICLE CHARGING POINTS<sup>(4)</sup> (GLOBAL, THOUSANDS, 2015–2022)<sup>(\*)</sup>



<sup>(1)</sup> IEA, Net Zero by 2050. <sup>(2)</sup> IEA, EV outlook 2023. <sup>(3)</sup> IEA, Net Zero Roadmap: A global Pathway to Keep the 1.5°C Goal in Reach. <sup>(4)</sup> IEA, Cars and Vans. <sup>(5)</sup> International council on clean transportation, 2021. <sup>(\*)</sup> Based on IEA's country submission. <sup>(\*\*)</sup> CAGR: Compound Annual Growth Rate.



## 2. ALIGNING AUTOMOTIVE

Societe Generale's strategy focuses, for the time being, on the vehicle usage phase, which represents more than two thirds of the greenhouse gases emitted over the full life-cycle of ICE vehicles. The emissions scope will likely evolve in the coming years to encompass upstream emissions as the materiality of these emissions increases and dedicated pathways become available.

### Scope

#### SECTOR BOUNDARY

Car manufacturers and their financial captives, with a focus on light-duty vehicles such as cars, vans and light trucks are included. The upstream (e.g., suppliers) and downstream (e.g., dealers) parts of the value chain are excluded.

Consumer Finance and Ayvens will be treated separately and are not included in the boundary.

#### EMISSIONS SCOPE

The indicator covers scope 3 end-use emissions (category 11) for automotive manufacturers. These are the emissions generated during the combustion of the fuels by vehicles (i.e., tank-to-wheel). The metric excludes, to date:

- Scopes 1 & 2 emissions from automotive manufacturers;
- All other scope 3 emissions occurring upstream or downstream of the automotive manufacturer's value chain;
- Upstream emissions related to fuel production and distribution, as well as electricity generation for electric vehicles (i.e., well-to-tank).

The scope of emissions might evolve should data and pathways become available.

#### FINANCING ACTIVITIES

All loan-related products are included.  
General purpose and dedicated loans are included.

### Methodology

#### CALCULATION METHODOLOGY

PACTA methodology for Banks

#### SCENARIO

IEA's NZE Scenario

Currently, the IEA only provides a pathway for tailpipe emissions intensities (in gCO<sub>2</sub>/v-km) with a focus on the stock of vehicles on the road. Societe Generale's target is based on a different metric, the average emissions intensity of new cars sold in a given year. In the absence of a similar metric provided by the IEA to benchmark our target, we compared it with the IEA trajectory between 2020 and 2030 (-47% vs. -51% for Societe Generale's target). We will review our target in the coming years, should the IEA disclose a benchmark based on annual vehicle sales.

#### METRICS

Emission intensity metric: gCO<sub>2</sub>e/v-km, the portfolio is aggregated on an exposure-weighted approach

$$\frac{\text{Scope 3 end-use emissions (gCO}_2\text{e)}}{\text{Vehicle — kilometers (v — km)}}$$

#### KEY ASSUMPTIONS AND LIMITATIONS

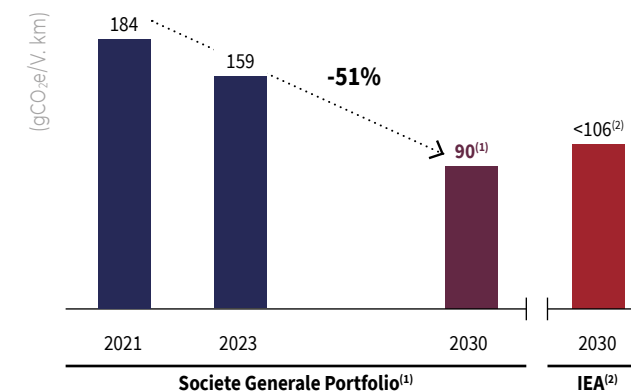
Finding reliable data on car manufacturers' average fleet intensity is key to this exercise. A comparative review of different data providers and company disclosure showed that emissions intensity figures can vary by 20-30% depending on the source. The local norms and calculation methods specific to each market make it difficult to have a transparent and homogenous assessment. Societe Generale will aim to collect the average intensity directly from car manufacturers themselves moving forward to improve accuracy.

### Target & Progress

#### BASELINE & TARGET

gCO <sub>2</sub> e/v-km	2021	2030	% reduction
Societe Generale Portfolio <sup>(1)</sup>	184	90	51%
IEA's NZE 2050 <sup>(2)</sup>		<106	50%

#### PROGRESS



#### DATA PROVIDERS

Asset Impact

<sup>(1)</sup> Societe Generale's target is based on average intensity of new cars sold for a given year. <sup>(2)</sup> The IEA scenario is based on the stock of vehicles on the road.





Coal



Oil &amp; Gas



Power



Cement



Steel



Aluminium



Automotive



### 3. TAKING ACTION TO SHIFT

#### Clients and assets

- Under “**The Shift**” initiative, bankers from different business lines and geographies have been working together to:
  - Build expertise on critical raw material mining, active materials for batteries, gigafactories, battery technologies, electric and hydrogen charging stations and infrastructure, driving assistance systems and battery recycling;
  - Identify **Emerging Leaders** developing low-carbon solutions for the sector such as Fuel Cell Hydrogen or electric batteries.
- We structure equity and debt financing solutions for our clients active in the sector.

- The Group is **developing a corporate transition assessment tool (TOP)** for the automotive sector, further helping bankers to have **constructive dialogues with clients around their journey towards electrification and digital transition.**

#### Industry and peers

Societe Generale joined the Hydrogen Council, which brings together more than 120 member companies from across the various industrial and energy sectors involved in the hydrogen value chain: energy, oil and gas, chemicals, commodities, metals and mining, equipment manufacturers, cars and trucks, and other forms of transport (air, rail, shipping). Societe Generale intends to play an active role in helping its clients through financial and advisory support.



**Nicolas Sanson**

MANAGING DIRECTOR HEAD OF AUTOMOTIVE & MOBILITY

*“Transaction after transaction, our clients appreciate (i) our access to a global investor base for hydrogen and battery opportunities, (ii) our structuring expertise in negotiating the best contractual terms for governance and liquidity and (iii) our experience in assessing the validity of business plans, now under increasing scrutiny.*

*Investor committees are indeed more and more selective and focused on the short-term ability of a company to deliver a breakeven EBITDA or even cash flow, even in fast growing industries such as hydrogen or battery technology.”*

#### Flagship deals



Societe Generale is acting as Exclusive Financial



Advisor to Meridiam on its EUR 200 million **equity investment** in Verkor C. EUR 850 million series C. The financing will fund the construction of **Verkor's first gigafactory in France** with an initial capacity of 16 GWh p. a.

Societe Generale has been mandated by Verkor SAS as **Lead Debt Financial Advisor** in order to advise and



assist the company in securing a project debt finance solution to finance the development of their flagship 16GWh electric vehicle (“EV”) battery manufacturing plant in Dunkirk, France, and which aims at supplying EV batteries to Renault.

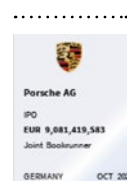
Societe Generale has been mandated by Envision AESC as Debt Financial Advisor in order to advise and



assist the company in securing a project debt finance solution to finance the development of their 9GWh electric **vehicle battery (“EV”) manufacturing plant** in Douai, France, and which aims at supplying EV batteries to Renault.



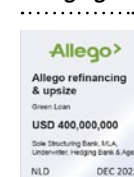
The Group acted in 2023 as Sole Financial Advisor for Stellantis, in its acquisition of a 33.3% stake in Symbio based on a EUR 900 million enterprise value, a leader of **low-carbon hydrogen mobility.**



Societe Generale acted as Joint Bookrunner for Porsche AG, on track to achieve their **ambitious roadmap of 80% electrified vehicles** by 2030. This IPO was the largest in Europe since the beginning of the century.



The Group acted as a Sole Structuring Bank, Mandated Lead Arranger, Underwriter, Hedging Bank and Agent **on a EUR 400 million Green Loan financing package for the electric vehicle charging infrastructure company Allego.**



This deal was the largest senior debt financing in the electric vehicle charging infrastructure segment and **supports Allego in building a pan-European charging network for electric vehicles.**

# 1. SECTOR DYNAMICS

DECARBONISATION  
LEVERS (see page 15)



Accounting for over 80% of the world's trade<sup>(1)</sup>, the shipping sector contributes to 2–3% of global emissions<sup>(1)</sup>. A shift to alternative fuels will be necessary to fully decarbonise the sector. It should achieve a 7% annual decline of emissions between 2022 and 2050 to be in line with IEA's NZE Scenario<sup>(5)</sup>, on the entire value chain.

## Sector overview<sup>(1)(3)(4)</sup>

The shipping sector's emissions could more than double by 2050 as globalisation continues to drive shipping demand, reaching 1.7 GtCO<sub>2</sub> in 2050 in IEA's Reference Technology Scenario if no technological progress is done. The initial strategy of the International Maritime Organisation (IMO) has been strengthened in July 2023, calling for: a strengthening of the requirements on ships' efficiency design and fuel use and a reduction of the international shipping well-to-wake emissions by at least 70% and striving or 80% by 2040, compared to 2008's emission levels with ambition to reach net-zero GHG emission by or around 2050. Shipping, as an efficient freight transport mode with low carbon intensity at 6 gCO<sub>2</sub>/ton-km<sup>(\*\*)(8)</sup>, also holds the potential to contribute to decarbonising the overall transportation sector and reducing the logistics-related emissions of multiple sectors.

## Emission sources<sup>(1)(2)</sup>

International shipping by commercial ships including bulk carriers, container ships and tankers are the key carbon emitters in the sector given their scale of operations which accounts for approximately 85% of the global fleet. The sector's carbon footprint is materially tied to its reliance on carbon intensity oil-based marine fuels (e.g., heavy/light fuel oil, diesel/ gas oil) and other fossil fuels (LNG) which cover more than 99% of its total energy demand.

## Decarbonisation levers<sup>(4)(5)(6)</sup>

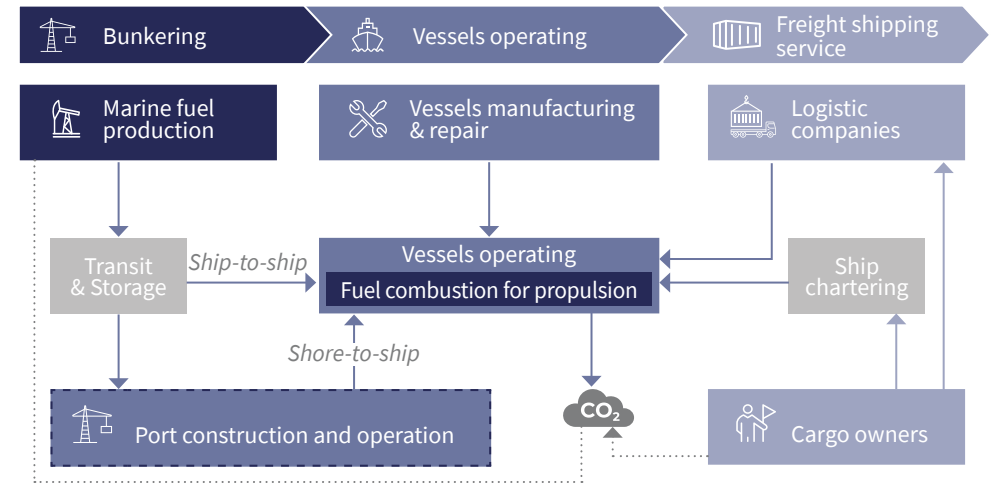
### From now to 2030:

- Optimisation of operational and energy efficiency is the most mature decarbonisation solution (e.g. high efficiency propeller, waste-heat recovery system, slow steaming, route and loading optimisation, etc.);
- Switching to low-carbon fuels such as ammonia or methanol as a primary low-emissions fuel, other biofuels or hydrogen, may play a limited part due to their relatively high costs despite their ability to contribute to major emissions reductions, but other low carbon production means have the potential for scaling up<sup>(\*)</sup>.

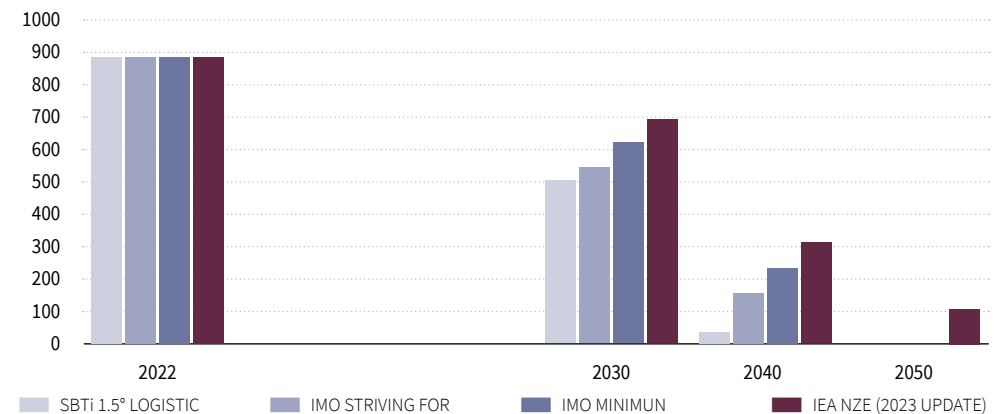
### From 2030 and after:

- According to the IEA Scenario, more than 80% of the energy will be provided by low-carbon fuels, including ammonia, hydrogen and biofuels (including bio-LNG and bio-methanol);
- Scaling-up low-carbon fuel production and infrastructure faces challenges as competition with other sectors (e.g. aviation) is likely. Due to a limited number of low-carbon solutions, this sector is one of the few sectors alongside Aviation that does not achieve zero emissions by 2050 in the NZE.

## SHIPPING SECTOR'S VALUE CHAIN<sup>(9)</sup>



## COMPARISON OF EMISSION REDUCTION TRAJECTORIES<sup>(7)</sup> (Mt CO<sub>2</sub>)



(1) IEA, International Shipping. (2) IEA, Net Zero By 2050. (3) IMO, Revised GHG reduction strategy for global shipping adopted, 2023. (4) IMO, Energy Efficiency of Ships, Fuel Report, 2022. (5) IEA, Net Zero Roadmap: A global Pathway to Keep the 1.5°C Goal in Reach, 2023. (6) SBTi, Science Based Target Setting for the Maritime Transport Sector, 2023. (7) IMO, SBTi, IEA NZE. (8) MIT Climate Portal, Freight Transportation. (9) Blunomy analysis. (\*) In terms of freight transport volume. (\*\*) Other low-carbon production means are under development such as wind propulsion. (\*\*\*) Relative to aviation at 512 gCO<sub>2</sub>/ton-km and road freight at 83 gCO<sub>2</sub>/ton-km.



## 2. ALIGNING SHIPPING

As a signatory of the Poseidon Principles, Societe Generale is committed to implement a trajectory aligned with net-zero GHG emissions by 2050.

### Scope

#### SECTOR BOUNDARY

The boundary are derived from The Poseidon Principles (« PP ») asset based definition which:

- Includes: Cargo and Ferry vessels of 5,000 gross tonnage and above, under the purview of the IMO, and with an established climate trajectory; and
- Excludes: Cruise, Military ships, submarines, inland waterway vessels, and vessels used for production as well as construction.

However, this initial alignment exercise differs from the PP in that it does not include Cruise vessels.

#### EMISSIONS SCOPE

The indicator covers scope 1 and scope 3 category 3 emissions (i.e., well-to-wake emissions, or the “full lifecycle”) for shipowners as per the IMO 2023 Scenarios. These are the emissions generated during: operational activities (i.e., scope 1, or tank-to-wake emissions for shipowners) from fuel combustion on board of a vessel; upstream activities (i.e., scope 3 category 3, or well-to-tank emissions for shipowners) including extraction, cultivation, production, processing, storage, transport and bunkering of fuels.

#### FINANCING ACTIVITIES

- **Included:** credit products and financings secured by a vessel mortgage or a title over the vessel;
- **Excluded:** general corporate propose loans.

### Methodology

#### CALCULATION METHODOLOGY

**Poseidon Principles** (recognised as a valid methodological framework by the NZBA): a carbon intensity metric, the **Annual Efficiency Ratio (“AER”)**, that corresponds to the grams of CO<sub>2</sub>e emitted divided by the distance travelled by the vessel and normalized by its deadweight or gross tonnage (DWT or GT). An AER is the computation of the operational energy efficiency in real conditions of a specific vessel, AER is reported in **unit grams of CO<sub>2</sub> equivalent per tonne-mile** (gCO<sub>2</sub>/dwt-nm).

#### SCENARIO

2023 International Maritime Organisation (IMO) Striving For Scenario. The Group selected this reference Scenario because the IEA NZE Scenario does not provide granularity of assets and is not compatible with the PP.

#### METRICS

**Portfolio Alignment Score as defined by the PP:** the alignment score compares the annual carbon intensity of a vessel with its decarbonisation trajectory defined by the Scenario for the same point in time, a positive alignment score means a vessel is misaligned (above the decarbonisation trajectory); where a negative or zero score means a vessel is aligned (on or below the decarbonisation trajectory).

#### KEY ASSUMPTIONS AND LIMITATIONS

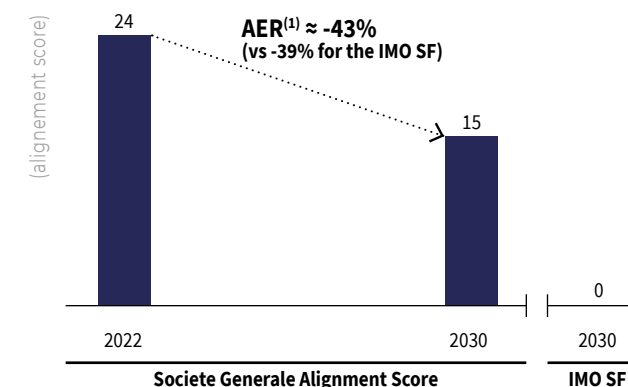
The IMO Striving For trajectory is an approved industry trajectory, supported by the UN and the member states of the IMO. The 2030 target assumes a constant portfolio mix and is, in intensity, more ambitious than the IMO SF scenario. The AER metric is not well suited to cruise vessels strongly penalizing them by the application of the existing formula. If amendments or corrective factors are secured, Societe Generale may expand its alignment perimeter to include cruise vessels.

### Target & Progress

#### BASELINE & TARGET

Alignment score	2022	2030
<b>Societe Generale Portfolio: Cargo + Ferry</b>	24%	15%

#### PROGRESS



#### DATA PROVIDERS

- Manual collection of data from customers Clients (Data concerned are fuel type used, distance traveled and vessel gross tonnage);
- IMO and the Poseidon Principles' guidance provide the carbon factors.

<sup>(1)</sup> The target translates into an AER reduction of 43% in 2030 vs 2022 (vs. 39% industry).

### 3. TAKING ACTION TO SHIFT

#### Clients and assets

- In September 2023, Societe Generale announced that the Group will no longer provide dedicated financial products or services to Floating Production Storage and Offloading ("FPSOs") associated with Greenfield upstream oil and gas fields. After 2025, this exclusion will be extended to any new FPSO financing.
- Under **"The Shift"** initiative, bankers from different business lines and geographies have been working together to:
  - Build expertise on new shipping segments such as transport of captured CO<sub>2</sub> via ships, offshore wind farm installation as well as ammonia and methanol cargo shipping;
  - Identify the **emerging leaders of tomorrow** that are developing new onboard carbon capture, wind powered ships, Hydrogen Fuel Cells and other low-carbon solutions for the sector.
- We are helping clients to secure zero carbon fuel supply by identifying opportunities for the procurement of ammonia, methanol and biofuels.
- The Group is developing a corporate transition assessment tool (TOP) for the shipping sector to help bankers have constructive dialogues with clients around their decarbonisation and transition journeys.
- We prioritize zero-carbon, zero-carbon-ready or low-carbon vessels and the refinancing of vessels whose operational efficiency is in alignment with the Poseidon Principles.

#### Flagship deals

In the first quarter 2024, Societe Generale acted as:

Mandated Lead Arranger, Facility, Security and K-Sure Agent in an USD 565m K-SURE backed green loan financing of six newbuilding methanol propelled 17,200 TEU containerships for **A.P. Møller-Maersk**, aligning with the EU taxonomy, and Active bookrunner on its very successful EUR 1bn dual-tranche Green Bond issue. This is the company's first dual-tranche Euro transaction since 2016 and involves the longest tenor for a EUR benchmark issued by the company. Maersk is intending to allocate the majority of the proceeds to clean transportation, most of which will go towards refinancing methanol dual-fuel container vessels fully aligned with the EU taxonomy.



**Maersk** has been pioneering decarbonisation efforts for maritime, exemplified by the validation of its climate targets by the Science Based Target Initiative (SBTi) as aligned under a 1.5-degree pathway under the new maritime guidance and is paving the way for the whole industry to adopt methanol propulsion by ordering 25 dual-fuel vessels that can operate on green methanol.



#### Industry and peers

- **Societe Generale is one of the founding signatories of the Poseidon Principles**, launched in 2019 together with other banks financing the shipping industry and in collaboration with the Global Maritime Forum. The Poseidon Principles aim to promote a low-carbon future for the global shipping industry by integrating climate decision-making into portfolio management and lending decisions regarding ship financing.
- Societe Generale **has also announced that it has joined the Getting to Zero coalition, which aims to develop and deploy commercially viable deep-sea zero-emission vessels by 2030.**



**PAUL TAYLOR**  
GLOBAL HEAD, MARITIME INDUSTRIES

*"Just as the entire ecosystem bears shared responsibility for emissions, so the burden of the investment to come will be shared. In line with Societe Generale's own internal 'big shift' to focus on the energy transition's value chains, the bank has built the expertise to provide finance and strategic and capital advisory services which are now required across the entire maritime ecosystem."*

In 2023, Societe Generale signed an agreement to support **Eurazeo** as sole advisor with the fundraising and deployment of capital of its new initiative, Eurazeo Maritime Upgrade Fund. This new financing vehicle, in the form of a private debt fund, is dedicated to supporting the transition towards a more sustainable maritime sector. The objective is to enable shipowners to transition towards a greener future through a sale and leaseback scheme that will target both new vessels with alternative propulsion systems and existing on-the-water fleet upgrades.



In 2022, Societe Generale acted AS Green Loan Arranger and Mandated Lead Arranger in the financing of the world first tugboat equipped with a hydrogen dual fuel engine. The tugboat has been ordered by **CMB.TECH**, an entity of Euronav focusing on large marine and industrial applications on hydrogen or ammonia. After successful implementation of the dual fuel hydrogen system, this innovative vessel has been bareboat chartered to the Port of Antwerp for 10 years. The tugboat bears state of the art feature that will help to drastically reduce its carbon emissions, hence contributing positively to the decarbonisation of the Port of Antwerp's activities.





# 1. SECTOR DYNAMICS

DECARBONISATION  
LEVERS (see page 15)



The aviation sector contributed to 2% of global energy-related CO<sub>2</sub> emissions in 2022<sup>(1)</sup>.

Given the forecast increase in aviation demand, new technologies and behavioural changes are needed to align with 1.5°C trajectories.

## Sector overview

After increasing at an average of 2.3% per year from 1990 to 2019, CO<sub>2</sub> emissions from aviation fell by 40% between 2019 and 2020 during the Covid-19 pandemic. In 2022, aviation emissions rose to reach nearly 80% of the pre-pandemic peak in 2019.

Between 2024 and 2050, aviation growth rates are expected to be of about 3% per year. The air traffic growth, especially in emerging markets and developing economies, underlines the need to develop low-carbon technologies over the next decades. While it is recognized as a hard-to-abate sector, member states of the International Civil Aviation Organization (ICAO) agreed in October 2022 on a long-term aspirational goal of net-zero carbon dioxide emissions from aviation by 2050.

Additionally, airlines have, through IATA, their international trade association, collectively committed in 2021 to fly net zero by 2050.

## Emission sources<sup>(3)(4)</sup>

Aircrafts rely on energy-dense liquid fuels with few available renewable alternatives. Aircraft's well-to-wake emissions can be distributed between two main categories:

- Production and distribution of jet fuel, accounting for 16% of total emissions;

- Combustion of jet fuel during flights, accounting for 84% of total emissions.

## Decarbonisation levers<sup>(2)(4)(5)(6)</sup>

Given the strong growth in demand forecasts resulting from rising global GDP, decarbonising the aviation sector is increasingly crucial to achieve climate neutrality by 2050. The industry can:

- Improve energy efficiency by technical measures (including aircraft design and propulsion system) and by operational measures (including load factor and routing optimization);
- Switch to low-carbon fuels (SAF, i.e. biokerosene or e-kerosene);
- Disruptive technology (including electric and hydrogen-powered aircraft);
- Offset residual emissions via Carbon Dioxide Removals (CDR).

In addition, the IEA identifies behavioural changes that reduce overall demand as a key decarbonisation lever. Without behavioural changes, aviation activity in 2030 would be nearly 20% higher.

**Energy efficiency:** average aircraft energy efficiency improvements were 1.5%/y between 2010 and 2019. Measures like operational airline management and fleet renewal could also

contribute to reducing the final energy demand of aviation by up to 48% in 2050<sup>(2)</sup>.

**Low-carbon fuels:** sustainable aviation fuels (SAF) are the only viable reduction lever for long-haul flights. However, most technologies are not mature yet and will not be available at a commercial scale before 2030. Multiple challenges remain such as the lack of bioresources and green H<sub>2</sub> to scale up production, and competition among end users.

Still, ambitious regulations and investment, especially in Europe, support the development of these fuels.

**Disruptive technology:** due to their limited payload capacity in the short-term, hydrogen and battery-electric aircraft will only contribute to carbon emissions reductions for the short-haul segment.

## AVIATION VALUE CHAIN<sup>(7)</sup>



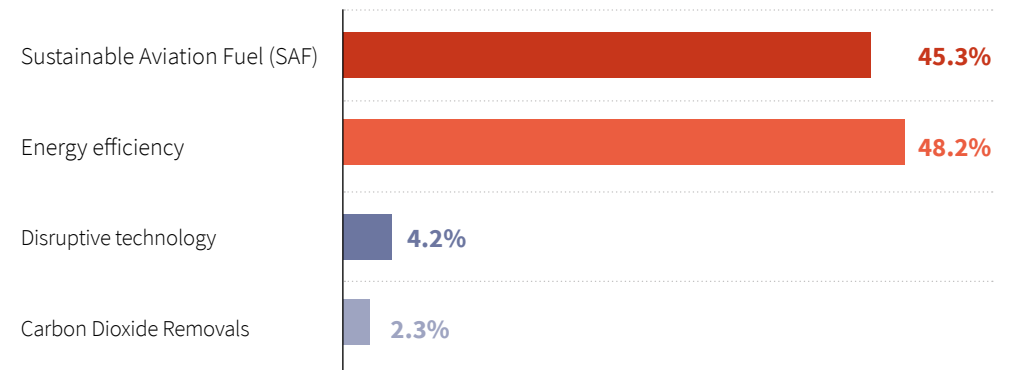
Aircraft production

Airport management

Fuel supply

Aircraft operations

## CONTRIBUTION OF DECARBONISATION LEVERS TO ALIGN WITH A 1.5°C PATHWAY ACCORDING TO MPP PRU'S SCENARIO<sup>(2)</sup>



(1) IEA, *Aviation report*. (2) *Mission Possible Partnership Prudent, Making Net Zero Aviation Possible*. (3) *CarbonBrief, Calculating the true climate impact of aviation emissions*. (4) *Ademe, Scénario de transition du secteur aérien, 2022*. (5) *IATA, Fly Net Zero*. (6) *IEA, Net Zero Roadmap: A Global Pathway to Keep the 1.5°C Goal in Reach*. (7) *Blunomy analysis*.



## 2. ALIGNING AVIATION

As a founder and initial user of the Pegasus Guidelines, Societe Generale actively contributes to the design and implementation of robust methodologies to measure and monitor the alignment of its Aviation portfolio with a 1.5°C roadmap.

### Scope

#### SECTOR BOUNDARY

The boundary relies on the Pegasus Guidelines definition which includes commercial aviation, inclusive of all passenger, belly freight and dedicated cargo traffic.

Clients owning or operating aircraft for commercial purposes are included.

#### EMISSIONS SCOPE

The indicator covers scope 1 and scope 3 category 3 emissions (i.e., well-to-wake emissions, or the “full lifecycle”) for aircraft owners (inclusive of all emissions associated with the production, distribution and combustion of jet fuel). This approach allows for direct life-cycle accounting for SAF and is consistent with current Science Based Targets Initiative (SBTi) and NZBA guidance.

Airport building emissions, aircraft manufacturing emissions, and ground handling emissions are not included.

#### FINANCING ACTIVITIES

All loan-related products are included.

General purpose and dedicated loans are included.

### Methodology

#### CALCULATION METHODOLOGY

**Pegasus Guidelines:** a portfolio level emissions intensity metric for commercial aviation in line with SBTi guidance. The emissions intensity is measured in grams of CO<sub>2</sub>e emitted by each relevant group of aircraft normalized by a traffic metric in the form of revenue tonne kilometers (RTKs). Emissions intensities are adjusted for SAF purchases, then aggregated based on exposure to compute a portfolio level value.

#### SCENARIO

**Mission Possible Partnership Prudent (MPP PRU) Scenario:** a bottom-up 1.5°C aligned roadmap to reach net zero emissions by 2050. The Group selected this reference Scenario because the IEA NZE Scenario does not include disaggregated values for passenger and cargo operations and does not cover the same emission scope (tank-to-wake vs. well-to-wake in the MPP PRU Scenario)

#### METRICS

Emission intensity in grams of CO<sub>2</sub> equivalent per revenue tonne kilometers (gCO<sub>2</sub>e/RTK). The incorporation of RTKs ensures all major payload types are encompassed, including emissions resulting from belly freight and dedicated cargo traffic.

#### KEY ASSUMPTIONS AND LIMITATIONS

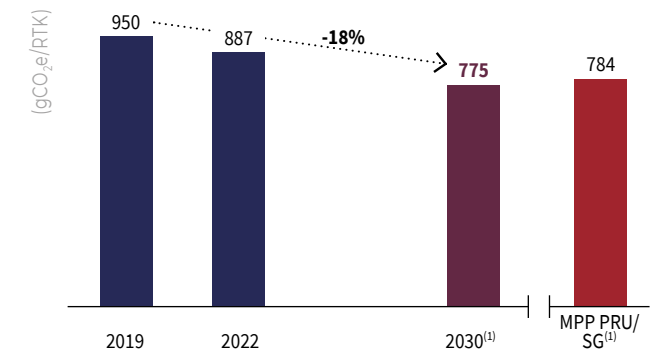
Emission intensities data are provided, for the worldwide aircraft fleet, by third-party, independent external sources, certified under RMI Pegasus Guidelines. The 2030 target is in line with MPP PRU 1.5°C trajectory, based on constant portfolio composition between passenger and cargo aircraft (those categories having different emission intensities profiles).

### Target & Progress

#### BASELINE & TARGET

	2019	2030	% reduction
<i>gCO<sub>2</sub>e/RTK</i>			
<b>Societe Generale Portfolio</b>	950	775	18%

#### PROGRESS



#### DATA PROVIDERS

Where client data is not directly available, Societe Generale will use qualified data providers under the Pegasus Guidelines.

<sup>(1)</sup> 1.5°C Scenario based on Mission Possible Partnership Prudent trajectory (“MPP PRU”) adjusted with SG’s current portfolio composition.



### 3. TAKING ACTION TO SHIFT

#### Clients and assets

- Under the Shift program, bankers from different business lines and geographies have been working together to build expertise on the main transition topics related to the decarbonisation challenges of the sector. It involves all the actors of the value chain: OEMs that design and build aircraft, energy companies to produce and supply sustainable aviation fuels, airport operators that will be essential to reshape and transition the sector, and the airlines themselves.
- The Group has developed a corporate transition assessment tool (TOP) for the Aviation sector, helping bankers have a constructive dialogue with clients around their decarbonisation and transition journey.
- Several teams at Societe Generale follow the development of the Sustainable Aviation Fuels sector (production routes, technology readiness, cost competitiveness, energy suppliers, emerging producers). Being able to outlook market trends, build technical expertise and support the first projects reflect Societe Generale's willingness to position itself in strategic innovative sectors, such as it has on offshore wind and hydrogen.

#### Industry and peers

In April 2024, after in-depth work done during more than 2 years in the Aviation Climate-Aligned Finance Working Group, Societe Generale announced to be a founding member and initial user of the “Pegasus Guidelines”. Designed with the Rocky Mountain Institute (RMI) and leading banks, with an extensive consultation with industry experts, regulators, NGOs, think tanks and overall aviation value-chain (manufacturers, airlines, lessors, airports, investors, etc.), the Pegasus Guidelines are the first climate-aligned finance framework for the aviation sector compatible with the Net-Zero Banking Alliance (NZBA) requirements, and drawn upon existing standards including those of the Science-Based Targets initiative (SBTi). They aim at helping banks independently measure and disclose the emissions intensity and/or climate alignment of their aviation lending portfolios compared to a 1.5°C scenario, thanks to a comprehensive, transparent, and standardized methodology between banks.

By adopting this common methodology, Societe Generale is reaffirming its commitment to support the transition of its clients in the aviation sector and to align its portfolio with 2050 net zero emissions trajectories.

#### Flagship deals

In 2022, Societe Generale acted as sole arranger and sustainability structurer for a EUR 520 million sustainability-linked aircraft-secured term loan

for the financing of ten new Airbus A321neo aircraft. This transaction supports Pegasus Airlines' objective to achieve 'net zero carbon emissions by 2050', by reducing the carbon intensity of its fleet.



In January 2023, Societe Generale signed an Inaugural Sustainability-Linked Bond for Air France-KLM. The KPI is aligned with the EU climate change mitigation objective within the framework of the EU taxonomy.



Societe Generale is advancing the decarbonisation of the cargo transport industry by supporting an innovative and low environmental cargo transportation and infrastructure solution.



**YANN SONNALLIER**

GLOBAL HEAD OF  
AVIATION FINANCE

*“As a founding member and initial user of the Pegasus Guidelines,*

*our ambition is to provide the aviation finance community with a clear, comprehensive and NZBA-compliant methodology to ensure consistency with the Paris Agreement.*

*More globally, we are very much committed to supporting our clients in their ambitious decarbonisation journey, as demonstrated by the innovative Sustainability Linked Loans structured for our clients (like Pegasus Airlines and AF-KLM), which are the first-ever aircraft-secured financings of this kind, or the equity raisings performed to help our clients bring effective decarbonisation solutions to the industry.”*

# 1. SECTOR DYNAMICS

**DECARBONISATION  
LEVERS** (see page 15)



CO<sub>2</sub> emissions from buildings operations reached an all-time high of around 10 GtCO<sub>2</sub> in 2021. Aligning with the 1.5°C Scenario requires deep systemic changes including stronger energy efficiency policies and building codes as well as a scale up of investment in the sector.

## Sector overview

The building sector was responsible for ~37% of CO<sub>2</sub> emissions and 34% of energy demand globally in 2021.

Global floor area in the building sector is expected to increase by 55% between 2022 and 2050 according to IEA's NZE Scenario. 80% of floor area development will take place in emerging economies.<sup>(1)</sup>

The building sector is currently “not on-track” with the NZE Scenario, according to the IEA, as building operational emissions reached an all-time high in 2021, 5% above the 2020 levels and 2% above the 2019 pre-pandemic levels.

In order to be aligned with the NZE Scenario, emissions must fall by 9% per year on average until 2030, more than halving by the end of the decade.

Global annual investment levels needed to reach the 2030 NZE Scenario will require a cumulated investment in energy efficiency of at least USD 3.8 trillion between 2023 to 2030.

## Regulatory landscape

Energy efficiency and clean buildings policies continue to expand globally, but will have to go further to achieve compliance with the IEA NZE Scenario.

The IEA states that “stronger policy support such as minimum performance standards and building energy codes will be required to put the buildings sector on track with the Net Zero Emissions by 2050 Scenario”.

In the EU in particular, the Renovation Wave<sup>(2)</sup> strategy was published in 2020 as part of the European Green Deal. It contains regulatory, financing and enabling measures to double the annual energy renovation rate of buildings by 2030 and to foster deep renovation.

This includes the revision of the Energy Performance of Buildings Directive (EPBD) which was formally adopted by the Parliament on the 12<sup>th</sup> of March 2024. Under the EPBD, Member States are mandated to define energy performance standards and a long-term renovation strategy to support the renovation of residential and non-residential buildings in their country. The EPBD also calls for the gradual introduction of minimum energy performance standards to trigger the renovation of the worst performing buildings.<sup>(3)</sup>

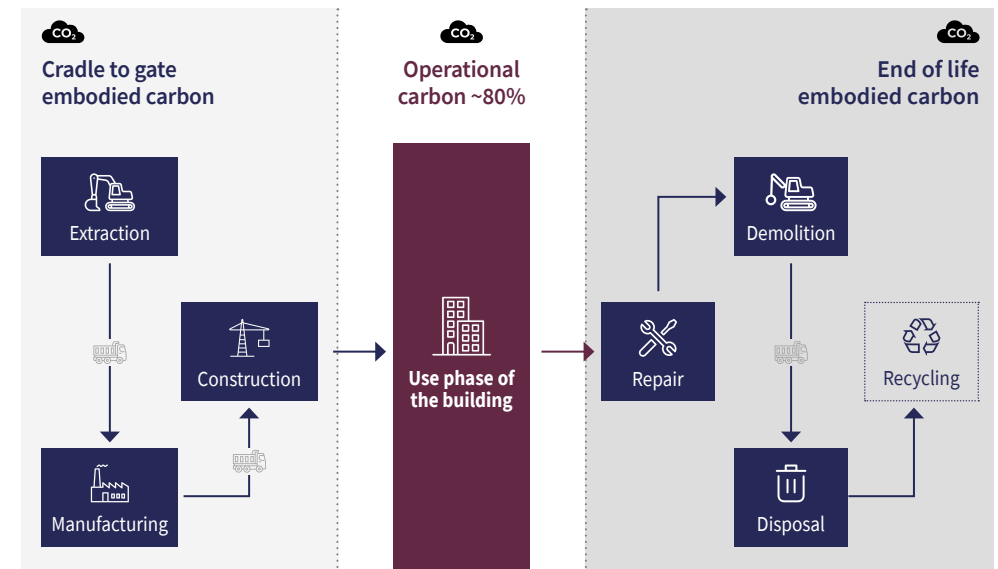
While the EU is at the forefront in terms of ESG regulation, in the US, cities and states are also active. In Asia, we observe national strategies rather than a coordinated regional strategy. Australia is currently working on a local taxonomy.

## Emission sources

Around 80% of the building sector's emissions are operational emissions from energy consumption for space heating, water heating, cooking, cooling, and electric appliances. The remaining are embodied emissions which include upstream emissions linked to building materials and construction.

In the commercial real estate sector, the emission intensity and breakdown is highly dependent on the type of commercial activities undertaken (office, retail, etc.).

## BUILDINGS' LIFE CYCLE EMISSIONS<sup>(4)</sup>



(1) IEA, Buildings. (2) European Commission, Renovation Wave. (3) European Commission, EPBD. (4) Copyright 2021, Carbon Leadership Forum.



# 1. SECTOR DYNAMICS

DECARBONISATION  
LEVERS (see page 15)



This decade is crucial for implementing the measures required to achieve the NZE Scenario. Energy efficiency and the phasing out of fossil fuels will be key decarbonisation drivers.

## Decarbonisation levers<sup>(1)(2)(3)(4)</sup>

Four main challenges lie ahead for decarbonising the commercial real estate sector:

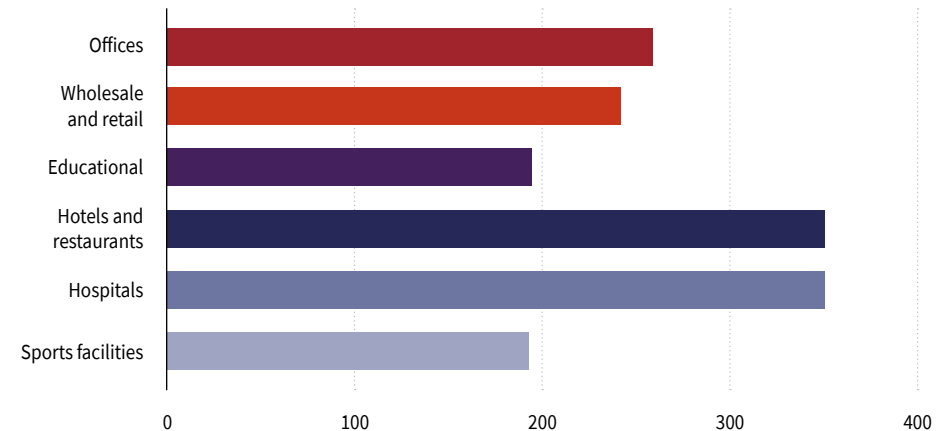
- **Massive deployment of best-in-class building management practices.** Building management practices and technologies such as building automation and smart energy management systems can lead to up to 35% energy savings at a very competitive cost;
- **Increasing the pace of the energy renovation of the existing building stock.** Since today's buildings will represent around 80% of the total building stock in 2050, ramping up the renovation rate will be essential for reaching net zero by 2050;
- **Scaling-up deep renovation.** The IEA estimates that retrofitting 20% of the existing building stock to a zero-carbon-ready level by 2030 through deep renovation will be necessary to reach the NZE Scenario. This means achieving an annual deep renovation rate of 2.5% from now until 2030 and beyond. Currently, the annual renovation rate is 1%, most of which are shallow renovations;

- **Ensuring new buildings are as energy efficient as possible.** New buildings will be operating over the next decades and will not likely undergo significant renovations before 2050. Therefore, they will need to already be aligned with net-zero scenario requirements at construction. Minimum performance standards and building energy codes therefore need to be implemented and strengthened across countries.

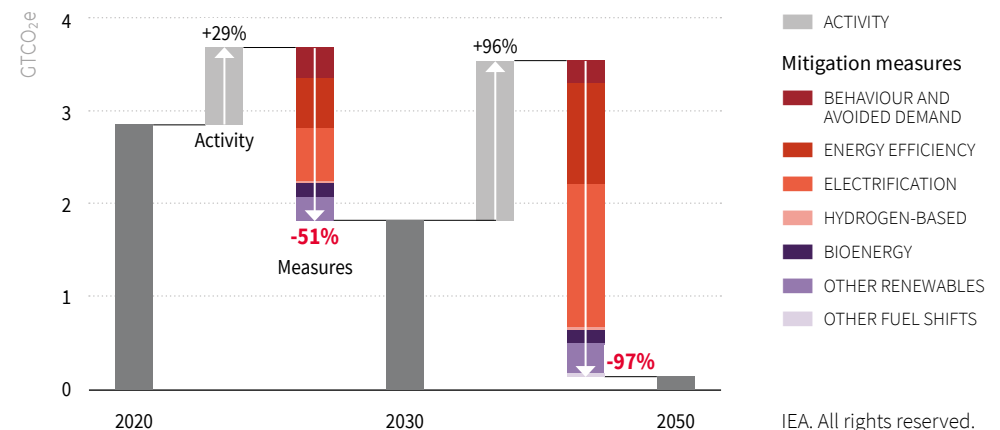
Two main levers are identified in the NZE Scenario to reduce the building sector's operational emissions:

- **Energy efficiency** which includes behavioural changes, improved building insulation, energy-efficient appliances and material-efficient building design, in addition to digitalisation and efficient energy management;
- **Fuel switch** which includes electrification (e.g. through heat pumps) and the switch to renewable sources. In the NZE Scenario, fossil fuels reach 2% of final energy consumption in 2050 while the electricity consumption's share increases from 33% in 2020 to 66%.

## ENERGY INTENSITY OF COMMERCIAL BUILDINGS BY BUILDING TYPE<sup>(5)</sup> (KWH/M<sup>2</sup>/Y)



## DIRECT CO<sub>2</sub> EMISSIONS REDUCTIONS BY MITIGATION MEASURE IN BUILDINGS IN THE IEA NZE SCENARIO<sup>(1)</sup>



(1) IEA, Net Zero by 2050. (2) IEA, Buildings. (3) WBCSD, Net-Zero Buildings.  
(4) IEA, Net Zero Roadmap: A global Pathway to Keep the 1.5°C Goal in Reach.  
(5) UNEP, Global status report for building and construction, 2022.



## 2. ALIGNING COMMERCIAL REAL ESTATE

Societe Generale has set an intensity target for the commercial real estate sector covering building operational emissions and aligned with the CRREM Scenario.

### Scope

#### SECTOR BOUNDARY

Societe Generale's commercial real estate activities encompass many types of financing, asset classes, geographies and clients. However, the initial portfolio alignment scope is limited to the financing of real estate for professional investors as identified by the Q4 2022 ACPR Survey of Real Estate Professionals.

Buildings where the building owner/investor leases, uses, or operates the property to conduct income generating activities are included in the boundary. This includes offices, warehouses, industrial buildings, hotels, retail, healthcare, student accommodations as well as residential multifamily properties.

#### EMISSIONS SCOPE

The scope is limited to the operational phase of the building i.e. scope 1 emissions (e.g., use of natural gas or heating oil for heating purposes) and indirect scope 2 emissions (linked to electricity usage or district heating). Emissions are based on a whole building approach i.e. including tenants consumption. Embodied emissions released during the lifecycle of building materials (including extraction, manufacturing, transport, construction, and disposal) are excluded due to limited data availability.

#### FINANCING ACTIVITIES

All loan-related products are included.

General purpose and dedicated loans are included. Market products, in particular CMBS, are excluded.

### Methodology

#### CALCULATION METHODOLOGY

Portfolio weight approach:

$$\text{Portfolio Emission Intensity} = \frac{\sum_n \text{Emission Intensity}_n \times \text{Financing}_n}{\sum_n \text{Financing}_n}$$

Where *n* stands for credit loan whether secured or unsecured

#### SCENARIO

CRREM v2.02

The Carbon Risk Real Estate Monitor's Second Version provides scenarios by geography and asset type. The Group selected this reference scenario because the IEA NZE Scenario does not provide country or asset type specific pathways. However, the CRREM is consistent with the IEA NZE Scenario.

#### METRICS

Emission intensity metric: kgCO<sub>2</sub>e/m<sup>2</sup>

$$\frac{\text{Scope 1 \& Scope 2 emissions (kgCO}_2\text{e)}}{\text{Surface area (m}^2\text{)}}$$

#### KEY ASSUMPTIONS AND LIMITATIONS

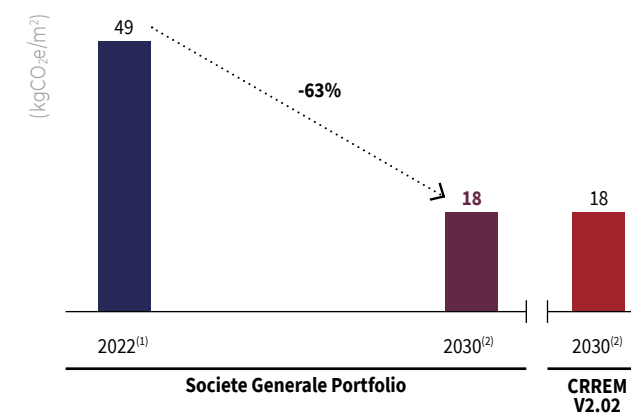
Currently, there is limited data available on the actual energy and emissions performance of clients and assets in Societe Generale's portfolio. Energy Performance Certificates are currently being collected; however, in the meantime, and in the absence of a mature data provider for this sector, proxies from CRREM were used to estimate Societe Generale's baseline. The proxies are based on country and asset type distribution.

### Target & Progress

#### BASELINE & TARGET

kgCO <sub>2</sub> e/m <sup>2</sup> /year	2022 <sup>(1)</sup>	2030 <sup>(2)</sup>	% reduction
Societe Generale Portfolio	49	18	63%

#### PROGRESS



#### DATA PROVIDERS

CRREM: Carbon Risk Real Estate Monitor V2 (2023) intensity emissions

(1) 2022 baseline was estimated based on proxies applied to Societe Generale portfolio distribution by country and asset type. (2) 2030 target is reliant on portfolio mix and shall be adapted accordingly with the corresponding CRREM targets in case of a change of mix. Based on the current portfolio mix (asset type and country), it translates into a target of 18 kgCO<sub>2</sub> e/m<sup>2</sup>. Our ability to reach the target by 2030 will be highly dependent on new rules and incentives from policy makers, as well as more homogenized energy efficiency standards.

### 3. TAKING ACTION TO SHIFT

#### Clients and assets

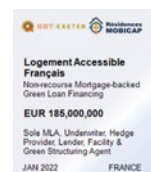
- Societe Generale will further engage in concrete actions with clients to accompany their transition and to steer our portfolio:
  - At client level: assess the transition strategy of clients;
  - At transaction level: improve the collection of performance data for the financed assets and evaluate the decarbonisation plans for under-performing assets;
  - Further develop the offer to finance the decarbonisation of the sector (e.g renovation).
- Under the **Shift initiative**, bankers from different business lines and geographies have been working together to:
  - Build expertise around energy efficiency in buildings and related topics ranging from optimised asset management to building retrofits to be in a position to help real estate clients implement new business models for energy sourcing/ production, energy efficiency and EV charging stations;
  - Understand the challenges faced by the industry in their decarbonisation journey: the ability to collect energy consumption and GHG emissions data at scale, the necessity for tenant engagement, the lack of consistent frameworks among jurisdictions (etc.);
  - Identify concrete levers/solutions to contribute to the decarbonisation of the Commercial Real Estate sector, including through value-added partnerships when relevant.

#### Flagship deals

Societe Generale supports the transition of the real estate sector and the improvement of construction and renovation practices, designing financial support for public institutions and private companies.

In 2022, through an innovative financing project with socially and environmentally positive impacts, Societe Generale acted as sole mandated lead arranger, sole underwriter and green structuring agent for a 7-year EUR 185 million non-recourse mortgage-backed Green financing to accompany

..... EQT Exeter and Mobicap for the development of a portfolio of 50 Mobicap residences specially designed for people with reduced mobility, and with high ESG standards.



In 2023, Societe Generale supported the real estate company **FREY** on its EUR 80 million Sustainability Linked Loan based on three environmental indicators:
 

- Certification of its asset portfolio: attaining the BREEAM<sup>(1)</sup> certification level Very Good for the assets under construction and BREEAM In-Use certification

..... for the assets in operation;
 

- Installation of electric vehicle charging infrastructure to reduce its users' carbon footprint;
- Reduction of its CO<sub>2</sub>e emissions (including all scopes, in validation process by SBTi).



- Leveraging on this expertise, bankers support the commercial real estate transition by offering relevant, innovative solutions based on a comprehensive view of their clients' decarbonisation pathways. Societe Generale structures Green, Social, Sustainability-Linked Loans/Bonds, supported by ambitious transition indicators. We are also planning to structure Transition and Brown-to-Green financings.

#### Industry and peers

- Societe Generale has played a leading role in the NZBA real estate sector.
- The Group is also a member of some sector initiatives such as Observatoire de l'Immobilier Durable, IFPIImm, AFREXIM.

In addition, Societe Generale helps its real estate clients pursue their climate engagements. For example, in 2022, the Group supported **INEA** in its EUR 120 million Sustainability Linked Loan based on two indicators:

- Reduction of its portfolio's energy consumption, to align with the 'Dispositif Eco-énergie tertiaire' 2030 objectives;
- Reduction of the non-recycled waste share in its assets under exploitation.



**JÉRÔME GATIPON BACHETTE**  
GLOBAL HEAD  
OF REAL ESTATE  
STRUCTURED FINANCE

*"While a quarter of the building sector's emissions stems from Commercial Real Estate, our priority within Societe Generale is to pro-actively engage our clients in their transition and decarbonisation strategies by 2030 while addressing their needs through tailored financing and adapted sustainable solutions to preserve the financed assets' cashflow and value. In a fast-evolving Real Estate market, the collective involvement and commitment of all real estate players, including lenders, will be essential to further support the Net- Zero transition of the sector"*

..... In 2022, the Group acted as Mandated Lead Arranger, underwriter and Senior Lender and Green Advisor on a EUR 69.5 million non-recourse mortgage-backed Green financing provided to **Investcorp** to acquire a LEED platinum<sup>(2)</sup> building to accommodate the International Fund for Agricultural Development.



(1) BREEAM In-use certification is a performance standard assessing the asset and management performance of a building.

(2) LEED certification provides a framework for healthy, highly efficient and cost-saving green buildings based on social, environmental and governance indicators.

# 1. SECTOR DYNAMICS

DECARBONISATION  
LEVERS (see page 15)



Operational emissions in the building sector accounted for **26% of global emissions in 2022** according to the IEA. The Net Zero Scenario considers that the building sector floor area will increase by around 20% from 2021 to 2030. More than 80% of floor area development will take place in emerging and developing economies.

## Sector overview

**The sector is not on track with the IEA NZE Scenario** and the gap between the actual climate performance of the sector and the decarbonisation pathway is widening (from 6.6 points in 2019 to 9.0 points in 2021).

In the NZE pathway, the residential building sector does not fully reach Zero-emissions by 2050. Residual emissions may remain and will be balanced by carbon sinks and other offsetting measures.

The key 2030 milestones are:

- To decrease by 25% the energy consumption in buildings compared with 2021, and by 40% the use of fossil fuel;
- To have all new buildings and 20% of the existing building stock zero-carbon-ready.

## Regulatory landscape

To boost the energy performance of buildings, the EU has established a legislative framework that includes the **Energy Performance of Buildings Directive** and the **Energy Efficiency Directive**, both revised in 2023.

The directives promote policies that will help:

- Achieve a highly energy efficient and decarbonised building stock by 2050;
- Create a stable environment for investment decision;
- Enable consumers and businesses to make more informed choices to save energy and money.

In France, many incentives and regulations have also been adopted such as:

- The RE2020 regulation imposing strict environmental limits for the performance of new buildings;
- Incentives (tax credit, interest-free loans, subsidies) for homeowners undertaking energy-efficient renovations;
- The ban on buy-to-let properties with a low energy efficiency.

## Emission sources

Around 80% of the building sector's emissions are operational emissions coming from the building use phase. These emissions are split between direct emissions (scope 1, from on-site fossil fuel combustion) and indirect emissions (scope 2, purchased energy), accounting respectively for about 30% and 70% of total operational emissions.

Remaining emissions are embodied emissions (scope 3) which refer to emissions generated to produce, maintain and dispose of a building. These emissions are currently estimated at an average share of 20-25% of a building's life cycle emissions but can represent up to 50% for high efficiency buildings.

## Decarbonisation levers

Two main levers are identified in the NZE Scenario to reduce the building sector's operational emissions:

- **Energy efficiency** which includes behavioural changes, improved building insulation, energy-efficient appliances and material-efficient building design, in addition to digitalisation and efficient energy management;
- **Fuel switch** which includes electrification (e.g. through heat pumps) and the switch to renewable sources. To get on track with the NZE Scenario, the global heat pump stock would need to cover at least 20% of global heating needs vs. 10% in 2022.

Other levers include:

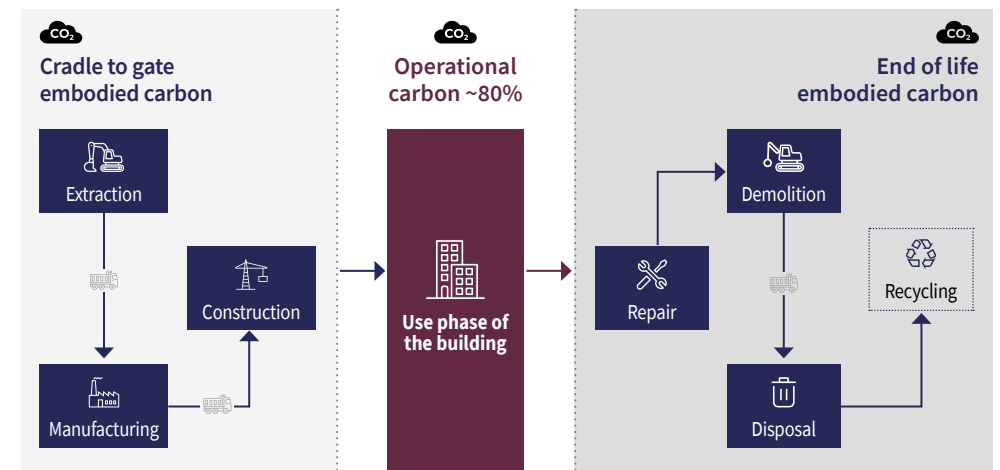
- The development of **onsite renewables-based energy system** (solar water heaters, photovoltaic panels...);

- **Bio design and cooling consumptions of dwellings** via the installation of large bay windows to the south and construction of roof overhangs.

The decarbonisation of the real estate sector faces strong challenges, among which:

- the **financial resource capacity** of residential owners and the existence of split incentives between owners and tenants;
- the **poor quality of** access, consistency, and robustness of **data** on energy performance and carbon intensity of buildings;
- the potential **limited capacity in the construction industry** to face a major wave of buildings retrofit.

## BUILDINGS' LIFE CYCLE EMISSIONS (Blunomy Analysis)







## 2. ALIGNING RESIDENTIAL REAL ESTATE

While displaying its baseline for Residential Real Estate, Societe Generale has not yet set a public target for 2030 due to data availability and high dependency on public policies. Besides, setting exclusion criteria for residential owners could dramatically impact financial inclusion of millions of households. Nevertheless, Societe Generale is strongly committed to contributing to the decarbonisation of the sector by monitoring the carbon intensity of its portfolio, developing innovative financing solutions and promoting energy renovation.

### Scope

#### SECTOR BOUNDARY

The baseline calculation covers:

- **Building types:** Single family and multi-family buildings;
- **Financial scope:** Housing Loans;
- **Geographical scope:** France (excluding the Private banking division due to data availability). The scope will be progressively extended to the other geographies.

#### EMISSIONS SCOPE

The indicator covers scope 1 and 2 emissions of buildings. These emissions are generated during the operational phase of the building, e.g., use of fuels for heating purposes, electricity, or district heating.

The metric excludes embodied emissions associated with materials and construction processes due to limited data availability.

#### FINANCING ACTIVITIES

Perimeter of activity is linked to "Pillar 3; template 2: Banking book – Climate change transition risk": loan collateralized by immovable residential property or guaranteed by Credit Logement.

### Methodology

#### CALCULATION METHODOLOGY

Portfolio weight approach:

$$\text{Portfolio Emission Intensity} = \frac{\sum_n \text{Emission Intensity}_n \times \text{Financing}_n}{\sum_n \text{Financing}_n}$$

*Where n stands for credit loan whether secured or unsecured*

#### METRICS

Emission intensity metric: kgCO<sub>2</sub>e/m<sup>2</sup>

$$\frac{\text{Scope 1 \& Scope 2 emissions (kgCO}_2\text{e)}}{\text{Surface area (m}^2\text{)}}$$

#### KEY ASSUMPTIONS AND LIMITATIONS

Energy Performance Certificates (EPC) are currently being collected for housing loans in Societe Generale portfolio. For this initial exercise, the baseline was calculated by matching the addresses of Societe Generale housing loans with the French national Energy Performance Certificate database. About 56% of total in-scope exposure were matched with the database; the rest was estimated based on proxies. As such, the accuracy of the baseline is, at this stage, limited. The baseline will be restated, if necessary, in the future once more accurate data is available.

The calculation does not take into account the surface area of the assets. Methodological evolutions are currently being considered.

### Target & Progress

#### BASELINE & TARGET

kgCO <sub>2</sub> e/m <sup>2</sup> /year	2022	2030	% reduction
Societe Generale Portfolio (France only)	27	No target set to date	N/A

#### DATA PROVIDERS

ADEME Energy Performance Certificate database

CRREM: Carbon Risk Real Estate Monitor V2 (2023) intensity emissions



### 3. TAKING ACTION TO SHIFT

#### Clients and assets

- The Residential Real Estate sector has specific features as (i) it involves households rather than companies, (ii) the sector is highly dependent on public policies and (iii) the loan maturities are longer which implies more inertia of the portfolio.
- In France, where most of Societe Generale portfolio is located, energy renovation faces multiples challenges despite significant regulation and subsidies deployed by the government in the past two decades. According to a recent study published by the Institut de *la Finance Durable*<sup>(1)</sup>, the main challenges include (i) the complex administrative and technical journey for households, (ii) the difficulty related to project definition and selection of professionals and (iii) the uncertainty regarding the economic profitability of investment projects.



**PHILIPPE AYMERICH**  
DEPUTY CHIEF EXECUTIVE OFFICER

*"We are deeply committed to support our clients in the multiple challenges they face in their energy renovation. Our ambition is to grant them accurate advisory support and customized financing solutions. In addition, we look for relevant partnerships to introduce them the best-in-class actors in the sector."*

(1) *Plan d'actions pour le financement de la transition écologique, Institut de la Finance Durable.*

#### Flagship initiatives

Despite these challenging factors outside of the bank's control, the Group has decided to develop an ambitious strategy to support the transition of the sector, based on the following main pillars:

- developing innovative financing solutions incentivizing energy renovation (e.g., Boursobank's eco-responsible loan);
- establishing partnerships with key players to foster energy renovation by providing integrated service offerings to homeowners (e.g., Hello Watt partnership);
- working with public bodies to identify required changes in the regulatory and policy landscape to support the transition of the sector.

Banks are in a pivotal position to provide innovative financing solutions and to help remove barriers to energy renovation. The Group will continue to contribute to the decarbonation of its portfolio. Progress will be monitored regularly and shared with management body.

#### In France, Societe Generale Retail France (SG) is key partner in the creation of an Energy Renovation Bank

In response to the ADEME request for proposals, the consortium in which SG is a founding partner, ORENO ("Opérateurs Ensembliers de la Rénovation"), was selected. This consortium is composed of partners from different sectors (insurance, energy efficiency advisors, other banks...) sharing common goals:

1. to create a new operator dedicated to energy efficient renovations, and
2. to create a platform to facilitate the associated financing.

A new bank, **Fideo-Banque de la Rénovation Energétique**, will be created to offer inclusive solutions, to finance energy efficient renovations at scale, and to facilitate and secure the loan granting process.

#### In France, SG joined forces with Hello Watt, to ease the energy renovation of housing in France.

The partnership aims to design supporting measures to help private owners carry out energy assessments of their homes, access financing, and connect with a network of certified artisans.



#### SG brings advisory support to private customers as well as targeted financing solutions to finance energy renovation in the residential sector with preferential interest rate.

Boursobank offers preferential interest rates for the financing of energy renovation works or high energy performance buildings.

Since 2018, Boursobank has been offering an eco-responsible personal loan at preferential rate to finance energy renovation works.

From 2023, Boursobank reinforced its strategy by providing a discounted interest rate to private owners acquiring a property with a high level of energy performance.

This initiative facilitates access to energy-efficient housing as homeowners save money both on their loan interest rate and on their energy bill.



# 1. SECTOR DYNAMICS

DECARBONISATION  
LEVERS (see page 15)



Population growth puts food security at risk, and climate change poses new challenges for the agricultural sector. Accounting for 22%<sup>(1)</sup> of global GHG emissions in 2020 according to the FAO<sup>(2)</sup>, the sector is expected to find decarbonisation pathways to create a sustainable food future and preserve nature capital.

## Sector overview

The world's population is set to increase over the course of the 21<sup>st</sup> century, reaching over 9 billion by 2050<sup>(3)</sup>. To meet food demand, livestock production is expected to increase by 35% between 2020 and 2050, and the area harvested for crop production by 10% between 2020 and 2050. With 27% of global jobs relying on agriculture, designing a sustainable model is critical to ensuring a fair transition<sup>(4)</sup>.

## Emission sources

In 2020, global agriculture and related land use emissions accounted for 10.4 GtCO<sub>2</sub>e, i.e. 22% of global GHG emissions including land use change and forestry<sup>(5)</sup>. Most of the sector's emissions (2/3<sup>rd</sup>) occur upstream and are commonly referred to as "FLAG" (Forestry, Land and Agriculture) emissions. Those emissions come from three main sources:

- **Livestock** (40% of FLAG emissions), mostly linked to meat (67%) and dairy (30%) production;
- **Deforestation and land conversion** (39% of FLAG emissions), caused by specific commodities (incl. cattle, palm oil and soy) in particular geographies (incl. South America, Indonesia, Malaysia, Western Africa);
- **Farming practices** (21% of FLAG emissions).

According to the World Resource Institute, global emissions linked to agriculture could reach 15 GtCO<sub>2</sub>e in 2050, increasing by 43% compared to 2020<sup>(6)</sup>.

Beyond carbon emissions, agriculture has various impacts on biodiversity, soil & water pollution and water availability. At the same time, our food system is totally based on these natural elements that climate change is jeopardising. Continuing to produce high-quality nutrients within the planetary boundaries will be the sector's main challenge in the coming decades<sup>(7)(8)</sup>.

## Decarbonisation levers<sup>(5)</sup>

The agriculture sector is made of multiple sub-sectors, each with its own specificities, geographical issues and mitigation levers. The SBTi FLAG pathway categorizes mitigation levers into seven priority areas:

- Reduce land-use change;
- Improve agriculture;
- Shift diets;
- Reduce food loss and waste;
- Restore forests;
- Improve sustainable forest management (SFM) and agroforestry;
- Enhance agriculture soil carbon.

These categories represent a viable mitigation target (sum of emission reductions and removals) for the land sector of approximately 12 GtCO<sub>2</sub>e/yr in 2050. For livestock, specifically (dairy and meat production), mitigation measures include:

- 1. Reducing methane emissions from enteric fermentation and improving productivity** (improving feed and nutrition, animal healthcare, animal genetic resources and breeding...).

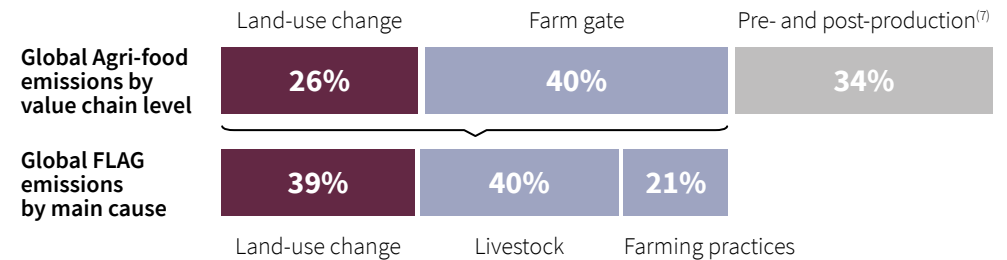
- 2. Restoring the quality of pastures and increasing soil carbon**, by improving grazing mobility and pasture species, and by growing trees on pastureland (silvopastoralism).

- 3. Leveraging circular economy and bioenergy** (recycling organic waste into

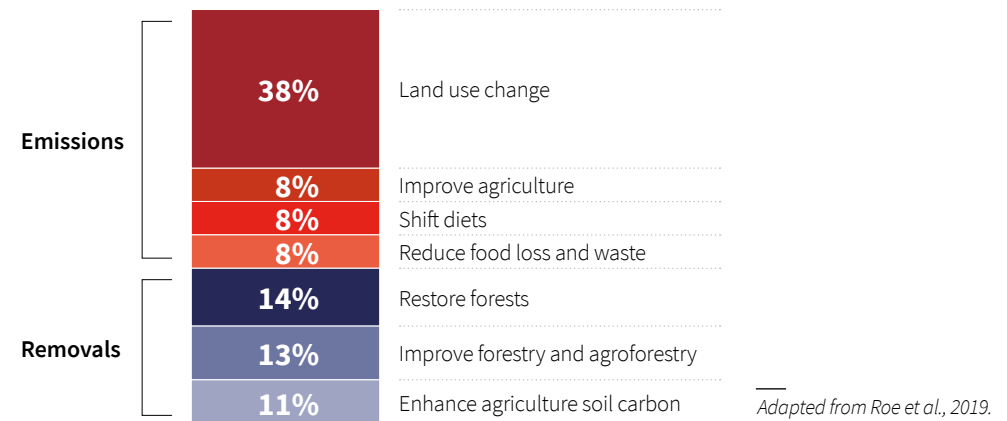
feed ration or bioenergy, using manure to replace chemical fertilizers...).

- 4. Managing on-farm energy use and sourcing renewable energy** (e.g., solar photovoltaic).

- 5. Diversifying to alternative proteins** (e.g., plant-based dairy products or meat).



## LAND-BASED MITIGATION OPPORTUNITIES (12 GtCO<sub>2</sub>e/YR IN 2050)<sup>(5)</sup>



(1) This figure encompasses the emissions from within the farm gate and from associated land use and land change activities. (2) FAOSTAT Emission Database. (3) United Nations, World Population Prospects, 2022. (4) World Bank Data. (5) Forest, Land and Agriculture (FLAG) Science-based target-setting guidance. (6) World Resources Institute, Creating a sustainable food future, 2019. (7) IPCC, Climate Change and Land, 2020. (8) FAO, Challenges and opportunities for agrifood systems, 2022.

## 2. ALIGNING AGRICULTURE

Because of the sector's fragmentation, the lack of robust granular data and mature methodologies for the banking sector, Societe Generale decided to strengthen its action on the sector without setting a public emissions-based target at this stage.

### Societe Generale's portfolio

To address the sector's alignment, Societe Generale started by analyzing its portfolio and by identifying key value chain segments and commodities.

Two main components of Societe Generale portfolio stand out for the agri-food sector in the short term:

- **Livestock:** the dairy commodity appears as the most material commodity in Societe Generale's portfolio;
- **Deforestation and land-conversion:** Societe Generale works with clients exposed to commodities linked to deforestation and land-conversion (incl. soy, beef, palm oil, coffee, cocoa, rubber, timber).

### Barriers to aligning agriculture

Societe Generale has not set a public emissions-based target for this sector to date. This is due to several factors:

- **Companies in the agri-food sector are diversified** (around various commodities) and generally manufacture or sell a multitude of products;
- **Each commodity has its own challenges,** levers and the relevant strategies are very local-specific;
- **Methodologies and scenarios are still nascent.** Agriculture is not covered by the IEA NZE Scenario. SBTi has recently published its FLAG guidance introducing a common framework and 1.5°C emission reduction pathways.

However, this methodology is designed for the industry and is not easily applicable for financial institutions. Also, scenarios do not allow yet to take into account important decarbonization levers such as the diversification of players towards plant-based alternatives for dairy and meat activities;

- **Data availability is still limited** (there is no external data provider and few clients disclose emissions and activity data, let alone by commodity).

### Societe Generale's action

Despite these challenges outside of the bank's control, the Group decided to strengthen its action where its portfolio's impact is most material and to support the transition of the sector around the following main pillars:

- **Monitor client progress and carry out client engagement initiatives;**
- **Monitor the reduction of the carbon intensity of the dairy value chain** with regular reporting of progress to the management;
- **Strengthen the Group's agriculture policy on deforestation and conversion,** which will be updated in 2024 (see box below);
- **Keep on monitoring data availability and industry best practices** regarding the setting of emission-based targets.

### Industrial agriculture and forestry sector policy

The Group is willing to remain a value-adding partner to its clients operating in these sectors, while ensuring that such support is provided in a responsible and considered manner.

Curbing deforestation and land conversion associated to soft commodities is one of the key objectives of the policy:

- Corporate clients active in **palm oil and South American soy and cattle sectors** - as producers, traders or first transformers - are required to be i) committed to deforestation- and conversion-free activities, ii) committed to establish and systematize traceability throughout their supply chain and iii) able to report progress annually on traceability.

In a continuous improvement process, the policy will be updated by the end of 2024, with the aim to:

- **Set more stringent criteria on clients active on the above-mentioned commodities;**
- **Extend the scope of commodities requiring attention as regards deforestation with new evaluation criteria on clients active in cocoa, coffee, rubber and timber.**





### 3. TAKING ACTION TO SHIFT

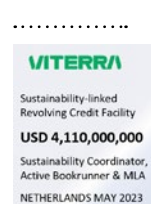
#### Clients and assets

- In 2022, the Group published a new agriculture and forestry sector policy, which reinforced its commitment on deforestation and conversion on certain sensitive commodities (palm oil and South American soy and cattle sectors) and engaged with its clients active in these sectors. In April 2024, the Group included additional criteria on human rights.
- Under the Shift program, bankers from different business lines and geographies have been working together to:
  - Identify the emerging leaders of tomorrow that are developing (i) alternatives to highly emissive food products (plant-based products, insect proteins...) or (ii) new technologies or processes aiming to reduce emissions (carbon footprint tracking tools, emission reduction modeling...);
  - Promote our new Nature-Based Capital solutions towards corporates in the food & agri value chains in support of their effort to reduce their scope 3 emissions and foster the adoption of sustainable agriculture practices within their supply chains.
- Leveraging on the expertise built, bankers maintain a close dialogue with clients on their ESG strategy, to understand their needs and challenges and accompany them in their transition.
- In order to deepen and structure these strategic discussions with clients on transition topics, the Group plans to roll out a corporate transition assessment tool (TOP). This tool will also help the Group assess the ambition, credibility and performance of clients' climate transition strategy and benchmark them with peers.

#### Flagship deals

Societe Generale participates in the development of a sustainable agriculture system, supporting its clients in their carbon reduction pathways.

For instance, in 2023, the Group acted as sole Sustainable Coordinator, Active Bookrunner and MLA for the USD 4.1 billion sustainability-linked revolving credit



facility for the global food product supplier – Viterra. The facility is linked to Viterra's sustainability targets, which include a reduction of GHG emissions and energy use, increased traceable-to-origin soy sourced in South America and achieving safety targets.

In Cameroon, the Group acts as fund manager for the FCFA 3.75 billion financing of the **Programme de promotion de l'entrepreneuriat jeune** to support the development of professional activities for young men and women in the agropastoral industry. This initiative aims to support



the development of a performant agriculture, fight against rural poverty and improve food security. Between 2019 and 2021, this programme helped create 2,000 agropastoral companies and 8,000 direct jobs.

#### Industry and peers

Since January 2024, Societe Generale has become a member of the international consortium 4p1000, an international initiative aimed at promoting soil health and agroecological practices. Launched by France during Cop 21 (2015), 4p1000 has more than 800 members including governments, universities, research institutes, but also corporates in the food & ag universe, start-ups, banks.

Societe Generale has also engaged in external partnerships with the aim of promoting agroecological transition at scale (InVivo) or helping cooperatives and their members shift towards sustainable agriculture in Africa (KSAPA/SUTTI program).



**VINCENT NOBILET**  
MANAGING DIRECTOR,  
AGRIBUSINESS, TRADE  
& SUSTAINABLE  
COMMODITY FINANCE

*“By selecting Regrow as part of our Global*

*Markets Incubator program, Societe Generale is taking concrete actions to support the development of regenerative agriculture in the world. In partnership with this young, fast-growing start-up, we promote technical solutions to measure and monitor the deployment of agriculture practices that are more respectful of the environment, help decarbonize the atmosphere, and eventually provide more resilient revenues to farmers.”*

Societe Generale commitment integrates the biodiversity at the heart of its action. Via its investment in **EcoTree**,

the Group promotes a sustainable forest management approach. This investment accelerates the development of innovative offers for biodiversity, carbon offset solution and tree planting solutions.



In 2023, we have chosen to accompany the start-up Regrow within our Global Market Incubator. **Regrow** accurately measures soil carbon sequestration and emission reductions through the implementation of regenerative agriculture, with a software that enables.



(1) <https://www.Societegenerale.com/sites/default/files/documents/CSR/Industrial-agriculture-and-forestry-sector-policy.pdf>

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Indicators presented in the document are calculated based on multiple internal and external data and information that are subject to measurement uncertainties. As of today, climate-related data is neither exhaustive

nor broadly available while also subject to inconsistencies as it does not follow global standards. Yet, as clients increasingly adopt climate disclosure framework and reporting, the Group expects the accessibility and reliability of external data on emissions

will improve over time. The indicators communicated in this document are subject to data uncertainties. Limitations in data collection, verification, and reporting as

well as lack of reliable and standardised measurement techniques across the industry impede data consistency. Although improving, this situation represents a key concern for stakeholders engaged in more transparency.

Existing calculation methodology presents significant challenges in terms of consistency, adoptability by industry players, and replicability across sectors. In an effort to tend towards a more market-accepted and consistent way of measuring and reporting emissions, regulatory guidance and requirements have evolved in recent years.

These guidance and requirements are still under development and are expected to stabilise over time. As methodologies evolve and data improve, the Group will continue to review the impact on reported baseline which may lead to refining of calculations over time. Any opinions and estimates should thus be regarded as indicative and preliminary.

The definitions and technical terms used and not defined herein have the meanings assigned to them in the universal registration document of Societe Generale.

