



Business and carbon neutrality: a collective transformation

November 2022

CHAIRMAN'S MESSAGE



In the seven years since the Paris Agreement, many economic stakeholders in France, Europe and beyond have made the shift to decarbonisation. The recent IPCC report, especially section three on solutions, describes what some businesses are already doing and what many examples in this brochure illustrate. The inescapable nature of the transformation is increasingly acknowledged and accepted by shareholders, financiers and managers as well as by stakeholders and, more and more, by customers. It is therefore better to anticipate the structural transformations and be among the first to turn them into an opportunity. This process has begun.

However, businesses still face many uncertainties about what pace to adopt in each region of the world, how to connect individual and collective solutions, what the most relevant technologies are and at what speed the transition expected by stakeholders, shareholders, customers, employees, partners and public opinion alike should occur.

This transformation calls into question some activities, while benefiting others. Even in a growth economy, the ZEN 2050 study as well as ADEME's recent scenarios suggest the downsizing of some activities and their substitution by other, less carbon-intensive, products and services. This process is common in the world of business, but it has to be more comprehensive and demanding for decarbonisation, especially as 2050 is not far away. It also has to be managed by integrating, as of now, natural resource and biodiversity concerns with efforts to achieve health and social justice ambitions, which in turn raise critical challenges.

The transition thus impacts all corporate functions, and transforms their very ecosystem, including the economic models and technologies used, suppliers, geographical locations, product offerings and their promotion among business customers and consumers. It forces us to anticipate and factor in new public-policy frameworks which ensure that we all move in the same direction sufficiently fast.

Decision-making in the face of uncertainty is inherent in economic activity. ZEN 2050 showed the desirability and importance of making decisions together in a collective effort that necessarily involves citizens, public authorities and the business world. This publication aims to share the experience of EpE members who are moving in that direction. We hope it will be useful to many others.

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Chairman of Entreprises pour l'Environnement (EpE)

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INTRODUCTION

A major transformation of our economic and societal model

In the space of a few years, carbon neutrality has emerged as the key issue to address in controlling ongoing climate change and protecting human societies from its effects. Institutionalised by its inclusion in the Paris Agreement, it has been taken up by many countries, organisations and businesses. The transition to carbon neutrality for businesses involves major questions and transformations.

In April 2014, based on reports by the Intergovernmental Panel on Climate Change (IPCC), the Secretary-General of the United Nations Framework Convention on Climate Change (UNFCCC) called on countries to raise their collective ambition, and identified global carbon neutrality in the second half of the century as a necessary condition for limiting the harmful effects of climate change on humanity. A year and a half later, the Paris Agreement endorsed in article 4-1 the aim of the parties "to achieve a balance between anthropogenic emissions by sources and absorption by sinks of greenhouse gases in the second half of this century, on the basis of equity, and in the context of sustainable development and efforts to eradicate poverty".

This goal has since become a benchmark. By early 2022, there were 136 countries, 234 cities¹⁾, and 2,643 companies²⁾ that had already committed themselves to carbon neutrality. The European Climate Law adopted in June 2021 incorporated into legislation the European Union's objective of climate neutrality by 2050. The Green Deal Pact translates this goal into various EU laws.

The French Climate Action Plan submitted in July 2017 by the Minister for Ecological Transition and Solidarity, Nicolas Hulot, confirmed France's commitment to carbon neutrality by 2050. This goal was reiterated in 2018 in the second National Low-Carbon Strategy study (SNBC).

The ZEN 2050³⁾ study, published in May 2019 and conducted by 27 EpE member companies in conjunction with a consortium of experts, explored the conditions for achieving carbon neutrality targets across France and the territorial implications of that approach. It produced three answers: carbon neutrality nationwide is possible economically, technologically and socially.

With an annual emissions reduction rate of 4.5%, this unprecedented transformation stresses the need to leverage every solution and player, including the different levels of government as well as all economic stakeholders and citizen-consumers.

This transformation, dictated by the physical limit of our planet's ability to absorb anthropogenic greenhouse gas (GHG) emissions, covers all aspects of society:

- **The impacts of global warming**, estimated at +1.1°C (or even +1.4°C or more in France), are already obvious. Recent IPCC reports point out that the frequency and magnitude of extreme weather events will continue to increase, with some changes now being irreversible. This climate crisis is compounded by biodiversity loss and its consequences. We only have time for one ecological transition by 2050, and this must achieve far-reaching transformations designed to address a multiplicity of issues.
- **Politically**, there appears to be a broad consensus on the goal of long-term carbon neutrality, with strategies being defined at national, regional and local level. However, we still lack the short-term legal and regulatory mechanisms needed to put us firmly on the appropriate pathway. However, in the face of the growing emergency, procrastination could come at the cost of predictability and progress, while resulting in geographical heterogeneity.
- **Economic** globalisation - despite its role in spreading low-carbon innovations, particularly to developing countries where low-carbon infrastructure is sorely needed - is facing critical challenges. The invasion of Ukraine in early 2022 is a harsh reminder of our dependence on fossil and related energy resources and of food sovereignty issues. The slow adoption of ambitious environmental policies at national level is regularly blamed on international trade rules.

1 <https://zerotracker.net>

2 <https://sciencebasedtargets.org/companies-taking-action>

3 ZEN: net zero emissions: <http://www.epe-asso.org/zen-2050-imaginer-et-construire-une-France-neutre-en-carbone-mai-2019>

- The widespread deployment of **technologies** is both a major economic opportunity and a challenge in terms of investment and skills. According to the International Energy Agency, 34% of emission reductions required by 2050 will come from solutions yet to be commercialised^[4]. But all too often, they mask the necessary changes to be made in our lifestyles, as the IPCC has for the first time underlined in section three of the Sixth Assessment Report, published in early April 2022.
- **Socially**, the many co-benefits of a successful transition are synonymous with a great improvement in quality of life. In the short term, however, economic transformation raises issues of cost and investment, jobs and skills transition, and adjustments in our lifestyles and consumption patterns. Social expectations about the fairness of the transition, its attractiveness, and the credibility of commitments and policies are increasingly being voiced, especially as the most socially vulnerable are also the most affected and the least able to adapt. The transition cannot be dealt with separately from inequality issues, which raises democratic questions of acceptability, desirability and feasibility, and even suggests the establishment of a new social contract.

Against this backdrop of increasing complexity and expectations, EpE member companies met within the Climate Change Commission to discuss the individual decarbonisation strategies they have implemented across their organisations in the last few years. This publication sets out the questions raised and describes the solutions those companies have been striving to develop over time. In achieving collective transformation, each company uses multiple levers that differ in their impact or ease of implementation. We thus address the issues from a corporate perspective: how can each corporate player act on their

own? Do they go it alone, and if they do not, with whom do they team up and how? What difficulties are to be overcome and how? How does one conduct the organisation's internal transformation while playing an active role in the transformation of one's ecosystem?

The aim is to show the difficulties encountered, to offer possible solutions, and to provide feedback on the implementation of corporate climate strategies. This paper is neither a methodology for, nor a monograph on, carbon neutrality. It is by no means exhaustive and focuses on action. The abundance of best practices gathered here illustrates the depth as well as diversity of the actions already carried out. The purpose is to strengthen ambition by showing what can be achieved.

This booklet is designed both for companies that want to initiate and accelerate their move towards carbon neutrality, and for their various stakeholders who are aware of the systemic aspects and difficulties of that transition.

Chapter 1 addresses the issues of strategy definition, while of course taking into account the environmental and scientific integrity of the strategy as well as broader considerations than the climate.

Chapter 2 deals with the internal transformation of companies once their strategy has been defined. Such corporate transformation is key, as it encompasses corporate purpose, governance, operations, and management processes. Indeed, the entire organisation undergoes transformation.

Chapter 3 explores the collective dimension, beyond the areas over which the company exercises direct control: transformation of supply chains, markets, and territories, i.e. fields where the influence of companies is indirect and at times limited, but where their action is indispensable.

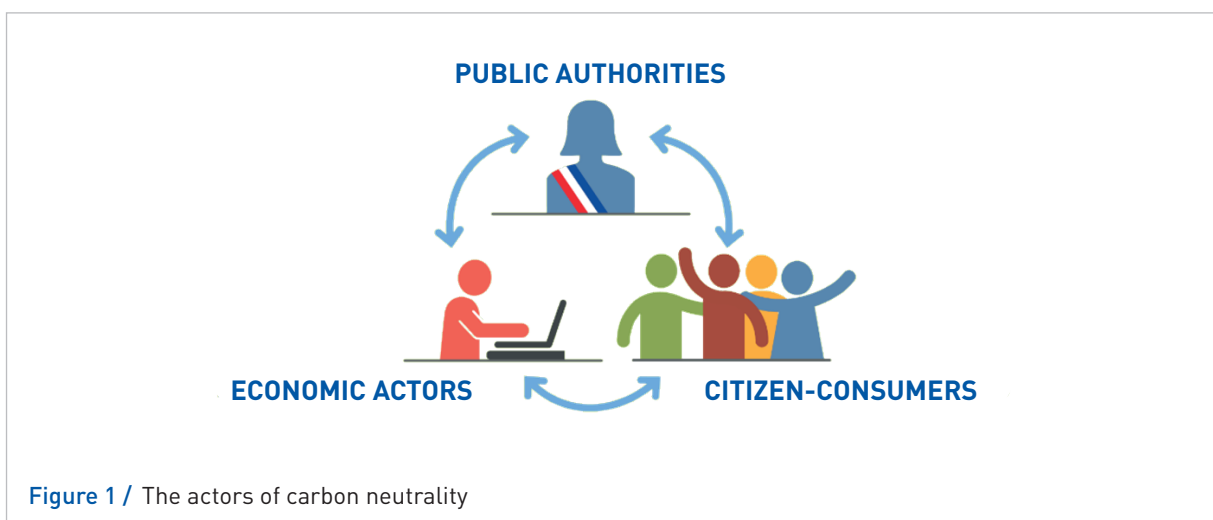


Figure 1 / The actors of carbon neutrality

4 <https://www.iea.org/reports/clean-energy-innovation>

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1

Defining strategy: think climate and beyond

Chapter 1 places the concept of carbon neutrality in the context of corporate strategy development. It describes the respective effects and goals of carbon reduction and sequestration, as well as those of climate strategy from the point of view of ecological transition.

The last three sub-chapters deal with ‘beyond climate’ issues that drive business strategies to achieve carbon neutrality.

A Escalating ambition by reducing emissions first

1. The difficulty of applying carbon neutrality to businesses

The concept of carbon neutrality is a product of climate science and has gradually become a global, collective goal in line with its scientific definition. The adoption of this goal by many stakeholders is an encouraging fact, demonstrating a readiness to adopt international science-based frameworks.

Businesses refer to these frameworks to establish the credibility of their climate strategy for the benefit of their stakeholders, including shareholders, public authorities, civil society and employees. Consistency with the Paris Agreement has thus become a key criterion. The implementation of carbon neutrality by businesses is, however, subject to interpretation. The definition of carbon neutrality is based on the quantification of a company’s carbon allowance (total quantity that can be absorbed and thus emitted), which takes into account its size and sector. Since the question of how this allowance is defined has never been the subject of consensus in intergovernmental negotiations (COP Climate), a host of initiatives, commitments and statements exist on the issue.

The multiplicity of metrics has raised questions about overall ambition, methodological transparency and reporting value. In addition, there are frequent controversies and criticisms of corporate references to carbon neutrality. In France, for example, lawmakers now regulate references to this term by companies.

Various scientific studies have attempted to clarify matters. The IPCC special report on the consequences of global warming defines carbon neutrality as ‘net zero CO₂ emissions’ in contradistinction to ‘net zero emissions’, which include other GHGs. Moreover, climate neutrality includes in net zero emissions the absence of anthropogenic effects on the climate system (for example through the modification of surface albedo)⁵. The interdisciplinary Oxford Net Zero research initiative proposes seven attributes to lend credibility to all types of carbon neutrality commitments, so as to promote their overall adoption across the board [see Figure 2].

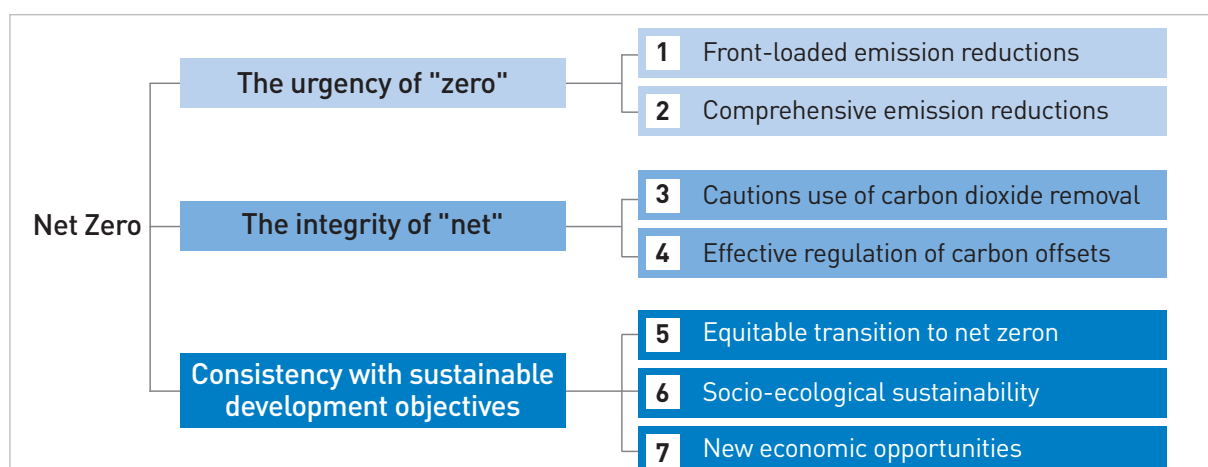


Figure 2 / Attributes of net zero as a frame of reference.

Source: The meaning of net zero and how to get it right, Nature Climate Change, 2021

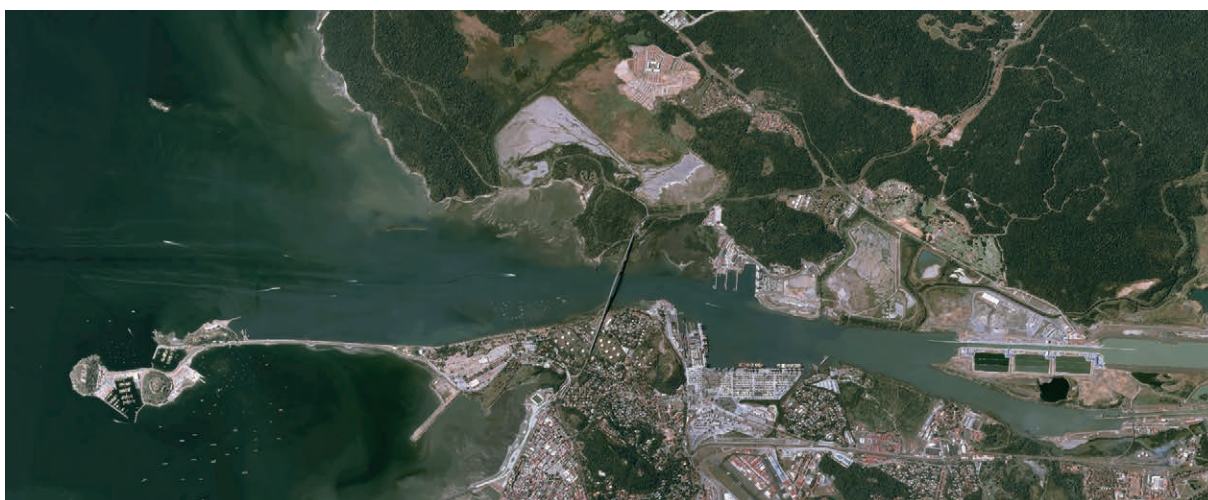
5 <https://www.ipcc.ch/sr15/chapter/glossary/>

There are also a number of initiatives for setting norms and standards. The Science Based Targets initiative (SBTi), carried out by CDP, WRI, UN Global Compact and WWF, calls on voluntary companies to validate the consistency of their GHG reduction targets with the Paris Agreement. Today, it is regarded as an essential reference, if not the most important one. From 114 companies at its inception in 2015, it accounted for 1,040 companies in October 2020, and nearly 2,500 in early 2022. The Climate Pledge, an Amazon initiative, has 217 signatories committed to achieving Net Zero by 2040. ISO, the standards organisation, is working on the development of a voluntary carbon neutrality standard (ISO 14068). An ISO Working Group (TC 207/SC 7/WG 15) was set up in March 2020 following the proposal of a New Work Item (NWI) at the initiative of the British Standards Institution (BSI) behind the [PAS 2060](#) specification for the demonstration of carbon neutrality. Their ongoing reports, however, have been the subject of disagreement over an organisation's ability to claim carbon neutrality by deducting emission offsets.

In France, the Net Zero Initiative (NZI) referential, brought out by the Carbone 4 consultancy, proposes that a business can contribute to collective carbon neutrality by acting on three types of emission - induced, avoided, and negative - which are neither fungible nor additive. For each emission

type, businesses are called upon to measure their performance, set goals compatible with scientific data, and monitor them over time. This approach was endorsed by an ADEME recommendation in April 2021 and updated in July 2021⁶, as well as by AMF in October 2021⁷.

While different studies help to focus on the issue and encourage companies in their efforts, there are problems too. Firstly, standards-based competition creates obstacles for corporate actions by allowing referentials based on different approaches and goals to coexist. Secondly, the initiatives themselves may become the target of criticism over the transparency of methodology and governance, according to whether they are undertaken by businesses or by environmental NGOs. The absence of a benchmark definition of carbon neutrality for business will result in inconsistencies from one type of requirement to another. The Climate Action 100+ investor coalition is therefore developing a corporate strategy benchmark, the prime indicator of which is the existence of a publicly stated net zero ambition. The ADEME agency recommends that companies do not use expressions such as 'carbon neutral company', but opt for the expression 'commitment to collective carbon neutrality' in their corporate communication.



The carbon neutrality of a territory and the carbon footprint of a company differ in terms of how international trade emissions are factored in.

Source: Pléiades Satellite Image – Panama Canal ©CNES 2017, Distribution Airbus DS

6 <https://presse.ademe.fr/2021/07/avis-de-lademe-mise-a-jour-pour-atteindre-la-neutralite-carbone-en-2050-lengagement-de-tous-est-indispensable.html>
 7 <https://www.amf-france.org/fr/actualites-publications/publications/rapports-etudes-et-analyses/entreprises-et-neutralite-carbone-premieres-conclusions-et-enjeux-identifies>



Guidelines for business transformation to Net-Zero

In an increasingly complex landscape of initiatives, norms and standards, companies are struggling to find a definition of carbon neutrality that is relevant to their business and deemed robust by all their stakeholders.

In its recent "Net-Zero Debunked" report, Deloitte and Earth on Board attempt to provide guidance to boards and executives on their commitment to carbon neutrality:

- **Fully grasp the urgency of climate change**– what it means both at the global level and for the company. The company should be aware of risks to its activities and assets, of drivers of change in its value chains and the dynamic changes both in political incentives and regulatory environments, capacity to attract talent, as well as access to financial resources.
- **Review the company's purpose to bring it consistently into line with the global goal of climate neutrality.** The first question to ask is "are our activities compatible with a Net-Zero world"? The risk today is not only of stranded assets, but of stranded activities – activities that will be unfit for a climate neutral economy.
- **Ensure your company collaborates with all stakeholders to develop activities fit for a Net-Zero world.** This dynamic must be driven at all levels of the company, starting with the boards of directors, and involve the entire value chain of the company, suppliers in particular.

- **Analyse current activities, products and services sold, and in that light draw up what a portfolio of activities consistent with a Net-Zero economy may look like.** Plan to change or to replace those activities that do not correspond with a carbon neutral society and do that before your balance sheet is overwhelmed with stranded assets.
- **Ensure Net-Zero plans reach measurable and meaningful reductions in the company's value chain, are timebound and with intermediate targets regularly checked.** Top priority in reducing emissions should be given where the company's expertise and capacity for impact is greater. Initiatives should cover the whole company value chain and focus on its core business.
- **Make sure the claimed sequestered carbon from the company's contribution to the preservation and enhancement of carbon sinks, is reliable and permanent.**

For more information:

<https://www2.deloitte.com/fr/fr/pages/sustainability/services/articles/net-zero-debunked.html>



This wind turbine installed by Imerys in its Blackpool quarry (Cornwall, UK), supplies 180,000 kWh a month of cost-efficient low-carbon energy
© Imerys

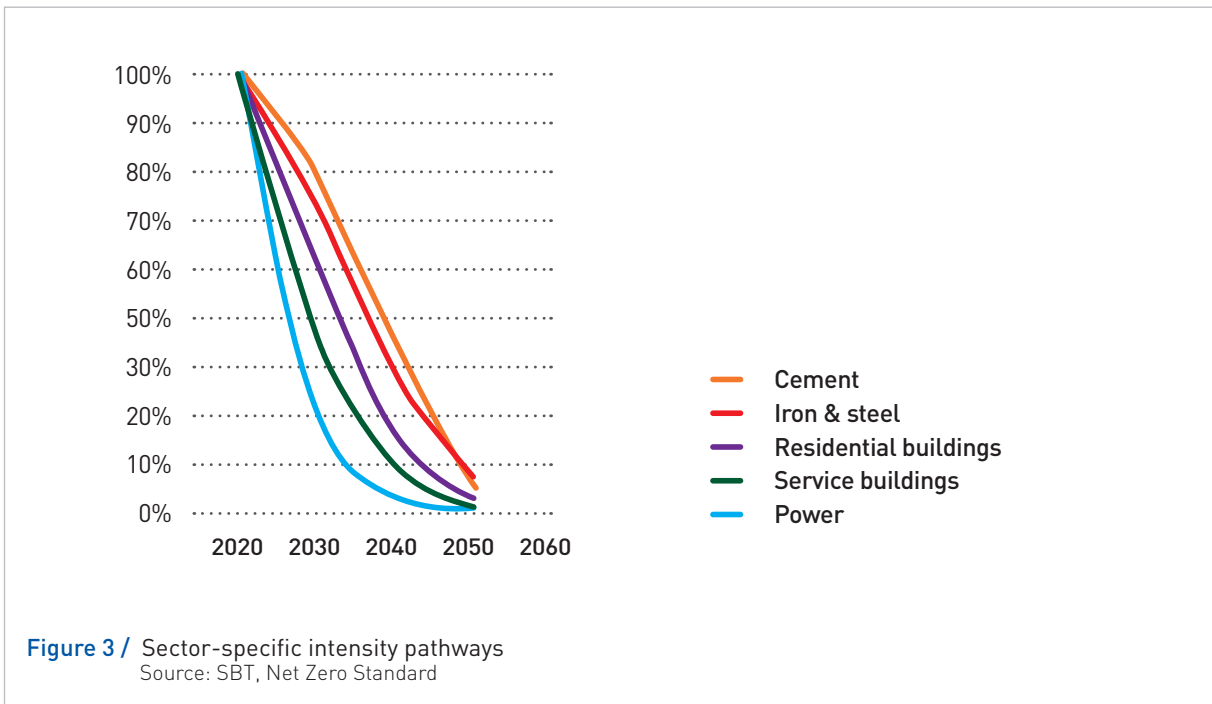
2. Reducing emissions is a priority for all

The ZEN 2050 study showed that achieving carbon neutrality in France led to an annual reduction in GHG emissions of around 4.5%, a pace comparable with the phasing out of coal in the '70s and '80s. However, the challenge is totally different from what it was then, as it involves targeting a host of sectors where emissions are diffuse and action particularly complex. The required reductions are estimated to be all but 100% (90%) for the construction and transport sectors, substantial (70-90%) for industry and energy production, and moderate (~50%) for agriculture.

For businesses, the absolute required reduction targets to be met are similar. For example, one of SBTi's methodologies for defining long-term targets (2020-2050) aim for absolute reductions of around 80% for the land, forestry and farming sector, 91% for metalworking, 94% for cement and up to 97% for energy production (see Figure 3). The definition of short-term targets is based on a minimum annual linear rate of 4.2% (with variations for some sectors).

Reduction targets gradually increase in line with growing ambition. The IPCC special report on the consequences of 1.5°C global warming has helped to clarify the scope of the Paris Agreement, which aims to 'limit warming to well below 2°C and, if possible, to 1,5°C'. This has led to an upward revision of corporate greenhouse-gas emissions reduction targets, particularly with the help of the SBTi standard.

One key issue is monitoring the consistency between long-term targets under the Paris Agreement and short-term targets that enable reductions to be achieved immediately. For the sake of compatibility, the SBTi Net Zero standard also requires alignment of corporate reduction pathways with the Paris Agreement. It factors in carbon sinks and allocated carbon credits only up to residual emission levels so as to neutralise them.



3. Sequestration: a useful solution to be used sparingly

A new development in carbon neutrality strategies is the attention given to carbon sequestration. This solution has two **key benefits**. First, the significant role of carbon sinks in achieving the Paris Agreement goals. A study published in the journal PNAS⁸ in 2017, and widely referred to since, considers that nature-based solutions could represent 30-40% of the CO₂ reductions required by 2030. Second, sequestration projects could deliver significant social and environmental co-benefits (soil fertility, air quality, biodiversity and water resources protection, etc.).

However, there are several **major risks** associated with such projects. To start with there is the risk that an 'offsetting' approach would limit or postpone the structural transformations needed to reduce emissions, since biological storage capacity is physically limited. Then there is the fact that long-term storage undermines the sustainability of carbon credits generated. This is particularly true in a context of growing climate impacts (megafires, change in species range).

The environmental and social **integrity** of carbon credit markets is of major importance to the companies that use them. This has often been criticised in the past with regard to the Kyoto Protocol's voluntary markets and clean development mechanisms. Real project additionality, the methods for calculating tonnes of captured carbon, and undesirable impacts on local populations and biodiversity are the focus of attention. Businesses commonly use certification systems for biodiversity (CCBA – Climate, Community & Biodiversity Alliance) as well as carbon (Verra-VCS, Gold Standard, and France's Bas Carbone (low carbon)).

Sequestration projects may have different goals. Historically, they first served as evidence of a company's environmental commitment, similar almost to patronage. In neutrality strategies this has changed. In aviation and other sectors where emissions are difficult to reduce, purchasing carbon credits can be a transitional solution

during the time required for developing technologies to be mainstreamed. Approaches like insetting, i.e. the implementation of projects within the company's value chains, are gaining ground, particularly in sectors using natural products (food, textiles, etc.). Unlike offsetting, which is an investment outside the value chain, insetting helps to secure supplies, regenerate ecosystems in use, and even participate in local socio-economic development. To this end, companies are increasingly developing their own projects, which also allow them to secure carbon credits in a highly uncertain environment.

In 2020, the voluntary carbon market in France comprised 78 projects generating 11 MtCO₂e worth €50m, 90% of which was bought by companies⁹. The majority of the projects concern forests, renewable energy, and agriculture. Blue carbon is an area of special focus. At the One Ocean Summit held in Brest in February 2022, France launched an international benchmark coalition to help finance the restoration of coastal ecosystems (mangroves, seagrass and seagrass beds).

Technological solutions too provide great storage potential. French storage capacity is estimated at 43 MtCO₂/an¹⁰. However, their deployment requires substantial infrastructure investment (€100/TCO₂ is the figure being bandied about) in the creation of facilities for separating CO₂ from other industrial gases, storage sites, and a pipeline network to connect the two. Like many industrial projects, geological storage also raises issues of local acceptance. Taking into account these constraints, French storage potential is probably between 20 and 24 MtCO₂/year. The direct capture of CO₂ diffused in the air is very energy and resource consuming and, therefore, only feasible in the vicinity of unavoidable energy sources, because the energy would otherwise be lost. The resulting cost of reduction is not yet known.

8 Natural climate solutions, <https://www.pnas.org/content/114/44/11645>

9 Inventory of carbon offsetting in France, 2020 edition. https://www.info-compensation-carbone.com/wp-content/uploads/2021/08/Brochure-INFOCC_2020_vf.pdf

10 Capture and geological storage of CO₂ (CSC) in France, Technical Opinion, ADEME, 2020.



Defining an ambitious, science-based climate strategy

Faced with the challenge of climate change, Kering has chosen to base its climate strategy on the scientific framework defined by the Science-Based Targets Initiative. The group is following a 1.5°C pathway and is committed to reach net-zero emissions by 2030.

Meeting these targets requires the group to achieve an absolute 90% reduction in Scope 1 and 2 GHG emissions by 2030, and a 70% reduction per unit of value added in Scope 3 GHG emissions by 2030, compared to 2015. The group is also aiming for 100% renewable electricity supply by 2022. Finally, Kering is investing in offsetting projects to match its residual Scope 1, 2 and 3 emissions, mainly through nature-based solutions such as the protection, sustainable management and restoration of natural ecosystems (forests, meadows, etc.), or regenerative agriculture projects.

Such ambitions require quantifying and understanding its impacts throughout its value chain. To do so, Kering has been using its pioneering Environmental Profit and Loss

account (EP&L) for the past 10 years. This tool measures GHG emissions and indicators relating to the use of land, water and air of its activities. This EP&L allows the Group to give priority to actions that offer benefits for the climate, nature and living conditions, and gives the Houses the possibility of building specific initiatives.

To date, the group has achieved 69% alignment with the Kering Standards in its purchasing, which is the main lever for reducing its environmental impact. Energy efficiency programs have reduced the carbon intensity of the stores by 30% since 2015 and the improvement of manufacturing processes through the Clean by Design program has reduced their CO₂ emissions by 12% per year.

Kering's climate strategy recognises the fundamental interconnection between climate, biodiversity and circularity. Together with the group's Biodiversity and Circularity strategies, it forms a coherent, credible and science-based approach that harnesses many synergies to achieve more powerful results.

4. Avoided emissions: assessing decarbonisation solutions

Studying avoided emissions trends is useful to assess emissions reductions delivered by the production and supply of certain products and services. The exercise involves assessing a company's contributions to reducing the emissions of other players, even if they increase its own emissions, for example by supporting the manufacture of wind turbines or insulation materials, or the provision of certain services (see Nexity box).

However, quantifying avoided emissions is a complex task, the main difficulty being the choice of a benchmark scenario against which the emissions reduction is measured. There are also the more traditional methodological difficulties related to life cycle analysis, scoping, and data availability and quality. While the concept is useful, especially for making trade-offs between different projects,

there are major difficulties in employing this indicator at an aggregated level, such as to allocate reductions among various players in the value chain (manufacturer, distributor, user), or consolidate avoided emissions.

Acknowledging these limitations, EpE members made a series of recommendations in 2017 on the proper use of the concept⁽¹¹⁾. The relevance of the concept of avoided emissions to its application on a global scale remains in any case limited. There are different ways to help companies measure such emissions (see EpE guide p.19). The WBCSD plans to issue recommendations in late 2022 clarifying the context in which claims of avoided emissions are relevant to the overall carbon neutrality goal.

11 <http://www.epe-asso.org/emissions-evitees-septembre-2017>



Developing services to help clients reduce their carbon footprint

Nexity is France’s leading integrated real estate group, with business operations in all areas of real estate development and services tailored to the needs of individuals, companies, institutional investors and local authorities. Mindful of its responsibility and its impact, Nexity set out a carbon trajectory in 2015 – which was validated by the SBTi in 2021 – covering most of its Scope 3 emissions, mainly arising from its real estate development activities. The group takes part in sector-wide discussions on how property developments can contribute to carbon neutrality, and is also backing plans to create a French low-carbon certification for construction projects.

In addition to its trajectory for new buildings, Nexity aims to become a leading player in reducing the carbon footprint of existing properties – a key priority for cutting France’s overall carbon emissions – thereby helping avoid emissions on an even greater scale by offering new solutions to its clients.

For a number of years, through its Real Estate Services to Individuals business, Nexity has been developing solutions to help condominiums carry out energy efficiency upgrades, including the 2018 signing of its first Green Deal

with the Plan Bâtiment Durable, France’s sustainable building plan, followed by a second in March 2022, with the aim of renovating 1,000 homes by year-end 2025. At year-end 2021, more than 300 building renovations were either in the planning stage or covered by project-owner support or project management contracts, and more than 60 condominiums had been renovated, achieving energy savings of 30% to 60% depending on the project.

Nexity is also taking action to improve the environmental performance of existing commercial properties through its Real Estate Services to Companies business, in particular its Property Management for Companies services. At year-end 2021, 1,600,000 sq.m of assets were covered by commercial property energy reduction support contracts, and 460,000 sq.m had been assisted as part of the implementation of an SRI policy. Nexity is also helping develop the next BBCA Exploitation certification (for low-carbon building operations), which aims to move beyond focusing solely on energy use and instead take a comprehensive approach to all the opportunities for reducing carbon emissions in building operations.

March 2018

Avoided emissions
Companies assess their climate solutions

This guide, drawn up in collaboration with EpE member companies, formalises a series of recommendations on the proper use of the avoided emissions concept <http://www.epe-asso.org/emissions-evitees-September-2017>

B Consistency over space and time

While the goal of carbon neutrality by 2050 (or 2060 or even 2070 for some states) is now largely consensual, the development of adequate short-term policies and regulatory frameworks to achieve it remains a key challenge.

The clear signals given by the Paris Agreement led to a wave of commitments to carbon neutrality by businesses, and to the success of several carbon-neutral initiatives, as the COP26 in Glasgow clearly highlighted. Furthermore, long-term goals can be used to define and assess the relevance of short-term actions. These two dimensions are both necessary and inseparable. The emission reduction targets validated by SBTi basically focus on 2025 or 2030, but validation is based on a benchmark pathway established until 2050.

The **roadmaps drawn up by businesses** paradoxically reflect the opposite logic: short-term clarity, long-term uncertainty. In the near term, against the background of a fairly inflexible technological and external (especially energy) environment, companies' actions primarily focus on ready-to-use decarbonisation solutions. Since those actions appear to be inadequate to achieve long-term goals, new technologies and business models need to be developed. Some even have to be planned and built right now. This is particularly the case for industrial sectors with long investment cycles. The goal of the cement industry's decarbonisation roadmap is to reduce its relative emissions (per tonne of cement produced) by 24% by 2030 through greater energy efficiency at plants, the use of alternative fuels, and the reduction of clinker content in cement. By 2050, still experimental materials recycling and carbon capture, transport, storage and utilisation (CCS - CCU) technologies will need to be onstream to achieve an 80% reduction in emissions¹². These profound changes call for an assessment of the production costs of materials as well as business models. Will the volume of new materials be constant, grow, or decrease? What will be the effects on

business models of a slowdown in urban sprawl and greater focus on building retrofits, which are also public policy goals? The issues go beyond the profitability analysis of an industrial investment.

How to match **time horizons** raises other strategic questions for businesses. To have the means to invest in the future, they must deliver short-term financial returns to their shareholders and investors, while providing sufficient visibility of how they are preparing their ecological transition and planning to stagger it over time. Businesses must meet the same expectations among employees and customers if they are to earn their long-term trust. The paradox is that current economic models are still centred around a world built on fossil fuels. Funding R&D in new solutions is often still dependent on financial flows from the sale of fossil-fuel products. Companies follow a different pace of transition for their product markets and for the financial community. The risk of gradualism is to invest in facilities that would lock in a certain level of future emissions without the possibility of reducing them (lock-in effect).

Geographical differences are another challenge. The vast majority of large French companies do the bulk of their business internationally¹³. A Deutsche Bank Research study in 2017 found that CAC 40 companies generate 57% of their sales in Europe, 15% in the United States, 23% in emerging countries (including 2% in China) and 5% in the rest of the world. This means they face international competition and heterogeneous regulatory, technological, and market contexts. While the European Commission's Green Pact and the 'Fit for 55' package provide an ambitious and consistent framework on the pathway to carbon neutrality in Europe, the same is not true everywhere. For example, TotalEnergies and Renault Group have a climate strategy with less rapid decarbonisation rates for activities outside Europe.

12 <https://www.economie.gouv.fr/plan-de-reliance/decarbonation-industrie-feuille-route-filiere-ciment>
13 <https://www.lerevenu.com/bourse/coulisses/des-societes-du-cac-40-de-plus-en-plus-internationales>



Looking ahead: different ambitions for different horizons

Air Liquide's business is deeply rooted in a long-term vision of the future, and backed by the integration of financial and non-financial performance. The actions, decisions, and developments made, are based on long term, sustainable results, which is necessary to make Air Liquide's vision a reality. The group's climate strategy is structured around three milestones, for the short, medium, and long-term, each milestone with its own targets and ambitions:

- in the long term, based on climate science, the need to achieve carbon neutrality by 2050 ;
- in the medium term, ambitious objective of reducing emissions by 33% in 2035 compared to 2020, which implies an evolution in the way activities are performed ;
- in the short term, by integrating the reduction of emissions into the management and steering processes of our investments, in the development of new low-carbon offers, technologies and expertise.

Air Liquide is present in 75 countries: the deployment of its climate strategy throughout the group is accompanied by localised geographic deployment strategy that takes into account local conditions, such as the level of industrial and economic development of the different countries where the group operates, the climate policies in place, the appetite of local communities, and the availability of low-carbon energy, which is needed to support the decarbonisation of the group's activities and those of its customers. Thus, deploying the climate strategy relies on internal teams and processes to ensure overall coherence, while maintaining the financial performance that makes it possible to finance this transition.



Decarbonising production processes through energy efficiency and renewable energy

Faurecia is targeting neutrality on Scopes 1 & 2 by end of 2025. The corresponding commitment to SBTi is a minimum reduction of 80% by 2025 against 2019, and 46% on controlled Scope 3 (excluding product use) by 2030. This roadmap has been validated in November 2020 as "in line with a 1.5°C trajectory" and "the most ambitious designation available through the SBTi process".

This Scopes 1&2 plan is also the basis of our "sustainability framework" supporting our emissions of green financial instruments, like senior green notes (€400M in March 2021), senior sustainability-linked notes (€1200M in November 2021) or ESG-linked Schuldscheindarlehen (€700M in January 2022).

As we manage about 300 plants globally, we have devised a centralised one-shot approach, whereby we team with one or two international service providers. Such approach is scalable and will allow as necessary for a quick addition of sites from recently acquired Hella company (January 2022).

For energy saving, we rely on the support of Engie Impact and Schneider Electric for equipping our sites (plants, R&D centers and headquarters) with hardware and software and we target a global minimum average of 15% intensity reduction by 2023 against 2019.

For on-site renewable energy production, with the management support of KPMG, we have contracted with Engie and EDP (Energias de Portugal) to equip about 200 plants with a minimum target of 100 MW (peak power), representing about 7% of our current electricity consumption.

For procuring the balance of renewable electricity, we are negotiating regional "additional" virtual Power Purchase Agreements with the support of Schneider Electric. We target all countries, where such commercial markets exist. If required, the balance would be covered by international Energy Attribute Certificates.

C Identifying and prioritising strategy

To meet their emissions reduction targets, companies have several levers in four broad areas:

- energy efficiency, i.e. a reduction in the amount of energy required to meet the same need;
- substitution of decarbonised energy (nuclear, wind, solar, biomass, etc.) for energy from fossil fuels (oil, gas, coal). The electrification of processes and equipment is the most common way of doing so, provided the company ensures it uses decarbonised primary sources;
- changes in use or business models that make it possible to reduce the amount used due to moderation of the need itself (restraint);

- reduction of non-energy process emissions (nitrous oxide produced by agricultural practices, CO₂ from calcination of limestone in cement manufacture or from metalworking, etc.).

A variety of approaches exist to enable companies to select priority levers and build a coherent overall strategy with which to achieve their low-cost decarbonisation goals, while maintaining sufficient profitability and financing capacity. The approach most frequently used consists in mobilising all the levers, while determining the timing and sequence of different actions. Several tools are available to define the investment and action pathways.

1. Assessing the materiality of emissions and solutions

Materiality analyses enable businesses to identify the most significant issues, for example in terms of their impact, their ability to contribute to short- and long-term emissions reductions, and their stakeholders' perceptions.

Materiality matrices are historical tools used in CSR strategies that allow economic, financial, societal or environmental issues to be prioritised according to the ambition of the company and the expectations of its stakeholders.

A 2021 South Pole survey assessed the main motivations of businesses committed to carbon neutrality. Customer demand for low-carbon products and services was the top reason (74%), with demand being strongest among large industrial customers due to their commitments and duty of care, as well as end-customers. This was followed by brand positioning (62%), resilience (42%), reputation risk (38%), regulation (31%), investors (23%), competitors (22%), supply chain risk (21%), and finally employees (16%).

To assess the materiality of carbon impacts, carbon footprint calculation tools are helpful because they allow companies to assess the emissions produced directly or indirectly by their activities, and determine the volumes emanating from their own processes, energy and component purchases, or product use. The main sources of emissions differ across sectors (see Figure 4) and businesses. For SNCF, Scopes 1 and 2 account for 30% of emissions, essentially due to electricity and fuel purchases for propulsion. For Renault Group, Scopes 1 and 2 account for only 1.5 % of the total, with almost all emissions related to the exhaust gas produced by vehicles sold (70%), and to the manufacture of fuels and components.

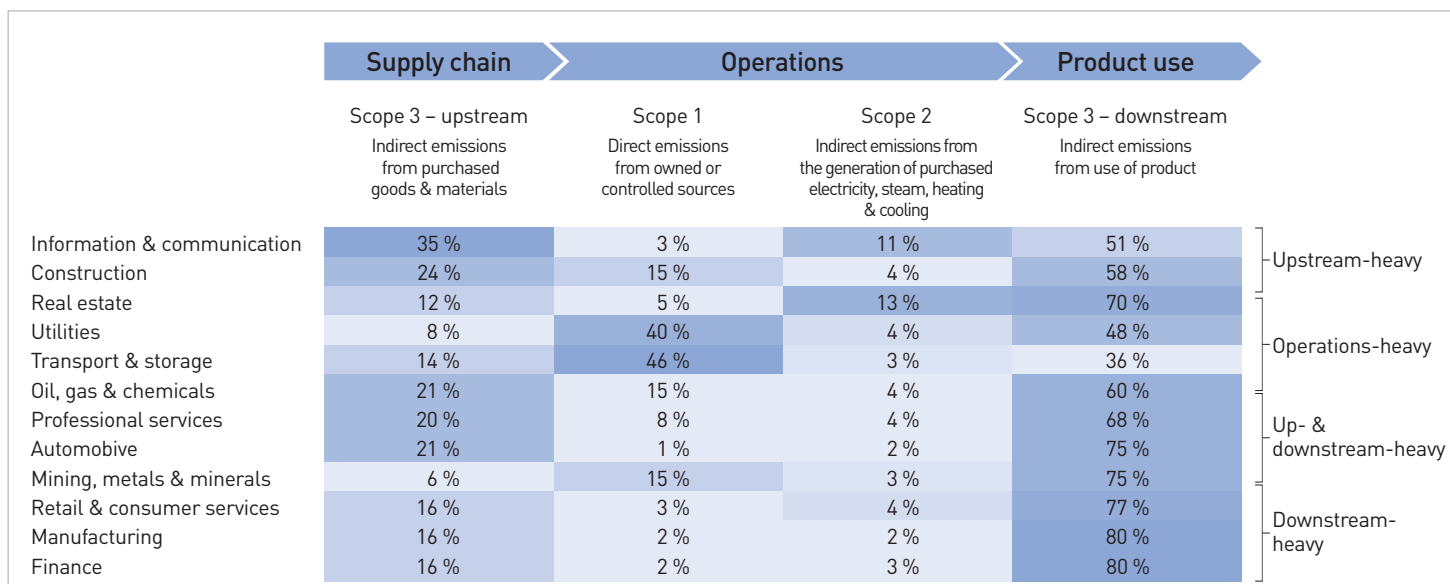


Figure 4 / Emissions type by industry
Source: Accenture - reaching-net-zero-by-2050



Mobilising multiple decarbonisation levers

The group's climate commitments aim to eliminate the greenhouse gas impact of its industrial operations¹ by 2040 for all its activities except those related to soda ash and its derivatives, for which the deadline is before 2050. A first stage is set for 2030 with a 30% reduction in absolute emissions², also including phasing out coal in energy production.

Transitioning the energies used towards zero carbon is the first lever. This transformation is already underway at about a hundred of Solvay sites around the world, with switch to renewable electricity (already completed for three business units in the United States) and sustainable heat (Dombasle Energy). In the long term, a 45% reduction of the group's emissions is planned.

The second major lever is technological innovation. It is expected to trigger a 30% reduction thanks to the electrification of processes and the development of clean technologies that prevent fatal emissions from some productions. The ramp-up is spread over time up to 2040, taking into account the level of maturity of the technologies and research and development projects. The emissions identified as particularly hard to abate account for 15% of the total and they are expected to be reduced between 2040-2050, allowing time for technologies and projects to emerge. Finally, residual emissions, expected to be 10%

of the initial emissions, are mainly offset by nature-based projects with sequestration and high environmental integrity.

The 36 energy transition and clean technology projects already confirmed have enabled the group to achieve a structural reduction in emissions of 11% between 2018 and 2021. This will reach 20% when all these projects are operational by the middle of the decade.

The transformation also involves operating models and employees' mindset: introducing new governance with the construction of roadmaps for each activity and the management of uncertainties in the medium and long term (2030-2040-2050); an internal carbon price is set at €100 per tonne of CO₂ and applied to all investment decisions worldwide in order to guide them towards carbon neutrality and control the impact of organic growth; energy supply chains are set up; public support for innovation and investment for the energy transition is mobilised, making it possible to maintain the competitiveness of activities and economic sectors throughout the transition.

1 scope 1&2
2 reference year 2018

2. Considering cost and efficiency: merit order

The so-called merit order approach identifies levers based on their cost and GHG emissions reduction potential.

The economic approach is the most common. It associates a reduction cost (in euros per tCO₂e) with the various levers, enabling technologies to be classified by increasing cost and selected on the basis of negative cost and long-term cost-effectiveness, compared to those with a net cost.

It helps to identify the carbon price level at which the solution becomes cost-effective, and therefore to plan for it.

Implementation may, however, follow a different order. The adoption of costly solutions before capitalising on the full potential of cost-effective solutions may paradoxically be relevant at times^[14].



Rapid action based on a strong ambition

On 21 January 2021, the Iliad group announced its Climate ambition with its commitments to reduce carbon neutrality by 95% on direct emissions and 30% on indirect emissions by 2035 with one priority: do things right and act quickly!

In a context where global digital emissions (3-4%) could double by 2040 due to the strong growth in usage¹, it is essential to measure exhaustively and act on the group's entire carbon footprint, including direct emissions (network consumption, company vehicles, etc.) as well as all of Scope 3 (equipment manufacturing, customer consumption, roaming, etc.).

Firstly, by activating reduction levers that are rapidly operational, such as the electrification of the vehicle fleet, which accounts for 95% of Scope 1 emissions. Secondly, by focusing on Scope 2, which represents 75% of direct emissions, mainly linked to the consumption of electricity for fixed and mobile network infrastructures and data hosting (data centres).

By the end of 2024, with a target of 30 million fibre-optic connections and more than 25,000 mobile sites deployed in France, the priority is to improve the energy efficiency of fixed and mobile network equipment. This involves three combined actions:

- switching to more efficient technologies (fibre, 5G) ;
- investing in the latest generation of equipment, which consumes less energy, while at the same time taking care not to encourage excessive obsolescence of terminals;
- technological innovation to provide data centres with very high environmental performance (Scaleway adiabatic cooling process).

To act quickly, the objective of 100% coverage with electricity from renewable sources has been reached in France and Italy by 2021 and will be reached by 2022 for Poland, which is the equivalent of 138,000 tonnes of CO₂ avoided. The Iliad group has also chosen to adopt demanding and rigorous sustainability criteria:

- by choosing only local production units, as close as possible to the places of consumption;
- by giving priority to supporting recent installations commissioned after 2015, exclusively solar and wind power;
- by relying on the EKOenergy ecolabel, which guarantees a limited impact of the installations on nature.

Finally, the Iliad group is already contributing to the Low Carbon Label in France thanks to 8 projects which will enable the capture of 22,500 tonnes of CO₂ over time. These afforestation and reforestation programmes were planted during the winter of 2021 and selected for their co-benefits on biodiversity, soil preservation and local employment.

1 Impacts environnementaux du numérique en France
Version 0.8 - Janvier 2021 - GreenIT

14 Adrien Vogt-Schilb, Stéphane Hallegatte. When starting with the most expensive option makes sense: Use and misuse of marginal Abatement cost Curves. 2011.
<https://hal.archives-ouvertes.fr/hal-00626261v1>

In a tool mix, the most rational strategy may not be the one suggested by the reduction cost classification. A simple example is building energy retrofits, where it is more efficient for insulation work to precede boiler replacement as an oversized boiler is too expensive and cannot perform efficiently. An optimised sequence would require insulation (energy efficiency) first, and a boiler change and transition to decarbonised energy second. But reduction costs do not lead to this outcome, and most often the boiler is changed first, thereby affecting the timely execution of the overall retrofit.

The purpose of drawing up long-term roadmaps is to avoid such discrepancies.

The approach for defining long-term global roadmaps is also used for biodiversity protection (avoid-reduce-compensate sequence), and by the 2008 European Waste Framework Directive which introduces the preferential waste treatment sequence (avoid-reuse-recycle-energy recovery-storage).

3. Factoring in intangibles: the risk-based approach

Because purely economic approaches do not necessarily yield the best choice of decarbonisation levers, approaches factoring in intangibles could complement them.

Risk analyses consider both the likelihood of a risk materialising and its impact (new regulations, investor disaffection for the sector, higher carbon prices, changes in competition or the market, vulnerability to natural hazards, technological accidents, etc.).

A WBCSD⁽¹⁵⁾ report identifies three levers for businesses seeking to better integrate climate resilience into their risk management strategies:

- reducing emissions which lowers vulnerability to transition risks (regulatory, market, etc.),
- strengthening the capacity to adapt to physical climate risks with a view to business continuity,
- lastly, transforming companies by maximising value for society (customers, employees, stakeholders) and the biosphere, as part of an approach based on the search for opportunities.

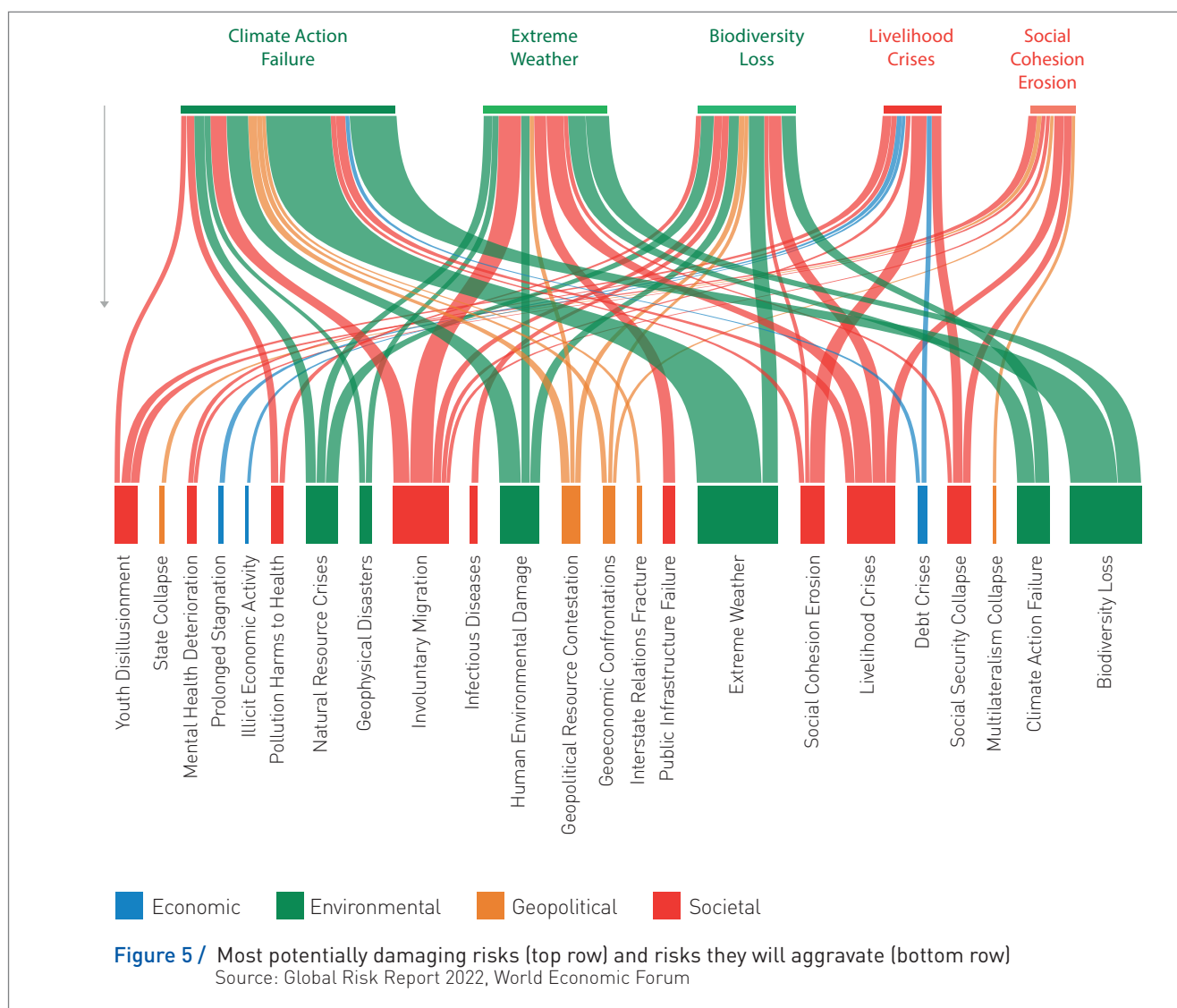
D Carbon and other issues: one and the same ecological transition

The climate emergency, fully understood and embraced by all stakeholders, is the primary driver of ecological transition. This, however is not the only crisis that society and business face. The interactions between environmental, economic, geopolitical, societal and technological issues are becoming increasingly numerous and significant. Corporate climate strategies reflect this growing complexity, especially as the transition to be made is bound to be a unique opportunity to address those issues. Given the depth of the planned transformation, it does not make sense to address the climate issue first and wait until 2050 to deal with the Earth's sixth species extinction, particularly as there are many synergies between the solutions to the two problems.

Similarly, past attempts have shown that we cannot manage the decarbonisation of our society without first making the transition affordable and addressing the social challenges.

Decarbonisation is not only a driver of change, but also an opportunity to build other urgent social and environmental issues into new lifestyles and economic models. The Global Risk Report, an annual publication of the World Economic Forum based on analyses by, and surveys of, a panel of experts and political and economic leaders, recently highlighted the linkages between global risks, including the 'threat multiplier' effect of environmental crises. The impact of climate crises on forced migrations, for example, is particularly striking especially in light of poor international cooperation on the issue. Another recent example is the pandemic whose effects have greatly exacerbated the risks of an erosion of social cohesion and of livelihood crises (see Figure 5).

15 Business Climate resilience: Thriving Through the Transformation <https://www.wbcsd.org/Programs/Climate-and-Energy/Climate/Climate-Action-and-Policy/Resources/Business-Climate-Resilience-Thriving-Through-the-Transformation2>



1. Climate, biodiversity and natural resources

The institutionalised handling of major environmental issues at the end of the 20th century mainly involved the separation of issues (Climate Convention, Convention on Biological Diversity, Convention on Desertification, Montreal Protocol on the Ozone Layer). This approach facilitated the identification of simple, pragmatic solutions (e.g. for the ozone layer), but also, unfortunately, incomplete ones, that failed to address the root causes or call our development model into question. As a result, the climate has enjoyed strong institutionalisation, backed by extensive scientific research and the universal adoption of the tonne of carbon equivalent concept, which has enabled operational monitoring and been factored into public and private economic activities. Today, there are multiple calls for the convergence of actions to address environmental challenges in line with the progress of scientific knowledge highlighting common causes, risks of single-issue solutions, and synergies between solutions.

In 2019, the first IPBES Global Assessment of Biodiversity and Ecosystem Services Report^[16] clearly identified climate change as one of the five major factors responsible for biodiversity loss. In 2021, the conclusions of the IPCC-IPBES workshop^[17] also highlighted the interrelated nature of climate and biodiversity crises, with particular emphasis on their common causes and the consequences of their combination. These reports have provided a scientific basis for understanding the positive and reciprocal consequences of targeted actions for biodiversity conservation and restoration, as well as climate change mitigation and adaptation. In highlighting the physical and environmental limitations associated with mainstreaming certain natural and technological emissions reduction and atmospheric carbon sequestration solutions (afforestation, bioenergy, BECCS, etc.), the reports identify a key issue for business, namely that the solutions devised and deployed for climate can impact biodiversity

16 <https://ipbes.net/global-assessment>

17 <https://ipbes.net/events/ipbes-ippcc-co-sponsored-workshop-report-biodiversity-and-climate-change>

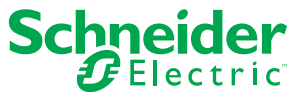
and will succeed in the long run even better if they benefit both issues and prove resilient to global warming¹⁸.

Climate and natural resources are also closely linked because the exploitation of those resources is the source of most GHG emissions.

According to the International Resource Expert Group (IRP), the extraction, harvesting and transformation of fossil, biomass and ore resources alone - without even considering their use and end of life - actually contribute to half

the world's annual greenhouse gas emissions (excluding emissions from land use and land-use changes), and to over 90% of the world's biodiversity loss and water stress¹⁹.

The Ellen MacArthur Foundation²⁰ reports that the development of a circular economy would reduce greenhouse gas emissions by 83% and lower primary resource consumption by 53% in Europe by 2050.



Combining climate and biodiversity strategies

Schneider Electric is the first company to assess its biodiversity footprint using CDC Biodiversité's "Global Biodiversity Score" tool in 2020. In 2007, the company had already been the first to carry out its full carbon footprint. These complementary approaches will enable the company to identify priority action levers in the value chain, in order to develop a strategy aligned with the objective of preserving and restoring biodiversity, which complements the Net Zero Carbon commitment.

As a leader in the digital transformation of energy management and automation, the company believes that progress can only be holistic. The fight for human rights, the reduction of carbon emissions, the restoration of biodiversity, the building of relationships of trust between stakeholders and the promotion of new skills go hand in hand.

The CO₂e metric has played a key role in mainstreaming climate issues. A similar metric is needed to guide the fight against biodiversity loss. [The biodiversity footprint](#) makes it possible to identify significant issues and priority action levers and thus avoid taking action with symbolic measures:

- In Schneider Electric's biodiversity footprint, greenhouse gas emissions account for 70% of the pressures on terrestrial biodiversity, followed by land use.

The group's strategy, and in particular its [trajectory towards rapid carbon neutrality](#), will therefore have a considerable impact on limiting biodiversity loss. The company is also working to make energy systems intelligent in order to reduce consumption and carbon emissions.

- The impacts of the operational perimeter (known as Scopes 1 and 2) represent only a modest part of Schneider Electric's biodiversity footprint (<5%); the main challenge lies in the indirect impact. Within the supply chain (known as Scope 3 upstream), the two main sources of impact identified are the use of wood (used for packaging and pallets) and the extraction of metals (particularly copper, a key resource in the sector). Increasing the traceability of the supply chain is key to better protect biodiversity. Schneider Electric calls for the emergence of new digital traceability and certification schemes to provide information along the value chain on the origin and impacts of resources. By being a key player in innovation for product and solution traceability, Schneider will provide an essential contribution to the mobilisation of businesses and consumers for the restoration of biodiversity.

18 Ibid.

19 Global Resources Outlook 2019, UNEP & IRP
https://www.resourcepanel.org/sites/default/files/documents/document/media/unep_252_global_resource_outlook_2019_web.pdf

20 Growth Within : A circular economy vision for a competitive Europe, 2015, Ellen MacArthur Foundation, Stiftungsfonds für Umweltökonomie und Nachhaltigkeit (SUN), and McKinsey Center for Business and Environment
<https://unfccc.int/sites/default/files/resource/Circular%20economy%203.pdf>



The circular economy at the heart of decarbonisation

In early 2022, *Séché Environnement* presented its decarbonisation strategy. The group's first engagement is to bring its emissions down (Scopes 1 and 2 in France) by -25% in 2030 by decarbonising its industrial processes. In parallel of reducing its own emissions, *Séché Environnement* is involved in decreasing the emissions of its customers by progressively improving the avoided emissions by more than 40% by 2025 through circular activities.

Séché Environnement is planning to develop its activities in the high value-added recycling of materials such as solvents. By regenerating solvents, the production of which usually requires the use of hydrocarbons, *Speichim Processing*, a subsidiary of *Séché environnement*, enables its industrial customers to significantly cut down their carbon footprint: the CO₂ emissions of a recycled solvent are on average 80% lower than those of a new solvent¹.

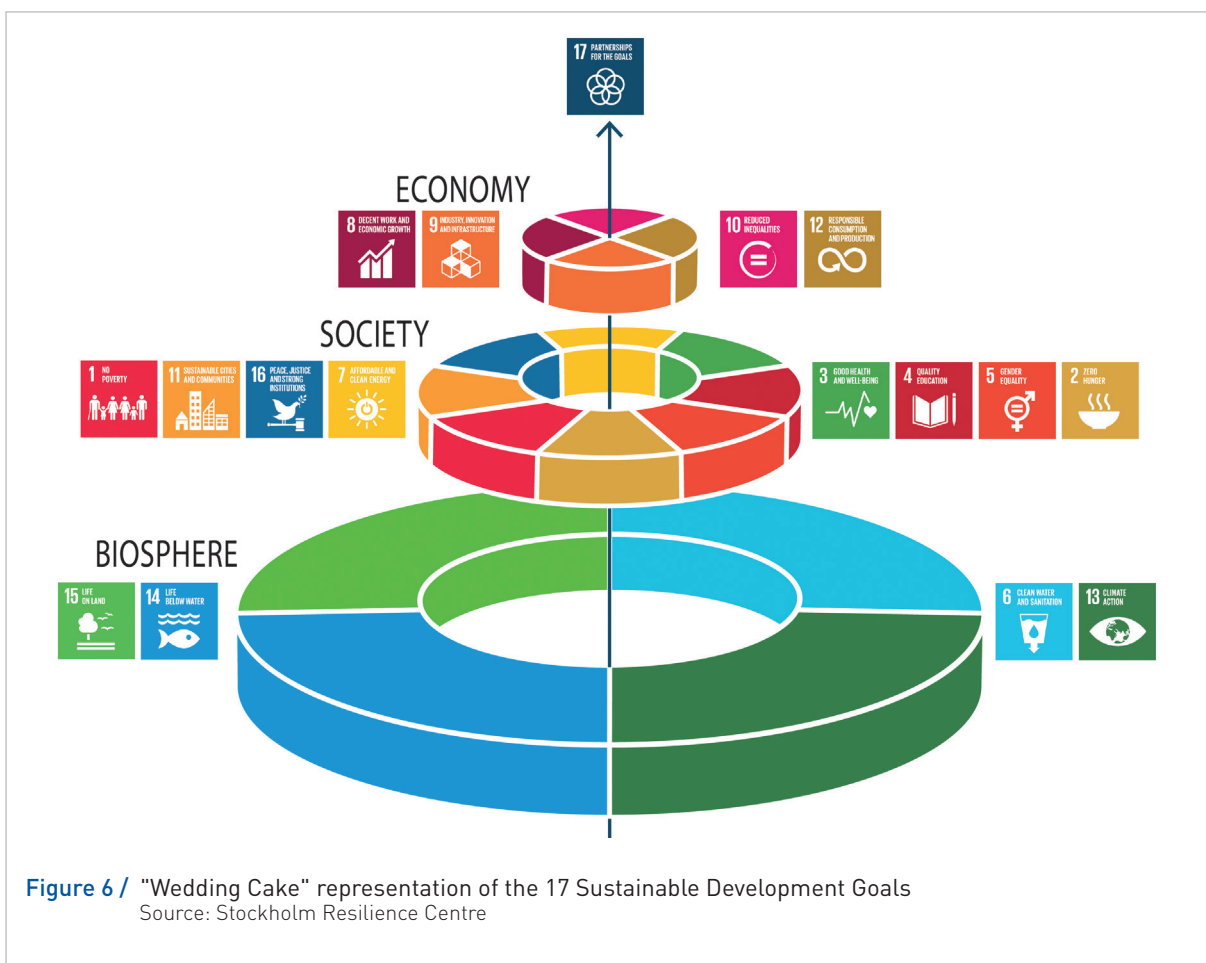
Secondly, low-carbon energy production is a key lever for the implementation of a circular economy and decarbonisation strategy. The electricity, heat and biogas generated by waste treatment activities replace customers' consumption of fossil fuels (coal, petrol, or oil). In Salaise-sur-Sanne (Isère), for example, the hazardous waste treatment center of Tredi, a subsidiary of *Séché Environnement*, and GIE OSIRIS commissioned a new heating network in 2020. This recent facility, financially supported by ADEME, is set to deliver a total of 600,000 tonnes of vapour to the industries of the Roussillon chemical platform, half of their energy needs.

¹ "Carbon Footprint of Recycled Solvents", Study for the European Solvent Recycler Group (ESRG), August 2013.
https://esrg.de/media/PDF/Study_print_090514.pdf

2. Ecosystem health as well as social and economic prosperity

In September 2015, the UN adopted the 17 Sustainable Development Goals (SDGs) in response to the global challenges that need to be addressed by 2030. While each is of equal importance, there are many interconnections and interdependencies between them. To better visualise them, the Stockholm Resilience Centre has developed the so-called 'wedding cake' model, illustrating the dependencies between biosphere, society and the economy that can be summed up thus: 'a healthy biosphere is a condition for a balanced society, itself a condition for a sustainable economy' (see Figure 6), or as the WBCSD puts it 'there is no business on a dead planet'.

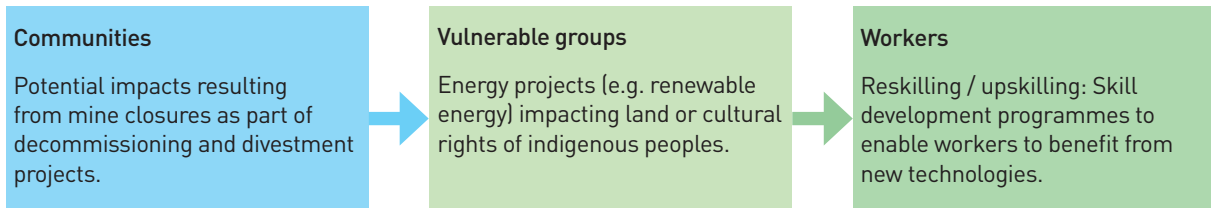
The concept of planetary boundaries identifies nine biophysical processes that together regulate the stability of the planet. The economist Kate Raworth has used these indicators to form the Doughnut Theory. Together, they create a safe and just space for humanity within planetary boundaries (ceiling) and the SDGs (floor). For a business, this underlines the value of simultaneously considering the impacts and dependencies between environmental and socio-economic issues.





Integrating human rights in climate projects

ERM considers that the **Just Transition** concerns moving away from fossil fuels towards a green economy in an equitable and inclusive manner and with respect for human rights. The **Just Transition** is about putting people at the centre of the discussion:



The **Just Transition** is driven by regulatory developments including the EU "Green Deal" and Taxonomy, the EU Directive on Corporate Sustainability Due Diligence, national legislations, increased expectations from investors and public awareness on the link between climate change and human rights.

Beyond that, in the respect of their social responsibility, companies developing or investing in projects or developments that support the energy transition have to ensure that the social and human rights impacts on people are identified and managed accordingly.

Renewable energy companies have a key role to play in the **Just Transition**, while respecting human rights through implementation of human rights due diligence in operations and projects;

Extractive companies increasingly develop **Just Transition** frameworks and conduct assessments for their emission reduction activities, while developing reskilling programmes for employees and contractor workers;

Companies in other sectors develop decarbonisation strategies with human rights components. For example, ERM supported a company in the publishing sector, where a printing supplier was facing modern slavery allegations, by conducting a human rights gap analysis in the supply chain and making recommendations on improving the supplier management system on these issues.

Most importantly, **investors** have to ensure their renewable energy investment decisions do not contribute to adverse human rights impacts. For example, ERM supported a private equity client with supply chain human rights due diligence of solar panel suppliers potentially linked to forced labour as part of a solar energy project acquisition.

The **just transition** refers to support for people, regions and workers that factors in the social and economic implications of emissions reductions. The expression initially emerged via trade union associations in the 2000s and was gradually institutionalised, notably through the United Nations^[21] and recently through the signing in Glasgow of the Just Transition Declaration. In June 2021, Finance for Tomorrow launched the world's first coalition of commitment to a just transition - Investors for a Just Transition - and is working, among others things, to define investment methodologies that take into account the social acceptability of the transition. In late 2021, the United

Nations Global Compact, the International Labour Organization and the International Maritime Organization launched the 'Just Transition Maritime Task Force' to address issues related to jobs and skills development, occupational safety, equity, and diversity in the context of the decarbonisation of shipping. For its part, the World Benchmarking Alliance has developed a preliminary methodology for assessing the just transition, and published an initial benchmark^[22] of corporate performance in the energy (electricity, oil, gas) and automotive sectors ahead of the COP26 in Glasgow.



Empowering individuals for a just transition

La Banque Postale is the first European bank, and one of the first financial institutions worldwide, to have a decarbonation pathway for its financing and investing portfolios validated by the Science Based Targets initiative.

La Banque Postale understands that a sustainable future cannot happen without supporting underfunded and overlooked populations. LBP has therefore outlined that aiding these populations is a key strategy to a successful ecological transition.

In its core mission, LBP pursues and is committed to a sustainable future by its willingness to empower all of its clients to accessible banking and investing in all cities and regions.

La Banque Postale offers an unmatched portfolio of financial services to encourage the ecological transition of all its clients, individual, as well as business and corporations.

Most recently, La Banque Postale launched the commercialisation of "Prêt Avance Rénovation" (Renovation

advance loan), an offer allowing senior citizens, or modest income homeowners, to finance their energy renovation projects. "Pret Avance Renovation" allows borrowers the option to the repay at the moment of sale or inheritance of a property.

This offer is a new solution to fight against the 4.8 million buildings with low energy efficiency rates that contribute to the limit of greenhouse gas emissions.

In addition to the energy consumption reduction, this offer also contributes to the fight against inequalities of wealth due to the of lack financial means for isolation projects and low-income families often dealing with particularly high energy bills.

LBP's innovative "Pret Avance Renovation", combined with its dedication to climate and social sustainability, is the double sided solution to LBP's strategic and mission-led focus from February 2022 and into the future.

21 https://unfccc.int/sites/default/files/resource/Just%20transition_for%20posting.pdf

22 <https://www.worldbenchmarkingalliance.org/research/2021-just-transition-assessment/>

E Transitioning economic activities

Achieving Paris Agreement-compatible GHG emissions reduction levels entails sweeping changes in business. 'Reinvention must become the norm', declares an Accenture report on companies committed to carbon neutrality, estimating that even quadrupling the annual reduction rate would enable only 42% of them to attain their 2050 targets. The path to neutrality requires far-reaching value chain restructuring. According to the WBCSD, the need to take immediate action, undertake large-scale decarbonisation of the economy, and factor in the interconnections, dependencies and contributions to nature and society calls for a new prioritisation of economic activities. Three trends are discernible:

- **the market shares of economic sectors** will change. Those heavily dependent on fossil resources (refining, carbon-based energy producing, etc.) will decrease in volume, if not in value, whereas some like thermal retrofits, renewable energies, new mobility modes and so on will grow strongly;
- **within each sector**, demand will increase significantly for some goods, such as low-carbon materials for construction, electric vehicles for transportation, and products made from recycled materials for industry.

Conversely, demand for high-footprint products is expected to decline (e.g. share of beef in food, single-use plastics, etc.);

- **new markets** for existing products will develop. Some oil-related players are switching their activities to offshore wind or underground CO₂ storage, while energy services continue to expand in the service and industrial sectors, along with process electrification.

To cultivate a global pathway compatible with the Paris Agreement, the activities of some economic sectors will need to be phased out. The support of public authorities will be crucial in this process that requires the timelines and pace of transformation to be defined.

With this in mind, corporate activities are already changing dramatically by decarbonising their processes and products, replacing or eliminating high-emitting activities, and developing new offerings to speed up the decarbonisation of the economy. This creative destruction creates many organisational, technological, marketing and economic challenges (see LVMH and BASF boxes).



Frédéric Dufourt, CEO of Ruinart, at the launch of a vitiforestry pilot project in March 2021 in the heart of the Champagne vineyards.
© Mathieu Bonnevie

LVMH

Two essential levers for reducing GHG emissions: eco-design and transportation

The circular economy is a powerful lever for reducing GHG emissions. By setting a goal of 100% eco-design for its new products by 2030, LVMH is providing itself with the means for an ambitious carbon trajectory, validated by SBTi, the priority of which is clearly mitigation: -50% of GHG emissions for Scopes 1 and 2 by 2026 (base 2019); -55% per unit of value added for Scope 3 by 2030. New innovative, recycled, biosourced, certified and/or regenerative agricultural materials have a very significant potential to avoid GHG emissions: organic cotton reduces the carbon footprint of this material by 8% compared to conventional cotton, and recycled precious wool by 455% compared to virgin wool.

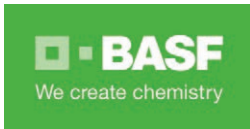
LVMH Houses are inspired by these new materials to create products that combine desirability and environmental excellence. In 2021, Louis Vuitton expanded its range of eco-designed products, now stamped with its logo intertwined with that of the circular economy. Loewe offers a bag made entirely of leather scraps. Fendi led an eco-design process for its iconic bags, Baguette and Peekaboo, which resulted in the House's Zucca pattern woven from recycled polyester and sustainable cotton. Parfums Christian Dior designed an aluminum refill system for Sauvage fragrance that saves 60% in energy consumption, 56% in greenhouse gas production and 35% in water.

Downstream, the circular economy gives a second life to materials or products whose quality is a guarantee of sustainability. LVMH has launched Nona Source, the first online platform that makes high-end fabrics and leathers available to young designers and brands in Europe at competitive prices to encourage creative reuse (more than 60,000 meters of overcycled fabrics). The materials, textiles or leathers, come from the dormant stocks of its Fashion and Leather Goods companies. The repair and patina services developed at Louis Vuitton and Berluti are also intended to be duplicated in several other companies.

Action on transportation is the other essential lever for reducing LVMH's carbon footprint, 94% of which falls within its Scope 3. Hennessy has achieved more than 90% sustainable transportation through the majority use of maritime transport. The company has partnered with Neoline, which will make it possible to send 240 containers a year by sail cargo ship, beginning in 2023. The goal is to move 4 million bottles between Europe and the United States using only the power of the wind. For its part, Celine aims to convert 2,500m³ of air transport per year and has reduced the size and weight of transport packaging by 15% to reduce its impact.



Charlie sneaker made from 90% recycled and biosourced materials with a plant-based plastic sole.



Decarbonisation, a source of innovation in processes and products

As the world's leading chemical company, BASF has ambitious goals on its journey to climate neutrality. Since 1990, the group has reduced its greenhouse gas emissions by 50% while doubling its production. Today, BASF wants to go further by investing €4 billion to reduce its emissions by 25% by 2030 and has set a target of zero net CO₂ emissions worldwide by 2050.

Through its Carbon Management program, and the creation of a working group in charge of transition issues, BASF is pursuing the implementation of innovations for a climate-friendly chemical production. The group is working to decarbonise its activities through the optimisation of production sites (Verbund); the use of biomass, CO₂ or waste as a raw material; the implementation of an R&D program into pioneering low-carbon production processes for basic chemicals. This will enable us to offer our customers products with a lower carbon footprint in the future (Product Carbon Footprint and Sustainable Solution Steering).

Together with SABIC and Linde, BASF is working on the realisation of a pilot furnace for the world's first electrically heated steam cracker, which has the potential to reduce CO₂ emissions of basic chemicals by as much as 90%. BASF is also working with Air Liquide on one of the world's largest cross-border Carbon Capture and Storage (CCS) value chain project in the port of Antwerp, which would avoid the emission of more than one million tons of CO₂ per year. In addition, BASF is developing a methane pyrolysis technology to produce CO₂-free hydrogen. Finally, as the electrification of production goes hand in hand with a decarbonised energy supply, BASF is investing in wind power, notably by building an offshore wind farm with Vattenfall.

F Factoring in uncertainty

In effecting the transition businesses are also having to address strategic, resilience, and risk management challenges. The declining emission curves of scenarios sometimes give a false linear view of the transition. Among the factors of uncertainty are vulnerability to global warming's increasingly physical impacts and the societal risks posed by the transition (technological change, regulation, social acceptance, litigation).

1. Understanding and assessing risks

The IPCC report on the **physical impacts of climate change**, published in February 2022, highlights the growing vulnerability of our societies. Changing climatic conditions lead to the multiplication and exacerbation of extreme events (heat episodes, fires, floods and run-offs, landslides, etc.). These events not only increasingly disrupt economic activities, but also contribute to premature wear and tear of equipment.

Businesses carry out exercises to identify their exposure to risks that may affect operating facilities, supply chains and investment portfolios. These exercises are a real challenge, particularly because multiple factors must be taken into account. Beyond their direct impacts on equipment and personnel, interdependencies are critical. An operational facility may be paralysed if the roads leading to it are inaccessible, or its supplies of raw materials or energy are cut. The high level of technical expertise often required along with the poor availability of forward-looking data on specific geographical sites makes issue resolution more complex. In the South Pole Net Zero report, only 58% of the companies surveyed said they were interested in adaptation issues, 20% had a clear strategy, and 7% had made additional investments.

The 2022 edition of the Global Risks Report by the World Economic Forum sounded the alarm about the risks associated with a **haphazard climate transition**. Based on the twofold observation of the growing impacts of climate change and the lagging pace of the transition, it predicts that the pathways adopted until 2050 will not be coordinated, regardless of what they are. Late transitioning will expose GHG-intensive firms to a loss of competitiveness as a result of rising carbon costs, lower resilience, technological obsolescence, and reduced trading margins. Businesses with international value chains will be particularly exposed to the risks of differentiated policies and regulations disrupting international competition.

The risk of inconsistencies and contradictions between supply and demand, markets and regulations, technological availability and social expectations can make the transition chaotic if they are not anticipated and prevented. Coordinated action by business and government can reduce those risks.

2. Mitigating transition risks

To **reduce uncertainty**, businesses are being forced to explore solutions that enable them to act in the absence of relevant technology or a proper regulatory framework.

Scenario analysis and risk mapping are commonly used tools to assess potential vulnerabilities. Scenario analysis can also identify so-called 'no regret' decarbonisation actions, i.e. actions that appear relevant in a large number of scenarios. For example, investment in energy efficiency and reducing consumption, energy self-production through the installation of photovoltaic panels on the roofs of plants,

or the conclusion of long-term renewable energy purchasing contracts are ways to minimise energy market risks. Similarly, some investments can be avoided if, despite very good returns in one scenario, they are extremely risky in other cases.

In the longer term, when businesses are faced with a highly uncertain horizon, and possible disruptions from within or outside the company, developing a portfolio of solutions is one way to anticipate the future without becoming stuck on a single path.



Making rail infrastructure more climate-resilient

For years SNCF group has worked actively to identify and cut greenhouse gas emissions. But since these emissions linger in the atmosphere, inevitably the effects of climate change will be felt in the short and medium term, which means adaptation is necessary.

SNCF Réseau, the group subsidiary that operates and maintains the French rail network, is already monitoring infrastructure and strengthening its components. It has also launched a resilience initiative to better anticipate climate events and their impact on the long-term, sustainable value of rail assets.

Its priority is diagnosing current and future infrastructure vulnerabilities.

- **Vulnerability of key corridors: the Seine River Valley example**

The Seine Corridor study assessed the physical vulnerability of the Paris–Le Havre rail corridor, focusing on the Seine Valley's climate and regional economies and using the "Climate-related vulnerabilities and risks for transport infrastructures" method developed by CEREMA.

The study assessed the vulnerability of over 400 km of infrastructure, including a dozen systems with 73 components, from track to signalling equipment. All climate risks were covered, based on two climate change scenarios (RCP 4.5 and RCP 8.5) and two time horizons (mid- and end-century).

The results show the areas and causes of vulnerability along the entire corridor, enabling us to identify and prioritise possible solutions and build them into an adaptation strategy.

- **Challenges on the path towards resilience**

Today, SNCF Réseau's focus is the physical vulnerability of the rail network. Over time functional vulnerability must be included to improve the resilience of both the rail system and its surrounding regions. Meanwhile, other studies are assessing the resilience of rolling stock and maintenance facilities.

Any adaptation initiative needs dedicated leadership and structures to raise issues and risk awareness, assemble the necessary skillsets, and more. It must leave room for action by the professions affected by the reality of climate events, while still maintaining a systemwide perspective and close regional ties.

To look beyond climate data, a structure must be created to collect and consolidate the data generated in each area that will enable to qualify and quantify the technical and economic impacts of any event that can be attributed to climate risk.



How to take into account uncertainties in a climate strategy

Saint-Gobain has been engaged since 2019 towards carbon neutrality by 2050. Detailed roadmaps have been elaborated by the business units and will be updated regularly. They rely in particular on the following levers:

- a significant improvement of energy efficiency of processes,
- the possibility to switch to decarbonised energy, being electricity if technically feasible, or decarbonised gas,
- lighter products with increased recycled content.

In most cases, those technical solutions already exist, but are hardly economically viable. For example, it is technically easy to electrify the production of glasswool. In some cases, nevertheless, those technical solutions need to be invented, as for the production of flat glass.

The fact to engage towards carbon neutrality is giving visibility to all our stakeholders. It is indeed possible to make radical changes in 30 years for an industrial group such as Saint-Gobain, as most of assets have a lifetime of 20 to 30 years – for example, a flat glass float furnace is rebuilt every 20 years.

But, the future is uncertain: what will be the energy mix in 2030 in the different countries across the world, with what respective price? How quick will green hydrogen develop? What about Carbon Capture Use or Storage? What will be their competitiveness? With what carbon price? And of course, technological uncertainties remain: a flat glass furnace is operated currently with natural gas. Will it be possible to use 100% electricity, will it be 100% gas or hybrid?

In order to face those uncertainties, Saint-Gobain has made the choice not to rely solely on one scenario, but to work in parallel towards various technological options. For example, the group is studying all 3 options for flat glass (100% electricity, hydrogen or hybrid). In the coming years, it will multiply “proofs of concept” that demonstrate that it is possible to produce zero carbon, provided the relevant decarbonised energy is available. Of course, all this is done while continuing to reduce emissions with “no regrets” solutions, both technically as well as financially, for example by improving our energy efficiency and the usage of recycled raw materials. It is the case for the production of glass with the increases usage of cullet that emits less CO₂ when melted compared to primary raw material.

From ambition to action

A company’s definition of its carbon-neutral strategy extends far beyond climate and energy considerations, and sometimes questions the very core of its economic model. The strategy formulation stage is essential, and the recent momentum toward ‘net zero’ is an encouraging sign.

To realise the net-zero ambition, a full-fledged operational transformation is needed. This is a complex task, as borne out by the CDP survey of 11,000 suppliers in which only 28% had a low-carbon transition plan in place^[23]. Feedback from EpE members on the transition to action is the subject of the next two chapters.

23 CDP Global Supply Chain Report 2021
<https://www.cdp.net/en/research/global-reports/engaging-the-chain>

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2

Transforming corporate organisations

In both private and public companies, the challenges associated with the transformation to carbon neutrality go far beyond strategy definition, and involve the mobilisation of different departments and functions, employee commitment, training, and the integration of new skills.



Figure 7 / Mobilisation of the entire organisation

A Mobilising the entire company

1. Management and governance

The factoring in of climate issues by a company's management relies on three levers: corporate organisation, employee training and pay.

A company's **organisational structure** meets several objectives: identification of indicators for assessing progress made, their adoption in practice by operational departments, and monitoring. Designing roles and responsibilities thus plays a key role. Public disclosure by companies of their governance of climate-related risks and opportunities is one of the chief recommendations of the Task Force on Climate-related Financial Disclosure (TCFD). The appointment of people well versed in climate issues by Holcim to its Executive Committee in 2019, and by EDF to its Board of Directors and Executive Committee in 2020, was therefore an important step in the establishment of climate-related governance. The role of climate

advocate is at times embodied by the Board of Directors, or otherwise appropriated by all the directors. Companies also routinely assign the monitoring and assessment of such issues to both executive and non-executive committees dealing in particular with risks or strategy.

As a result, the climate **competence** of directors and managers is of vital importance. The Climate Governance Initiative of the World Economic Forum (WEF) identifies eight principles aimed at helping directors ensure that they have the right tools to address climate risks and opportunities, including definition of responsibilities, composition of boards, strategic and organisational integration, and establishment of monitoring indicators. To facilitate exchanges between directors, the WEF has launched a network of national associations called Chapter Zero (see box).

Senior executives need a full understanding of the issues involved. BNP Paribas and Saint-Gobain, for example, carry out executive programmes in partnership with the Cambridge Institute for Sustainable Leadership. The Earth on Board initiative aims to inform and guide boards of directors on their responsibilities with regard to environmental issues.

Employee **compensation** is a common tool to ensure that corporate practices are aligned with strategy. According to Chapter Zero France^[24], in late 2021 87% of CAC 40 companies had integrated at least one climate/environmental goal into their short-term or long-term pay policy for executive directors, and 44% into both short- and long-term remuneration. CO₂ emissions reduction is the most

commonly used indicator by companies pursuing climate targets (44%), followed by ESG ratings performance. The weighting of climate criteria in the variable components of remuneration is 9% on average for the long-term and 5% for the short-term variable, i.e. more than half of the variable components for CSR, which accounts for between 5% and 30% of the variable portion, with an average weighting of 14%^[25]. Some companies are gradually expanding this practice beyond just the Chairman or Chief Executive Officer: Schneider Electric, for example, includes criteria from its Planet & Company poll in its incentive scheme for over 10,000 employees.



Climate risks and opportunities: a real challenge for non-executive directors

The Board of Directors is responsible for strategy, risk management and control, as well as the relevance and reliability of the information disclosed.

Climate change creates a complex systemic risk that will impact all fundamentals of a company, including business model and strategy, with increasing intensity. Without any delay, the board of directors must therefore take an active interest.

The scale of transformation required to meet the Paris Agreement is unprecedented and can be difficult to grasp. Yet “climate” is not one of the skills historically required of directors. Integrating it into competences implies both a knowledge evolution and a change in attitude. To meet this challenge Chapter Zero France (CZF) was created in 2020 with the support of Deloitte and the Insead Corporate Governance Centre.

CZF is a not-for-profit and a public interest association. It is a member of the international network of the Climate Governance Initiative, which currently consists of 19 active



Chapters in 30 countries. The purpose is to disseminate the 8 principles of good climate governance set out by the World Economic Forum in January 2019¹.

The objective is to enable non-executive directors to understand the climate issues and provide them with key benchmarks to inform and enlighten their boards. In that respect, CZF provides a range of tools: thematic events, self-assessment and maturity diagnostic, training and trend studies.

Customised events for directors address questions such as:

- What are their legal responsibilities in climate field?
- How to ensure continued access to capital markets?
- How to integrate climate risk?
- What are the drivers of climate-related shareholder activism?

In addition to workshops involving experts and stakeholders (investors, regulators, NGOs, lawyers, scientists, etc.), CZF organises peer to peer meetings: the “Conversation à Huis Clos” (a closed-door conversation) is an opportunity for confidential exchanges that encourage the sharing of experiences.

A community of committed directors is being built in CZF. The association is gradually opening up to executive managers, as collaboration with them is a key success factor.

1 https://www3.weforum.org/docs/WEF_Creating_effective_climate_governance_on_corporate_boards.pdf

24 <http://chapterzero-france.com/wp-content/uploads/2021/11/BarometreRemunerationClimat.pdf>

25 ORSE and PWC, 2017

<https://www.orse.org/nos-travaux/guide-sur-l-integration-de-criteres-rse-dans-la-remuneration-variable-des-dirigeants-et-managers>



Strengthening climate governance

The EDF group is the world's leading producer of electricity with no direct CO₂ emissions¹.

Back in 2018 the group was one of the first to set itself the target of contributing to achieving carbon neutrality by 2050.

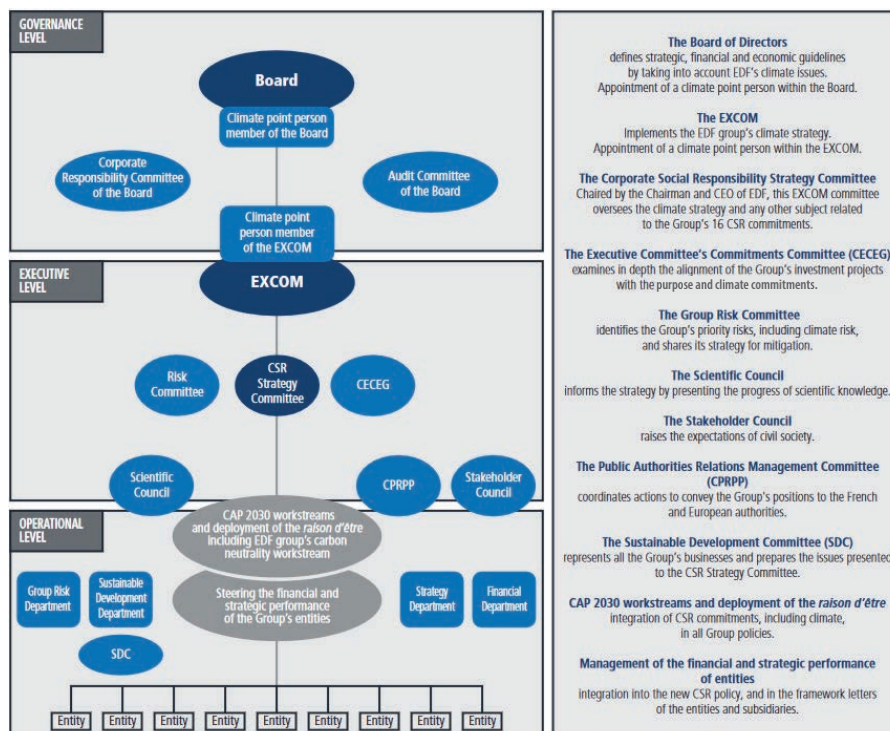
In 2020, the EDF group placed climate at the heart of its purpose: "Building a net zero energy future with electricity and innovative solutions and services, to help save the planet and drive wellbeing and economic development." That same year, the group's commitments regarding its direct and indirect emissions were certified by the Science Based Targets initiative on a "Well below 2 degrees" trajectory.

The group's climate transition plan is based on three main areas: reducing its GHG emissions, adapting its facilities to climate change, and developing the use of low-carbon electricity. These three areas are complemented by a governance component, which was strengthened in 2020 with the appointment of climate coordinators on the group's Board of Directors and Executive Committee. This will enable the plan to be deployed at executive and operational levels, establishing it as a driver of the entire organisation. The transition plan is aligned with the recommendations of the Task Force on Climate-Related Financial Disclosures (TCFD).

To take shareholder dialogue further, the Board of Directors decided to consult the Annual General Meeting in May 2022 on the main lines of the EDF group's climate transition plan. This allowed to explain the strategic choices to the shareholders and to ensure their support. In a similar fashion, the Stakeholder Council has been asked to challenge the group on the 2050 electricity mix scenarios and their externalities.

In addition, the EDF group is implementing actions to enable its employees and managers to take ownership of the group's purpose and of its climate commitments. These actions are mainly articulated around two components: a training component, which includes raising the awareness of 165,000 employees through "The Climate Fresk" workshop, as well as a remuneration component for managers, which consists in the incorporation in their bonuses of a criterion relating to the carbon intensity of energy production.

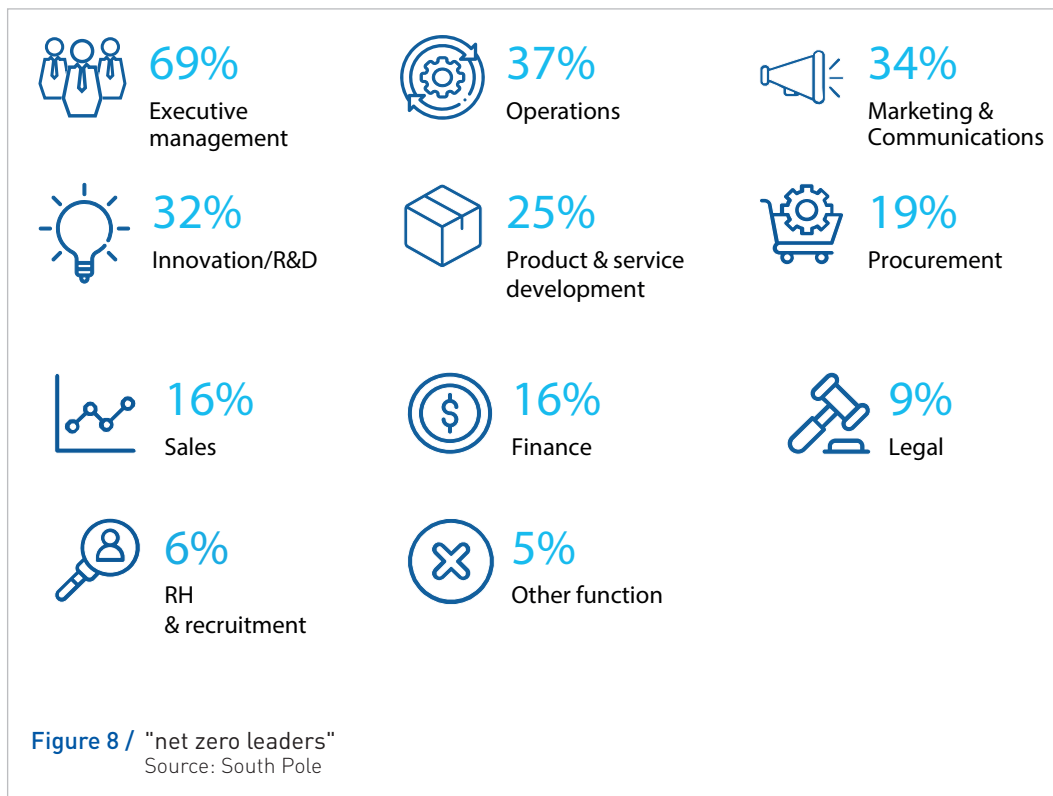
1 <https://power-producers-ranking.enerdata.net>



2. Different corporate functions

The 2000s saw sustainable development departments taking on greater importance within companies, driven mainly by extra-financial reporting obligations. Their role has since expanded substantially. Today, they can be considered watchdogs that detect and warn about changes in a complex landscape, as well as agents of change that create and sustain momentum within the organisation. Indeed, this transformation is increasingly perceived as encompassing all functions of a business. Management controllers and finance departments need to master the specificities of low-carbon and circular economy project financing, engineers have to change the design and very purpose of products and services, sales representatives need to understand the added value of new green offerings and make their customers understand why it is in their interest to switch, buyers have to support suppliers and source the best products, and lastly advertisers must be able to promote them to the various stakeholders.

The South Pole report revealed that management teams are perceived as having a vital role in achieving net zero targets, followed by operations and marketing-communication teams (see Figure 8). This demonstrates the need to strategically direct teams and coordinate different functions, as well as the importance of companies feeling that they are being driven by their markets and developing in harmony with them. The high score of communication could echo the high expectations of consumers and stakeholders, while that of operations reflects the need to visibly improve the energy and climate performance of equipment. By contrast, the low score of human resources shows poor perception of issues related to the development of transition-friendly jobs and skills.



Awareness of and support for all functions should gain greater importance as transformation needs become clearer. Feedback from EpE members shows that good collaboration between functions guarantees efficiency. Gathering information from across the organisation, carrying out joint assessments, identifying and sharing best practices, defining and implementing strategy are

actions which are dependent on the mobilisation of different teams by the functional departments of human resources, sustainable development and communication. For example, Caisse des dépôts assesses the implementation of its responsible investment policy through a team training indicator.

Function	Key issues related to the low carbon transition
Strategy	<ul style="list-style-type: none"> - Assessment of climate risks and opportunities - Development of pathways and transformation of various corporate activities
Sustainable development	<ul style="list-style-type: none"> - Integration of new knowledge - Identification of all types of developments, best practices - Support for other functions - Discussion with stakeholders
Innovation, R&D	<ul style="list-style-type: none"> - Design and development of new products and services - Scaling-up of solutions - Cost reductions for low-carbon solutions
Human Resources	<ul style="list-style-type: none"> - Training-awareness building-employee commitment - Skills identification and development - Attraction-retention of talent required for the transition - Support for transition of activities - Site conversion
Digital/IT	<ul style="list-style-type: none"> - Green IT and environmental footprint - IT for Green decarbonisation solution
Purchasing	<ul style="list-style-type: none"> - Responsible and sustainable sourcing - Supplier commitment - Supply chain resilience
Finance & reporting	<ul style="list-style-type: none"> - Measurement of environmental impact of financial products and services - Investment alignment - Discussion with shareholders and investors - Transition financing
Communication & marketing	<ul style="list-style-type: none"> - Measurement of direct impacts (production-distribution) and indirect impacts (projected lifestyles) - Consumer information, promotion of virtuous product-service labels - Change in ecological transition perceptions - Consistency with product range
Public affairs	<ul style="list-style-type: none"> - Alignment of internal practices - Links with professional associations - Collaboration with public authorities
Legal	<ul style="list-style-type: none"> - Accountability of commitments - Environmental standardisation and norms - Social & environmental law
Operations	<ul style="list-style-type: none"> - Transformation of production tools & processes - Logistics & transportation - Reduction of resources consumption; management of flows to the circular economy - Reduction of non-recovered waste



Drawing on expertise across the company in order to take action

The climate risk is a systemic risk and must be treated as such by companies. Henceforth, one of the challenges with which all organisations are faced involves drawing on expertise across the board and marshalling it around one single aim: tackling climate change.

For Imerys, the first stage was to set a course, establishing climate change as a priority issue within Sustain Agility, its sustainable development approach, embodied and spearheaded by people at the highest level of the company.

For the second stage, an initial multifunctional and multicultural working group was set up in 2018 to select relevant indicators, set ambitious, shared objectives and identify concrete ways to reduce emissions within the framework of Imerys' short-, medium-, and long-term strategy. The strong commitment of all of the group's various departments and business units meant that the company's various areas were all covered – organisational structure, methods, technology, transport and renewable energies, supplies and equipment. The result was that its Scope 1, 2 and 3 emissions reduction targets were approved by the SBTi in 2019.

On the back of this first success, which demonstrated the effectiveness of thinking and working collaboratively, the group – still under the impetus of the Environment department in charge of coordinating the "climate" topic – adopted the same approach in 2020, with an updated analysis of risks and opportunities associated with climate. This second working group brought together all of the company's main functions – environment, sustainable development, marketing, finance, strategy, purchasing, R&D and industrial risks. It spent nine months working on these topics in order to assess the group's exposure to the physical risks generated by climate change, and to analyse the transition opportunities and risks.

In addition to the powerful analysis provided by these differing perspectives, the approach guarantees the involvement of the group's various roles, and their fast and effective distribution and appropriation of the results and the associated action plans.

Imerys will continue to use this inclusive and collaborative approach – an approach made possible by the multidisciplinary working groups that are co-developing, updating and supplementing the group's strategy in the climate transition.



A Climate Fresk workshop undertaken with members of Imerys' Executive Committee
© Imerys



The essential role of cross-functional work to maintain a decarbonisation trajectory

Achieving carbon neutrality objectives by 2050 in a company is a considerable challenge for all structures, whether technical or support. One of the main difficulties lies in the company's ability to mobilise this set of employees, in particular technical ones, whose decision-making chain must allow the development of all the production processes in such a way as to implement a coherent road to decarbonisation.

Typically, at the CNES (Centre National d'Études Spatiales), the main emission sources reside, for Scope 3, in purchases, and for Scope 2 in mission-related travel (manufacture of launchers, but also routing of satellites, travel for teams, etc.), real estate and energy, especially Guyanese consumption (non-interconnected area supplied by fuel oil and by the ultra-emissive Petit Saut dam). These are geographically dispersed teams and departments (establishments, space base, launchers) which have specific expertise and skills, coming from separate budgets and in need of cross-information.

One of the first actions of the sustainable development department was to create a "low carbon" network gathering the key players directly concerned by GHG reduction actions in order to coordinate projects, report implementation difficulties, finance the needs and collect the data. For the company, it is also essential to be able to steer the decarbonisation trajectory as closely as possible by setting

objectives by sector: travel, real estate program, renewable energies including the greening of the space base, etc. The benefit of this network whose principle, deliverables and members are validated by the executive committee, is twofold. On the one hand, the increase in overall skills of all employees on monitoring decarbonisation, its financial tools (certificates of energy saving, mechanism for purchasing electricity by the Energy Regulatory Commission, setting up legal entities, etc.) and its sometimes complex data infrastructures (in particular the lack of interoperability between the platforms declarations put in place by the public authorities). On the other hand, the visibility of the issues through the involvement of the highest level of the organisation. A senior project manager coordinates the network and ensures that the entire decision-making chain is operational.

This organisation has already produced significant operational results. A specific budget unit has been created for receipts from the CEEs (White certificates), making it possible to direct investments towards the low-carbon transition (instead of a return to the general CNES budget of nearly €2 million). Synergies of a large set of energy mix projects for the Kourou space base have been enhanced with a target of 90% renewable energy before 2030 and created a CNES subsidiary dedicated to investment in energy projects, notably fueled by employee savings.

3. Employees: from commitment to skills

Planning skills and job development to ensure that human resources are adapted to corporate transformations is one way of strengthening links between the company and its employees.

85% of jobs in 2030 would not exist today^[26]. People entering the labour market today will change jobs at least 4 or 5 times during their working lives^[27], so it is in the company's interest to anticipate those changes. Most importantly,

close to 80% of employees consider CSR to be an important aspect of corporate life and are keen to take an active part in it^[28]. At a time when the role of business in society and its contribution to the common good are gaining more attention, offering long-term employment opportunities and developing the employability of employees in the context of the ecological transition makes companies more attractive to young people - and to their own teams.

26 Dell Technologies Institute for the future (2017), "the Next era of Human|Machine Partnerships" https://www.delltechnologies.com/content/dam/delltechnologies/assets/perspectives/2030/pdf/SR1940_IFTFforDellTechnologies_Human-Machine_070517_readerhigh-res.pdf

27 <https://www.insee.fr/fr/statistiques/2650453>

28 ekodev (2017), « La RSE vue par les salariés » (CSR seen by employees)

The wide adoption of a corporate vision and the strengthening of employee commitment are actions underlying any transformation programme. Companies want every employee to understand the reasons and content of the green transition so that they develop a coherent and positive vision they can project into and integrate with their daily activities and career prospects. An educational explanation of environmental issues is useful for conveying an insight into their linkages with corporate operations, strategy and sustainability. Disseminating the solutions devised helps to put the changes triggered into perspective. For example, understanding the carbon footprint of jobs allows each employee to visualise their participation in the group's decarbonisation pathway, even in activities to be phased out.

Several EpE companies illustrate this approach:

- The AXA Climate Academy is a training scheme for the insurance company's employees with three modules: understanding the scientific bases of the

climate crisis, the repercussions for the various professions of the group, and a call to action that allows teams to apply the lessons learned to their activity and develop a joint approach.

- EDF, following the publication of its business purpose, has launched a mobilisation programme called 'Fighting CO₂ starts with us', under which all its 165,000 employees participate in The Climate Fresk workshops, and anyone can test their knowledge or calculate their individual or family carbon footprint. On an operational level, employee commitment in favour of the ecological transition is maintained through the regular sharing of actions, of changes in process or energy supply at production sites, and of new commercial offerings.
- Suez has set up a similar program called the Environmental Collage (see box).



TotalEnergies

TotalEnergies is transforming itself into a multi-energy company and affirming its Net Zero 2050 ambition, together with society. To achieve this, internal organisational changes have been implemented:

Creation of OneTech

In 2021, TotalEnergies has brought together 3,400 engineers, scientists and technicians in a single branch to strengthen the capacity for innovation and the skills to design and lead large integrated industrial projects, leveraging the operational excellence of the teams. OneTech thus brings together all the technical skills of the head office, across all energies.

A concrete implementation of Net Zero

The CO₂ fighting squad

Since 2018, a team dedicated to reducing our GHG emissions, the "CO₂ fighters", has been tracking GHG emissions throughout the company. The objective is to stimulate a low-carbon culture, initiate energy efficiency projects, accelerate the electrification of facilities and decarbonise energy consumption. The team has identified and tracked more than 400 GHG emission reduction projects, the majority of which cost less than \$10/tCO₂. By 2025, these projects will reduce Scope 1+2 emissions by 7 MtCO₂/year.

Beyond awareness, **job development assistance** enables employees - because they communicate directly with customers, deal with partners or work on a site with significant environmental issues - to build specific skills. It is often difficult to accurately identify needs and impacts because the appropriate tools and referentials are not yet available. Technical skills are the most relevant, but soft skills are also crucial at times. The ability to collaborate can thus be instrumental in getting information from experts to solve complex problems, or acting in conjunction with other professions, as in the case of successful comprehensive building retrofit projects. Working directly with the professions concerned makes it easier to assess

changes and anticipate training needs. These can sometimes be significant (e.g. energy, environmental services), especially if they constitute the core business of the company. For example, the holding company Vinci supports initiatives to train personnel and to deploy the group's environmental ambition across its entities in a job-specific manner. An environment-dedicated e-learning module is mandatory at Eurovia, a training course on energy performance is available for Vinci Facilities technicians and business managers, and a virtual tour of an airport to grasp environmental issues has been developed for Vinci Airports' new employees.



Tips to make each employee an actor of the group's environmental ambition

By deploying its new environmental ambition since the beginning of the decade, VINCI has kicked off a vast collective mobilisation. In parallel with the action plans implemented in each division, its teams are acting on a daily basis to renew their practices and their offerings, with a creativity that is reflected in the initiatives awarded at the new Environment Awards. VINCI's innovation policy feeds this dynamic.

The operational deployment of the Group's environmental ambition has been stepped up since 2020, in particular thanks to a comprehensive internal mobilisation system symbolised by a visual marker "WE NOW", reminding us that the environment is everyone's business and that the time for action is now. This initiative began with the development and provision of an e-learning for all employees to help them understand VINCI's environmental challenges and ambitions. The launch of an annual environmental day was added to the awareness-raising efforts of employees in the field, in particular through the inclusion of a quarter-hour environmental session in worksite meetings.

The centrepiece of this move to action is a major internal challenge, the Environment Awards, designed to detect, promote and disseminate more widely within the group the environmental initiatives of employees in the field. It has

attracted a high level of participation over more than a year, with:

- 2,548 initiatives reported by employees, all of which being already actions,
- the structuring of a regional network of more than 800 correspondents and experts, who have been trained in the concepts of environmental impact,
- the mobilisation of 57,000 employees, i.e. more than a quarter of the group's workforce, who expressed their views during the voting phases for the initiatives,
- the development of an environmental and economic impact analysis method, applied to each of the 50 finalists.

Nearly 200 initiatives were selected in a first phase organised by territories and major regions of the world, and 14 of them were awarded in the final round on 5th November 2021. Covering low-carbon concrete, renovation and energy efficiency offers, as well as recycling, water reuse and renaturation initiatives, the winning initiatives constitute a full portfolio, that will now be deployed within the group to accelerate the change in scale.



Collaborators, key players in the transformation of the activities

The ambition of the group's Sustainable Development Division is to accelerate the group's employees' skills and competencies in order to be major players in the ESG transformation (environment, social and governance) of the bank and provide the best support to our clients in their transition.

This requires the development of a common transversal CSR culture, appropriate support for banking and insurance businesses and the necessary development of collaborators's skills on sustainable finance.

This ambition is supported through:

→ A large range of training offer enriched every year:

- Digital or face-to-face trainings including 35 E-Learning and MOOCs that can be mandatory or not with certifying courses. It can target specific population as new joiners for example and be accessible to all employees in most locations worldwide. This offer addresses a wide range of generalist but also specialised topics allowing collaborators to follow a real training journey: CSR awareness, environment, energy transition, climate change, biodiversity, sustainable IT, ESG analysis, sustainable investment, etc. The offer was enriched in 2021-2022 with 15 new digital trainings.

As examples:

- a dedicated module on sustainable investment regulations (Taxonomy, SFDR, climate energy law) will be soon released and mandatory to financial market players and financial advisors.
 - an E&S risk module was released in 2021 in 11 languages, mandatory for 40,000 employees (sales, Purchasing and HR functions, management lines, control bodies, etc.) to raise awareness on their roles and responsibilities.
 - Dedicated modules on energy transition were proposed to 10,000 employees (sales teams) to better adapt offers and services and provide support to customers with their business activities.
 - Workshops to raise awareness were deployed: "Climate Fresk", "Biodiversity Fresk" and "Digital Collage".
 - Other workshops were tested: "Ocean Fresk", "Agroforestry Fresk", "2 tons" and "MyCO₂".
- Communication and awareness actions
- A quarterly newsletter on ESG trainings
 - "Challenges" were organised on the CoopAcademy platform (collaborators training platform).



Informing and training employees in low-carbon solutions

Among the four values of the Suez group unveiled in 2019 is passion for the environment. It brings together both the aspirations expressed by employees and the group's historical activities in the management of essential services such as water, waste and air.

In order to disseminate and give concrete expression to this theme among its teams, the group launched the deployment of the Fresque de l'Environnement (Environmental Collage) among all its employees in mid 2020. Designed with the association Climate Fresk, this workshop is a real moment of exchange and consciousness-raising that concludes with a phase of sharing ideas and actions. In addition to building a common understanding of the causes and effects of climate and environmental disruption, and of the low-carbon solutions developed by the company, the workshop aims to create true ambassadors for the environment and the group.

This common base of knowledge is accompanied by specific training to change the practices of certain professions as well as work on Suez's offerings and value propositions. The sales forces are also trained to explain low-carbon offers to customers. At the industrial level, work with operational teams has made it possible to identify and develop critical skills.

Anchoring new practices requires organisational changes when, for example, the line between training and information becomes blurred. In the end, a real transformation program was set up, with the communication, sustainable development and human resources teams working together.



Turning our communication experts into actors for transition

Actively engaged in a positive transformation process for many years, Publicis France has decided to go further by launching in November 2021 an internal program to transform its professions: **We Are Positives (#WAP)**.

The group's ambition: **drive change by developing a more responsible communication for all its activities** (creation, production, media, digital, events, influence, data, technology...).

WAP, is a **compulsory training program** with two phases: **an individual e-learning phase** to gain knowledge of the issues and tools of responsible communication in each area of expertise (challenges, eco-socio-design, eco-socio-production, responsible influence, responsible digital, events and, responsible media) and **a phase of group workshops** to move from theory to practice.

WAP, is also an **innovative project**:

- **in its scope**: it concerns all 26 entities of the group and all 4,500 collaborators in France
- **in its ambition**: to train 70% of French talents by third quarter of 2022, then make it systematic it for all newcomers, and finally to internationalise it
- **in its organisation**: supported by the executive committee of Publicis France, it was created and implemented by the CSR team, the HR, and MySezame, the partner training organisation.

To carry out this project successfully, a whole ecosystem was created around WAP with a dedicated WAP Team to provide support and pilot, "CSR champions" within each entity to relay and motivate, not forgetting the CEOs and managers to sponsor and engage all their employees. A tailored communication plan, with regular highlights, was created to accompany the project.

More than just a training program, it is also a **real community of "Positives"** that is coming to life with a growing enthusiasm and new initiatives emerging and enriching other tools already in place (Positive Media Project, Charter for a better representation of diversity in communication...).

And the impact extends beyond the company, as Publicis has included this blended learning course in responsible communication **in its offerings to its clients**. The #WAP program was awarded the "Grand Prix Stratégies de la Communication d'Engagement 2022".

B Monitoring pathways to carbon neutrality

1. Measuring transformation and the role of data

Measurement is one of the key components of low-carbon business transformation, because measuring is monitoring. The tonnes of carbon equivalent (TCO₂eq) metric is of course the leading indicator, but it is not always easy to get this information. Moreover, measuring business transformation also means tracking more-complex-to-quantify resource indicators (for example, how do we assess the impact of a lobbying activity, whether it accelerates or slows the pace of transformation?). Performance indicators are also of interest. Some companies, for instance, track the ratio of sales to CO₂ emissions to measure decoupling between the two. Others monitor the decarbonisation of their activities through physical ratios (kgCO₂eq/tonne of product or per kWh) that supplement the monitoring of total emission volumes. Depending on the target pursued

or the user, companies use different indicators (see the publication Circular Economy Indicators for Business^[29], in which the lessons learned are largely transferable).

At the operational level, **emissions measurement** is essential. Companies distinguish emissions from their own organisation calculated in terms of direct and indirect emissions (Scopes 1, 2, and upstream 3, BEGES method, or GHG protocol) from those of products and services (downstream Scope 3), calculated using life cycle analysis (LCA). Each approach is framed by various standards and regulations with different objectives: initial diagnosis, decision support, methodology standardisation, consumer and customer information.

29 <http://www.epe-asso.org/les-indicateurs-de-leconomie-circulaire-pour-les-entreprises-octobre-2018/>

When repeated and aggregated by category (countries, activities, etc.), measurements can be used to track the progress of a company's emission reduction plans in relation to the defined pathway. Composite indicators are

commonly used to monitor and evaluate the **transformation levels achieved**, to compare standards or indices, or simply to disseminate facts and figures for the purposes of communication.



BNP PARIBAS

Aligning its loan portfolio towards a carbon neutrality objective by 2050

In order to meet its ambition to align its climate commitments with the target of the Paris Agreement and to pursue a global warming objective limited to 1.5°C, BNP Paribas joined the UNEP-FI's Net Zero Banking Alliance (NZBA), since its launch on April 21, 2021.

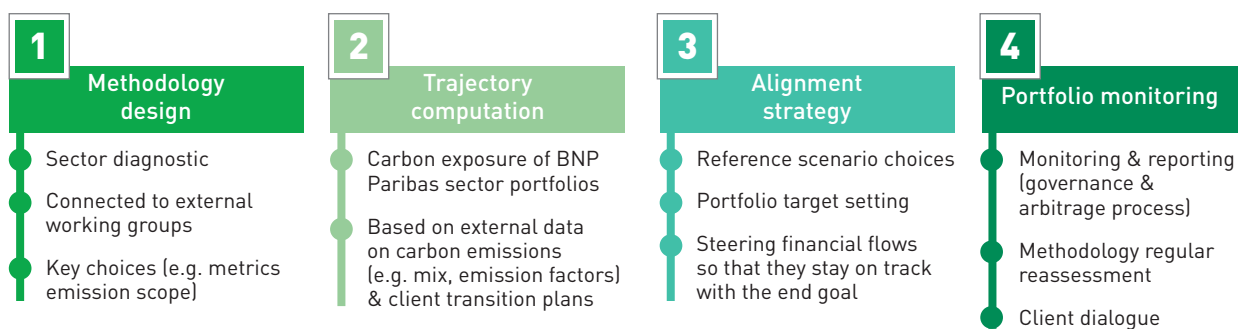
In this context, BNP Paribas has committed to:

- Align the greenhouse gas emissions induced by its credit activities as well as investment for own accounts with the pathway required to achieve carbon neutrality by 2050;
- Rely on credible transition scenarios published by recognised bodies (IPCC, IEA);
- Prioritise its efforts on the sectors with the highest emissions and playing a key role in the transition to a carbon-neutral economy;
- Set intermediary sectoral objectives, by 2030 at the latest;
- Publish its progress and associated action plans annually.

In order to be transparent about its intermediary objectives and the actions implemented, the group published its first Climate Alignment Report in May 2022, covering three of the sectors with the highest GHG emissions globally: power generation, oil and gas, and automotive. The methodology was developed to ensure transparency and comparability taking into account the evolution of the business mix of its customers in the context of energy transition. The group is committed to developing this methodology over time, in collaboration with the banking sector.

Based on the PACTA (Paris Agreement Capital Transition Assessment) initiative, BNP Paribas has built a four-step approach, based on several general principles adapted to the specificities of each sector.

BNP Paribas 4 step-approach at sector level



Thanks to this approach, quantified objectives for 2025 have been defined for each of the three sectors considered, which enables to ensure that for each sector, the BNP Paribas portfolio is aligned with a pathway compatible with carbon neutrality by 2050. BNP Paribas is currently

extending and adapting this work to other sectors depending on their carbon intensity, their weight in its portfolio, their current emissions reduction potential and the availability of precise data.

For example, the rating received upon submitting the CDP questionnaire is sometimes used in performance assessment. It can be included in executive remuneration criteria, since it is also widely used by the financial sector to guide financing and investment decisions.

The ACT® (Assessing low-Carbon Transition) initiative, launched in 2015, stems from cooperative work between COP and ADEME and allows corporate climate strategies to be assessed against the Paris Agreement. ACT tackles the issue of 'accountability' and provides methods to assess the alignment of a company's strategy with a decarbonisation pathway that is adapted to its activities in relation to its sector. The assessment consists of three sections: nine performance indicators, four corporate 'narrative' analysis criteria, and a trend ranking to evaluate the company's decarbonisation momentum. This method draws on qualitative and quantitative studies and, as such, can be used to assess, facilitate and develop decarbonisation strategies. In early 2022, nine sectoral methodologies were available and seven are being finalised. More than 400 companies have been involved in methodological developments or used the initiative.

Data availability is of particular importance in monitoring decarbonisation. Companies can now easily obtain information to estimate emissions directly related to their operations (Scopes 1 and 2), at least in Europe. To measure emissions from purchased energy, companies can take a

'market-based' approach which reflects the carbon intensity of the mix actually purchased. That, however, requires detailed reporting of consumption as well as knowledge of mix intensity, unlike the easier-to-use 'location-based' approach which uses the average grid mix, but does not allow the value of sourcing changes to be calculated. Collecting accurate information and data on supplies (upstream Scope 3) often from numerous suppliers can be extremely complex. Emissions from the transport, distribution, use, and end-of-life of products (downstream Scope 3) almost always have to be estimated with models using normative assumptions that seek to best describe the often diverse and complex-to-model usage behaviour of customers and consumers. The use of a monetary ratio (kgCO₂eq/€) allows for an initial estimate of emissions from purchases, but is not perfect. An increase in purchasing expenditure mechanically leads to an increase in estimated emissions, even if the extra cost stems from the purchase of decarbonised products.

However, **data quality** is critical to effective monitoring. Data that is too generic (e.g. national, sectoral or product group averages) may ultimately reduce the relevance of measurement results because it is indiscriminate or indiscriminating and does not track the effects of GHG emissions reduction plans. For example, to compare the extra-financial performance of companies, projects, or the debt companies finance or invest in, financial players need data obtained on a like-for-like basis.



TotalEnergies

Methane emissions detection and quantification: AUSEA drones

In 2021, the IPCC estimated the impact of methane on current warming at 0.5°C compared with the pre-industrial era. TotalEnergies halved methane emissions at its operated sites between 2010 and 2020 and has set new targets for the next decade: -50% by 2025 and -80% by 2030 compared to 2020. TotalEnergies is a pioneer in the detection and quantification of methane emissions. The deployment of AUSEA¹ drones - a technology developed in-house with

the collaboration of the CNRS to measure plume concentrations by going back to the source - has demonstrated accuracy that is superior to all available commercial technologies and is being successfully deployed.

¹ Airborn Ultralight Spectrometer for Environmental Application

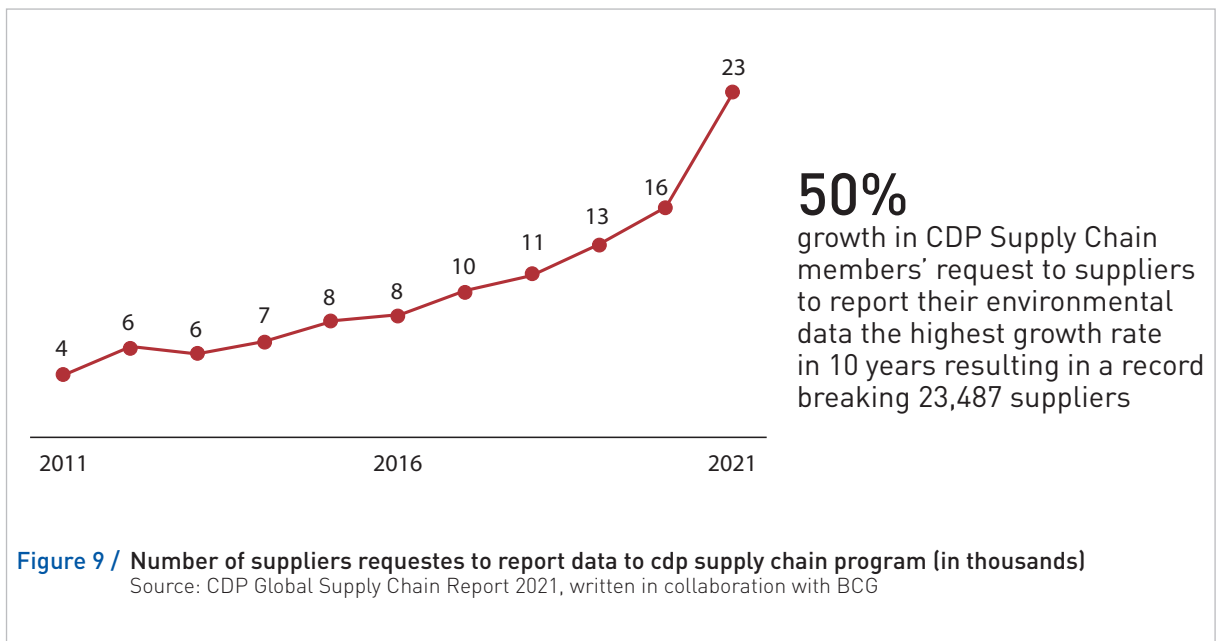
This involves the use of standardised methodologies based on identical analytical assumptions and emission factors, irrespective of the assessed entity. As demonstrated by a Louis Bachelier Institute^[30] study on the methodologies for aligning financial portfolios with climate pathways, variances in results among different existing methodologies are common and sometimes very significant. For investment portfolios, aggregation can be complex because it involves allocating emissions among players to avoid double counting. For example, the Scope 3 of one company can be the Scope 1 of another in the same portfolio.

Financial players occupy centre stage in the climate data revolution. Risk analysis is becoming increasingly complicated. In the past, banks managed old, known risks, centred mostly on solvency. Today, they have to manage new risks that are more difficult to assess. As well as aggregating data from their customers and from the projects into which they invest in all their complexities, banks must integrate the measurement of their own performance. Since COP21, the finance profession has advanced considerably, further bolstered by recent regulatory developments (taxonomy, reporting obligation).

The requirements for climate **data management** are growing. As data volumes increase exponentially (product databases, life cycle data, dynamic assessment, supplier

data, etc.), and demands for greater reliability (third-party verification, etc.) and confidentiality continue to grow, some site-specific emissions data can enable normally confidential production information to be reconstructed, thereby posing a potential problem. This promotes strong professionalisation in companies and among their providers, including the establishment of collection and verification processes, data governance, and the automation of data collection, processing, and even sharing and use.

The professionalisation of climate data management is being accompanied by the development of new **technical solutions**, in the same way as software packages in their time. The capabilities of these tools reflect the multiple needs of businesses, including the measurement and in-depth understanding of carbon footprints to identify areas for improvement, pathway simulations, roadmap definition and tracking, investment and performance calculations, sharing-collaboration-exchange with suppliers and customers, and dynamic data tracking over the entire lifecycle. Examples include the French start-up Sweep, the Ellipse tool developed by Engie, and CO₂-AI, a collaboration between CDP and BCG Gamma.



30 <https://www.louisbachelier.org/wp-content/uploads/2020/10/cookbook.pdf>



Measuring the "temperature" of investment portfolios

With €1051bn under management at the end of 2021, AXA is a leading global investor. In 2019, AXA announced its goal to aim to align its investments with the Paris Agreement, reducing its "warming potential" to +1.5°C by 2050.

To work towards this goal, AXA uses a model derived from Carbon Delta MSCI to calculate the "Warming Potential" of its investments. This metric aims to provide a comparison with a benchmark showing how well current markets are aligned with the Paris Agreement goals and allowing AXA to benchmark itself against the markets. While methodological challenges remain, it is a relevant contribution to collective efforts.

AXA's analysis for 2021 revealed a "warming potential" of 2.7°C, which is below the market benchmark of 3.2°C. This analysis shows that investors remain strongly committed to a global economy far removed from Paris Agreement-compatible trajectories and that AXA's actions on asset allocation and current issuer selection are having a positive effect. Nevertheless, alignment with 1.5°C is still to be built.

The fight against climate change requires a vast transition effort that investors cannot achieve alone. All sectors and companies have a responsibility to evolve by taking into account social and business impacts. And it is up to investors to identify the challenges and support the transformation, for example through divestment from carbon-intensive industries, climate-related shareholder engagement, and investment in green assets.

The more collectively we develop and use measurement and action frameworks, the more relevant they will be. AXA is actively working with members of the Glasgow Financial Alliance for Net Zero (GFANZ) to support a collective program and to track and report on its progress and that of the market towards the 1.5°C target. AXA is also contributing to efforts to develop robust measurement methodologies by working with the Net-Zero Asset Owner Alliance (NZAOA) and the Task Force on Climate Related Financial Disclosures (TCFD).

2. Planning and monitoring decarbonisation

Private players are increasingly using **planning tools** to simulate or define their decarbonisation roadmap. Simulating GHG emissions reduction pathways is common practice, allowing companies to identify which levers can be used, and to assess and compare their reduction potential on the basis of various parameters (deployment period, types of technology, site or country specificities, reduction costs, etc.). Simulations are sometimes used in exploratory approaches as well. In addition to strategic exercises, these tools can be used by different corporate professions and activities for the development of reduction pathways and deployment of related action plans.

Roadmap tracking is also a key element of corporate carbon pathway monitoring systems. Here, too, scenario building can be used to forecast potential emissions based on different business development prospects, and thus to track the entity's or company's carbon budget, and the pathway's consistency with targets.

Energy pathways to carbon neutrality in 2050

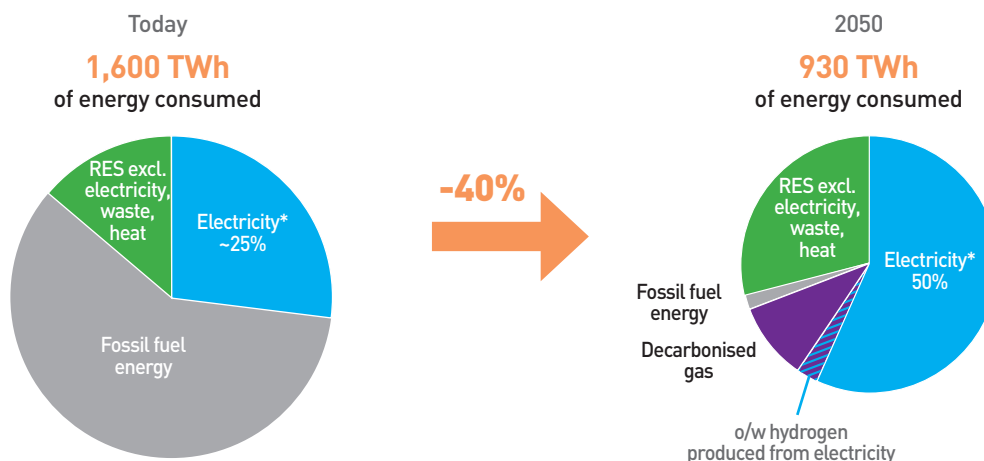
RTE published in October 2021 and February 2022 a large study on the evolution of the electricity system entitled "Energy Pathways to 2050". Based on extensive simulation work, its objective was to describe and study different scenarios for achieving carbon neutrality in 2050, and to specify their technical, economic, environmental and societal impacts. The study's key findings are as follows:

- Reducing consumption through energy efficiency, and possibly energy sufficiency, is key to reaching climate targets.
- Energy consumption will decrease but demand for electricity will increase as it replaces fossil fuels.
- Accelerating France's reindustrialisation by electrifying processes will increase its electricity consumption but reduce its carbon footprint.
- Starting now, the transformation of the power system must take into account the likely consequences of climate change.
- Renewable energy development raises concerns about the use of land and the limitation of other uses. Its growth should be able to accelerate without

putting excessive pressure on soil artificialisation, though care must be taken to preserve living environments in each region.

- Even when factoring in the full carbon footprint of infrastructure over its entire lifecycle, electricity in France will remain largely decarbonised and will make a significant contribution to carbon neutrality by replacing fossil fuel energy.
- There may be tension around mineral resource supply in the energy transition economy, particularly for certain metals, and it will be necessary to plan accordingly.
- By 2050 it will be possible for France to develop a power system adapted to carbon neutrality while keeping costs under control.
- Whatever the scenario considered, action cannot be delayed.

[Energy pathways 2050 Key results.pdf](#) (rte-france.com)



* Final electricity consumption (excluding losses, excluding consumption related to the energy sector and excl. consumption for hydrogen production)
Total electricity consumption in RTE's baseline trajectory = 645 TWh

3. Improving decision making

When **making decisions**, other tools can be leveraged. For several years now, in particular since COP21, many private stakeholders have set an **internal carbon price**. CDP^[31] data shows that 5,900 of the world's largest companies were using an internal price in 2020. This tool can take different forms (internal tax with real financial flows between entities, shadow price, etc.) and serve different objectives, starting with a reduction in the risk of investing in assets that will lose their profitability in the event of a carbon tax, and followed by encouragement for low-carbon investments, energy efficiency and changes in internal behaviour. Sometimes, it can be used for anticipating regulatory developments or performing stress tests. The use of internal pricing tools continues to reflect a willingness to anticipate a low-carbon future. In 2016, EpE in partnership with I4CE published a ground-breaking report on corporate practices that is still highly topical^[32]. Skyrocketing European carbon quota trading prices (EU ETS) in 2021 have reinforced this trend, with CDP noting a 80% increase in the number of companies using this tool.

The shadow price is the most common application in decision-making processes. It involves applying a virtual cost to every tonne of carbon generated in the economic calculations of projects and investments. Applied in the context of R&D, it helps to ensure that the solutions developed will be compatible with a low carbon future. While the median value of shadow prices is US\$28, it is not uncommon for the price to exceed the US\$100-mark, especially when the time horizon in question is long term.

Internal carbon pricing, however, does not resolve all the issues and can be supplemented by other tools or criteria (technical feasibility, anticipated regulatory developments, and requisite human skills).

Regardless, various planning or decision-making tools are powerful means of onboarding teams, expressing choices, and engaging in individual or collective discussions. The main advantage of internal carbon pricing seen by companies is that it creates and promotes dialogue between corporate development, investment and operational teams.



Integrating CO₂ into management processes

The reduction of the group's GHG emissions is closely followed by all its stakeholders and investors. The group's climate trajectory to 2030 was validated by SBTi in February 2020. To ensure that the 2030 objectives are met, a robust governance system has been put in place, based on the adaptation of numerous processes.

First of all, in order to finely control the emissions trajectory, emissions are projected each year until 2030, in line with all the group's medium-term financial assumptions. This makes it possible to correct any deviations from the 2025 and 2030 targets. These forecasts are also used to define carbon budgets for year N+1 for each of the Group's businesses. Compliance with these budgets is then challenged four times a year at the highest level of the company, during internal Quarterly Business Reviews. A dedicated steering committee has been set up within the group, and is responsible for proposing arbitration decisions to the Executive Committee.

To ensure that each new investment is compatible with ENGIE climate trajectory, the monitoring tool is the "flex CO₂": the overall CO₂ budget available per year until 2030 to respect the trajectory defined for the group. The carbon footprints of all new projects are therefore analysed in relation to this flex CO₂, which is updated every month.

In addition, ENGIE's Board of Directors closely monitors this major commitment via the Ethics, Environment and Sustainable Development Committee, which regularly discusses the climate issue and verifies, among other things, the relevance of the actions implemented to steer the emissions reduction trajectory and control climate-related risks.

31 <https://www.cdp.net/en/climate/carbon-pricing>

32 <http://www.epe-asso.org/prix-interne-du-carbone-septembre-2016>



Integrating CO₂ performance into management and investment processes

The steering of the climate strategy towards carbon neutrality and the achievement of intermediate objectives - stabilisation of emissions by 2025 and a 33% reduction in 2035 compared to a 2020 base - is carried out at several levels.

The deployment of this strategy is closely monitored by the group's Board of Directors, in particular through the Environment and Society Committee, in place since 2017, and dedicated to CSR topics, which meets at least three times a year. It also holds a joint session with the Audit Committee for the review of risks, which include transition and physical risks.

In addition, the management and investment processes have been updated to fully integrate CO₂ performance at the same level as financial performance. For example, the budgeting process now includes the allocation of a carbon budget to the different geographical areas in line with the group's anticipated trajectory, as well as quarterly monitoring by geography and business line at Executive Committee level.

As part of the investment process, an analysis of the impact of any new project on the CO₂ trajectory, both upwards and downwards, as well as, for high-impact

projects, is conducted by a dedicated committee supporting the Investment Committee, in order to analyse emission reduction options in detail. The financial analysis includes a carbon price, with a reference price of €50/tCO₂, the local price where applicable (existence of a tax or quota market), and a high value of at least €100/t chosen according to the geography and context.

At the operational level, in each country group (cluster), Climate Champions are responsible for driving the CO₂ reduction targets: as the focal point of contact for the Sustainable Development Department, they coordinate the development of a roadmap defining all the operational measures required to achieve the climate targets. The roadmaps are then consolidated at group level.

More generally, the climate objectives are taken into account in all the group's processes: purchasing, innovation, new offers, energy supply, financing, etc. All of the group's major functions have thus changed their processes and methods in order to contribute to achieving Air Liquide's climate objectives.



IMERYS

Setting an internal carbon price to drive investment

The Task Force on Climate-Related Financial Disclosures (TCFD) defines the internal carbon price as an "internally developed estimated cost of carbon emissions". This can be used to guide decision-making processes in order to identify revenue opportunities and risks, as an incentive to drive energy efficiencies and reduce costs, and to guide capital investment decisions". The internal carbon price should not be seen as a lever for factoring in climate change, but should instead be seen as an element facilitating the implementation of projects aligned with a given low-carbon strategy.

Since 2020, Imerys has set a shadow price for carbon as part of its commitment to tackling climate change. The aim was to define a value voluntarily set by the company in order to quantify the economic risk of its greenhouse gas emissions and to establish it as a criterion in project decisions.

This shadow price is applicable to:

- all projects to do with a change in energy or energy efficiency;

- all projects worth more than €150,000 which have an impact on CO₂ emissions to the tune of +/- 1000 t.

This price is integrated into project profitability analyses and is used to highlight the risks or capital gains associated with them, and to guide investment decisions towards the most virtuous projects.

Very well received across the company, it has demonstrated its relevance and utility on several projects, and has another virtue. By requiring that the associated emissions be calculated for each project, it encourages the upskilling of teams in this area, and establishes CO₂ at the heart of decision-making processes.

Having initially set the price at €50/tCO₂, the Group's Executive Committee decided to re-evaluate the shadow price in 2022. It set it to €80/t so as to integrate the fast-changing international situation (in particular, the significant increase in the price of quotas on the European market), and to emphasise the group's growing desire to reduce its emissions.

4. Supporting industrial and professional changes

Decarbonising the economy requires putting a price on a resource that was once free. That price can either be explicit (through taxation) or implicit (through regulation, or technical standards), but both have a similar effect of triggering quicker obsolescence of existing 'fossil' assets³³. The causes of the sudden appearance of 'stranded assets' are potentially numerous. They can be physical or societal, such as carbon taxation, changes in demand, lower costs of competing clean technologies and vice versa, disinvestment, etc³⁴. For the energy sector alone, the total amount of potentially affected assets by 2050 has been estimated at US\$2.1 trillion³⁵. The risk is significant because the life

or depreciation of such assets is long and they include everything from industrial equipment and installations to patents, skills, work processes, and even products. Businesses planning the transition require adequate financial, human, and technical resources in the right place at the right time, in order to be able to dispense with these assets. The problem of asset write-offs on balance sheets looms for all companies, who are tempted to wait until the assets are already depreciated before writing them off. Monitoring their compatibility with carbon neutrality pathways is a tricky exercise.



Converting and decarbonising high-emissions assets

In 2017, Veolia's coal-using business activities accounted for 2.9% of its revenue and 31% of direct emissions under its operational control. Veolia therefore decided to take a position on the production of heat and electricity from coal.

In 2018, the Board of Directors set Veolia on the path toward phasing out thermal coal. Veolia consequently undertook not to acquire or expand any businesses that use coal, unless specifically to replace coal with energies with lower greenhouse gas emissions. Rather than to pass the buck by selling them, the group immediately began to convert these existing businesses in order to eliminate coal and its impact on emissions entirely in the long term. This combines two levers: improved energy performance through efficiency solutions for manufacturing and energy networks; and coal substitution, either through alternative fuels (waste, biomass, gas) or by harnessing residual heat

As part of its Impact 2020–2023 strategic plan, Veolia set itself a target progress rate of 30% for investments in converting European coal-fired power plants by 2030 on all sites where Veolia controls investment. This target represents almost €400 million of the group's estimated total investment of €1.2 billion between 2019 and 2030.

In 2021, Veolia accelerated its investment cycle, particularly in Germany, where investments will be completed by the end of 2022, and in Poland, where the Group is supporting the country's energy transition ambitions through the recently established capacity market.

33 Jean Pisani-Ferry, 2021

<https://www.pfie.com/publications/policy-briefs/climate-policy-macroeconomic-policy-and-implications-will-be-significant>

34 https://assets.lloyds.com/assets/pdf-stranded-assets/1/pdf_stranded-assets.pdf

35 McKinsey, the net-zero transition report

<https://www.mckinsey.com/business-functions/sustainability/our-insights/the-net-zero-transition-what-it-would-cost-what-it-could-bring>

The example of the automotive industry is particularly illuminating. The gradual tightening of regulations has led to plans requiring all vehicles sold in France to be 'zero-emission' by 2040, even perhaps by 2035 (UK and European Commission proposals). As a result, the automotive industry is investing heavily in new engines, slowing down or stopping ICE-vehicle production, and re-engineering a significant proportion of its industrial activities.

It is possible to **identify stranded assets** by performing 'stress tests' and foresight exercises that take into account different development scenarios. This is one of the objectives of the TCFD recommendations. Identification also enables actions to be implemented with the aim of reducing the risk of stranded assets emerging, for example through investments in energy performance and housing retrofits. In the last resort, there is the question of what to do about their end of life and whether it would be better to resell or transform assets considered to be at risk. Resale, if it allows the seller to reduce emissions, raises the issue of

length of operation under the new owners, and of the pressure exercised on them to reduce their own emissions.

Investors are particularly attentive to these risks, their identification and assessment, and the reporting procedures in place. The actions available to deal with the situation can range from portfolio screening to partial or total divestment and include corporate governance commitment.

By contrast, gradual changes across supply chains involving the deployment of new models requires not only large amounts of capital and adequate technical capacity, but also broad coordination among players to avoid **bottlenecks** caused by rising demand outstripping supply. The Varin report submitted to the French government in January 2022 made recommendations aimed in particular at securing the supply of mineral raw materials, battery metals (nickel, cobalt, lithium) and permanent magnets (rare earths), particularly critical for electromobility and new energies.

Renault Group

Flins-Reconversion, training and support of teams

Against a backdrop of profound transformation in the automotive sector, marked in particular by the switch from internal combustion engines to electric vehicles, Renault Group has launched the Refactory project, transforming the Flins site over the past two years into the first European plant dedicated to the circular economy of mobility. The ambition is to fully integrate the transformation of skills in order to maintain the workforce at the site, which will stop producing new vehicles by 2024. By the end of 2021, 700 Flins employees had already joined the Refactory's activities. By 2030, the site plans to employ more than 3,000 people.

All employees are covered by a common core of training courses on the principles of circularity, sustainability and recycling of materials, and energy storage. It is completed by aspects specific to the four divisions:

- a retrofit activity (in particular to convert commercial vehicles to electric), maintenance and reconditioning, which transforms the jobs of technicians but also of logisticians. During the first 80 days of operation, 1,500 vehicles were put back on the market, a figure that could reach 45,000 by 2023, the equivalent of 12% of vehicles sold in France in 2021¹, with the possibility of doubling this figure in the medium term.

- a battery repair activity (20,000 per year by 2030) and their reuse in positive stationary and mobile energy storage (for a capacity equivalent to 575 new Renault ZOE batteries in 2022, i.e. 750 Renault ZOE batteries in 2022²). To this end, the teams will receive training in repair diagnostics, remote maintenance and electrical accreditation.
- a recycling activity for mechanical parts and, in the long term, electronic parts, for which skills in deconstruction, dismantling, electromechanical and mechatronic techniques have been developed in-house.
- innovation and training, particularly for employees undergoing retraining or whose jobs are changing. The topics covered range from soft skills such as collaboration and responsible decision-making to technical aspects.

1 <https://www.renaultgroup.com/finance/informations-financieres/chiffre-cles/ventes-mensuelles>
 2 <https://www.mobilize.com/mobilize-pour-les-entreprises/solutions-de-recharge-pratiques>



Inclusive projects for a just transition

Convinced that the transition to a carbon-neutral economy is only possible if its social impacts are taken into account, ENGIE integrates the principles of a just transition into its projects and applies them to all its stakeholders: employees, neighbouring communities, consumers, etc.

ENGIE has therefore signed a global agreement¹ with the global trade union federations and the French trade union organisations representing the group on fundamental social rights and social responsibility at ENGIE. This agreement provides a common base of guarantees for all ENGIE employees worldwide and reflects the importance the group gives to its social responsibility.

In addition, ENGIE was able to demonstrate its commitment to a just transition during the first closures of its coal-fired power plants. These experiences offer valuable lessons on how to restructure the regional economic fabric for a more prosperous and healthy future: worker trainings and redeployment programs, site rehabilitation projects co-constructed with local communities, social contributions through partnerships, inclusion of all stakeholders...

In Chile, for example, ENGIE has launched a program to close its five coal-fired power plants (800 MW in total) and replace them with 1,000 MW of renewable electricity projects, in collaboration with all stakeholders: government, communities, unions, local authorities, workers (33 direct employees relocated), and customer contractors.

ENGIE intends to develop new industrial sectors that have positive spin-offs for the territories and contribute to their resilience, thanks to a robust stakeholder consultation process and the conclusion of partnerships. In this respect, the inauguration of the Marcoussis solar farm is a great success that embodies the notion of a regional project as ENGIE conceives it, in perfect collaboration with local partners and elected officials. The use of participatory financing has helped to anchor this project in the region and has enabled local residents to become involved in the energy transition.

Finally, for consumers, the principles of a fair transition are based on initiatives in favour of affordable energy. Thus, ENGIE proposes free offers - or those requiring only a few euros - allowing consumers to monitor their consumption, to benefit from personalised advice, to manage according to a target budget or to control their consumption and comfort remotely.

1 ["A modern and comprehensive social agreement" \(engie.com\)](https://www.engie.com/en/actualites/actualites/2022/01/2022-01-10-a-modern-and-comprehensive-social-agreement)



The supply of mineral raw materials, metals for batteries (nickel, cobalt, lithium) and permanent magnets (rare earths) is particularly critical for electromobility and new energies. Phalaborwa Mines, South Africa © 2013 Astrium Services

From the individual to the collective

The effective implementation of a carbon neutrality strategy in companies concerns all levels of their organisation, including their various professions, functions and processes. Many previous examples illustrate the existence of tools and practices to factor decarbonisation into all corporate management processes, including definition of operational and strategic monitoring indicators, organisation of teams and corporate governance, annual and multi-year carbon budgets, and CO₂ pricing in investment decisions.

As profound and necessary as these changes are, their mere implementation would not guarantee a successful pathway to a world in which warming is limited to 1.5°C. Companies are therefore engaged in more collective approaches beyond the activities over which they exercise direct control.

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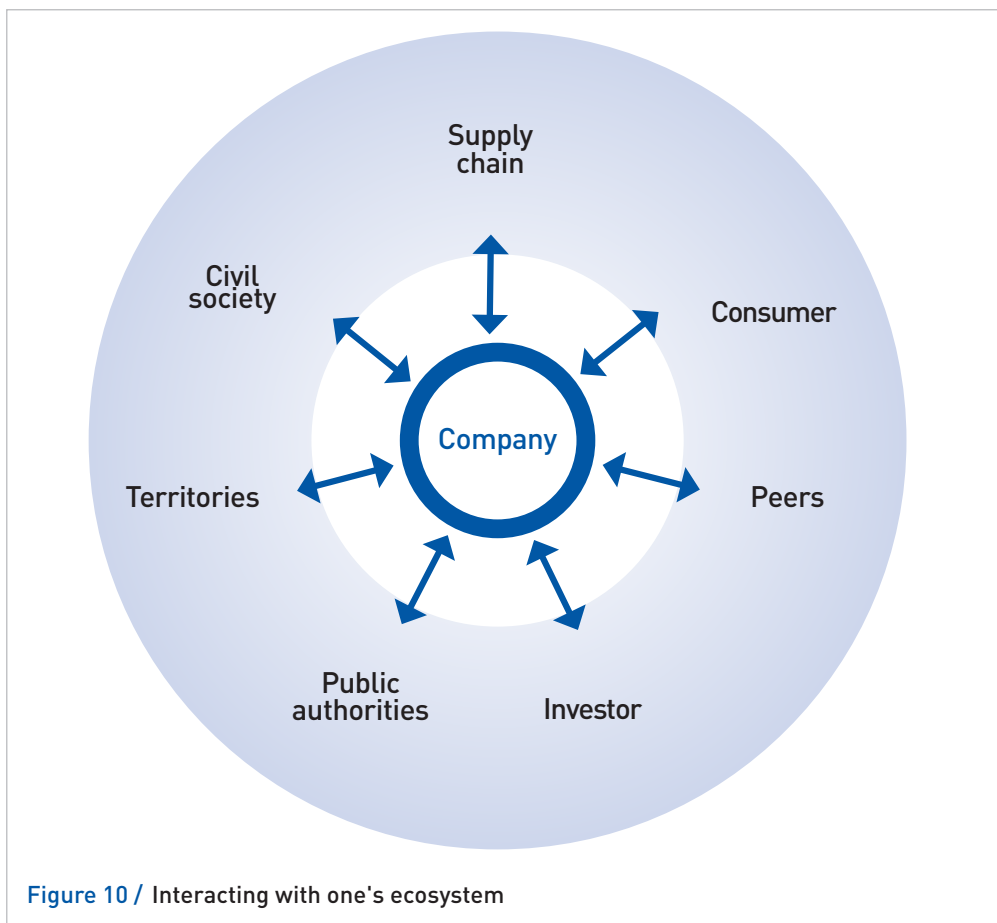
3

Interacting with one's ecosystem

Many challenges have become too complex and systemic for an organisation to tackle them alone, even for a large international group. This observation is shared and illustrated by the 17th and final UN Sustainable Development Goal 'Partnerships for the Goals'.

The collective dimension lies at the very heart of the concept of carbon neutrality, defined as a common goal. Acting for carbon neutrality, therefore, requires companies not only to help decarbonise activities over which they have only limited influence, such as those of their supply chains or related to the use of their products and services, but also to bring about the transformation of sectors, markets, territories and even national energy mixes, develop certain technologies that concern them only indirectly, and influence the consumption behaviour of end customers.

The sections below inform key corporate stakeholders of the issues associated with carbon neutrality and the levers companies can deploy to fully utilise their transformational power.



A Restructuring value chains with suppliers and customers

1. Decarbonising supply chains

The supply chain is on average the source of 11 times more emissions than direct operations³⁶. For many sectors, this item accounts for the biggest share, if not the bulk, of Scope 3 emissions (retail, food, luxury, textiles, pharmaceuticals, almost all activities using living and renewable resources, etc.). Reducing their impact across the vast majority of these sectors is a priority for climate strategies. The aim is not only to limit the climate impact of those emissions, but to help companies reduce their supply chain exposure, and therefore their exposure to market uncertainties and regulatory developments. This would open up an opportunity to strengthen links with suppliers and create new opportunities.

A project of this nature is complex because companies have only partial and indirect control over their supply chains, and emissions are spread across different geographical areas by direct and perhaps some indirect suppliers. A CDP survey of suppliers of the companies it analyses revealed that, while Scope 1 and Scope 2 were measured

by 71% and 55% of companies respectively, that figure fell to 20% for 'goods and services purchased', similar to the levels of their own suppliers. The decarbonisation of supply chains is thus a major opportunity. SBTi illustrates this aptly by the mandatory factoring in of Scope 3 if it accounts for more than 40% of a company's emissions, which is usually the case.

Emissions measurement is both a beginning and an end, since it allows on the one hand to identify the main sources (stages, suppliers, materials, etc.), and on the other to choose priority actions and monitor their effectiveness. The measurement is commonly an assessment rather than a calculation of actual emissions due to the lack, or the varied nature, of data (see chapter on measurement), and the difficulty in allocating emissions to one or more inputs. However, it does allow companies to act and make headway on this issue: the 205 CDP supply chain members approached 23,487 suppliers in 2021, compared to 15,637 in 2019, an increase of 50%.



PLASTIC OMNIUM

Involving the entire value chain in reducing CO₂ emissions

Plastic Omnium is part of the major trends that are accelerating the transition to clean mobility by developing numerous innovations for the electrification and energy efficiency of vehicles. A total of €300 million has been invested in new energies, and in hydrogen in particular, since 2015 (around 15% of R&D).

In 2021, Plastic Omnium built its roadmap to become Net-Zero by 2050. This roadmap, validated by the Science-Based Targets initiative (SBTi) as aligned with a 1.5°C trajectory, includes the following medium-term objectives:

- Reduce Scope 1 and 2 emissions by at least 80% by 2025 and offset residual emissions through certified projects.
- Reduce Scope 3 upstream and Scope 3 downstream emissions by 30% by 2030.

For the upstream part of Scope 3, Plastic Omnium is working with its suppliers to reduce the CO₂ emissions associated with its purchases. Suppliers are asked to make a commitment, as well as, report CO₂ emissions so that issues can be mapped. CO₂ will gradually become a

criterion that will strengthen the purchasing policy. Regular webinars will enable communication with the entire supplier community to highlight the best initiatives and monitor progress plans.

In addition to sharing best practices, partnerships are being formed. For example, the company is working with TotalEnergies to develop solutions that integrate up to 100% recycled materials into product manufacturing.

In the downstream part of Scope 3, Plastic Omnium designs and manufactures solutions that limit environmental impact by: leveraging aerodynamics, reducing weight, controlling pollution, connectivity and recycling.

For example, Plastic Omnium has initiated a feasibility study with one of its carmaker partners on front bumpers that incorporate 50% recycled plastics. These materials are subject to the same quality, safety and durability criteria as virgin plastic. The study showed that this concept meets all the conditions for market launch and mass production.

36 Engagering the chain: driving speed and scale, CDP Global Supply Chain Report 2021 <https://www.cdp.net/en/research/global-reports/engagering-the-chain>



The Carbon Tracker: equipping the electrical industry for carbon neutrality

The success of Yuka, an application that provides detailed nutritional and environmental information on consumer products, reflects consumers' growing expectations for product transparency. The results are present: the average user's shopping cart is evolving, leading to concrete actions by brands, which are reviewing the composition of certain products. It is therefore possible to transform an entire industry by providing reliable and understandable information to customers. Based on this observation, Rexel, distributor of electrical and energy equipment for professionals, has developed the Carbon Tracker. The result of more than a year of development, this tool provides the customers with a detailed analysis of the carbon footprint of the purchased products. The calculation method has been critically reviewed by Bureau Veritas.

The Carbon Tracker's algorithms are continuously fed with new, reliable, and verified environmental data, Environmental Product Declarations (EPDs), as well as technical and commercial product data, to accurately estimate the climate impacts of all the products in Rexel's catalog, at every stage of their life cycle.

The results are sufficiently detailed to identify relevant reduction actions at customer level, or even at the scale of a specific site or project. This is a real added value for customers of the electrical industry, who are increasingly asking for advice and tools to reduce the environmental impacts of their worksites, even before the project begins. Supported by Rexel experts, they can then choose the most climate-friendly products.

The Carbon Tracker illustrates the necessary commitment of all actors within an industry to contribute to carbon neutrality. Its development required a great involvement from suppliers: the most advanced ones have adapted their processes to provide quality and standardised data. At the other end of the value chain, customers have been involved in the development to ensure that the tool would meet their needs.

Rexel, which made a commitment to the SBTi in 2022 to develop Net-Zero targets, thus has a tool that enables all actors in the value chain to reduce their climate impacts.

Purchasing policies are often the first tool companies resort to, be it to select, evaluate or support their suppliers. Codes of best practice or standards (see Kering box) are an operational aspect of those policies, as they can factor in manufacturing processes and their energy or carbon efficiency. As it does for its internal decisions, Renault Group uses a price per tonne of carbon to monitor the CO₂ footprint of its parts, based on the weighting of purchased materials and parts.

Supplier **commitment programmes** usually complement the approaches of major groups. Different procedures exist according to the specific features of companies, value chains, supply-demand balances and competition. A selection based on materiality analysis is usually made. SNCF and Imerys, for example, have committed to SBTi, under which 70% of their suppliers (in terms of emissions) will have set targets by 2023 (SNCF 70%, Imerys 71%). Collaboration with suppliers takes many forms, from simple communication of the customer's policies to training and awareness-building. The introduction of reliable

and easy-to-use monitoring mechanisms (reporting, auditing, etc.) for both suppliers and customers is still so complex that digital tools are being employed to address the issue. Lastly, the establishment of positive and negative motivators (factoring into purchasing and relationship assessment criteria, etc.) is the subject of special discussions.

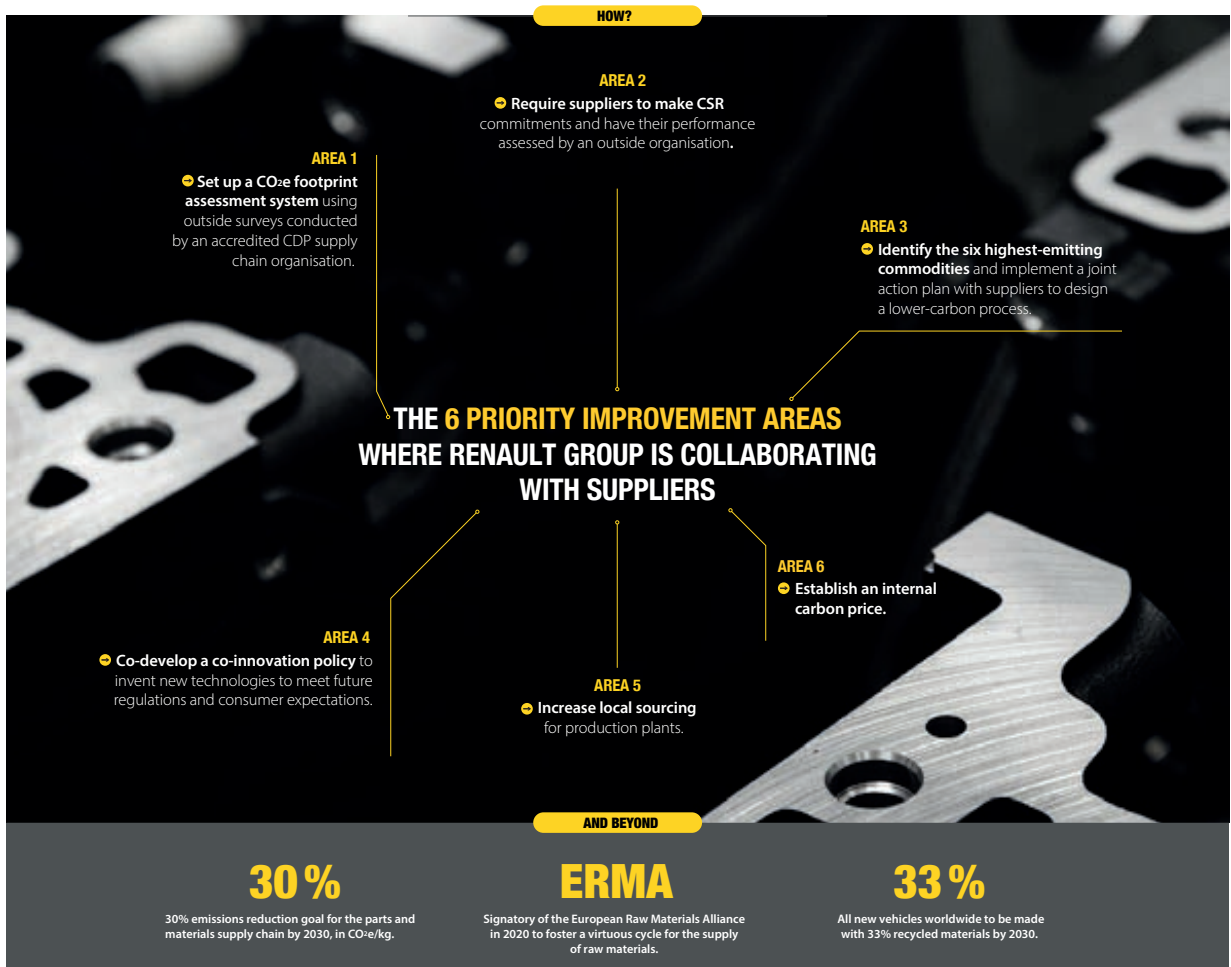
Product development is probably the most ambitious lever as it can lead to the **restructuring of value chains**. Working on the life of a product, its design and even its use, sometimes involving a switch from the sale of a product to the sale of a service, often leads companies to mobilise not only the purchasing department, but also R&D as well as marketing since the end customer is affected by the transformation. For example, the design of new automotive equipment by Plastic Omnium is undertaken in close association with its own automotive manufacturer customers. Ultimately, these approaches can lead to the creation of new ecosystems and partnerships, which are sources of innovation.

Renault Group

Involving the entire supply chain

The extraction of raw materials and the manufacture of parts will account for 15% of the carbon footprint of a group vehicle in 2020, the second largest item after "well-to-wheel" emissions. Involving its 15,000 suppliers in a process to reduce their environmental footprint is therefore one of the priorities of the Renault Group's climate strategy.

In 2020, the group was ranked among the 7% of companies most committed to the animation of their value chain by the CDP Supplier Engagement Leaderboard.



Climate report - April 2021

2. Anticipating investments and transformations in value chains

Decarbonising corporate value chains and, ultimately, consumer behaviour is tantamount to replacing recurrent spending on almost exclusively imported fossil-fuel energy with investments in cleaner, more efficient and decarbonised equipment, lifestyles, and related infrastructure. Arranging transition investment sharing is essential for fairness, efficiency and speed of implementation.

From a **macroeconomic perspective**, the annual investment needed for transitioning to carbon neutrality has been estimated at around \$9,200 billion, or about 8.8% of global GDP, including \$3,500 billion in additional investment compared to today³⁷. In France, climate investment in 2020 amounted to €44.7 billion, or 8% of total investment and 2 % of GDP (Panorama I4CE 2020), and is expected to exceed €80 billion a year over the 2023-2030 period.

The **profitability of these investments** is a key criterion for raising capital. McKinsey has estimated that, under 2020 conditions, half the investments required in Europe do not have a positive business case (95% for industry, 85% for construction, 46% for energy, 36% for transport, 11% for agriculture)³⁸. However, a price of €100/TCO₂ or policies having an equivalent effect would make 80% of those investments profitable.

Sharing the extra costs among stakeholders is particularly crucial in **sectors that are difficult to decarbonise**. Some heavy industry- and heavy transport-related activities are difficult to electrify and therefore to decarbonise (road, sea or air transport), as are activities that release structural or industrial process emissions (cement, steel, hydrogen, plastics). The decarbonisation of these sectors therefore means price increases for intermediate products, estimated by the UK global think-tank Energy Transitions Commission at +20% for steel, and +100 % for cement, shipping and international transport³⁹.

For companies in these sectors, pressure from international competitors, who do not necessarily have the same rate of decarbonisation, makes investment in decarbonisation solutions contingent on support or protection mechanisms, such as state investment grants or border carbon-adjustment mechanisms, to prevent price increases from posing a threat to business.

In other cases, it is possible to pass the extra costs related to decarbonisation along the value chain. Being able to provide customers with proof of good or better product performance along with lower carbon content allows extra costs to be passed downstream. For example, the Environmental Product Declarations provided by Vallourec for its customers enable them to factor in the products' carbon performance, with a guarantee for their own emissions calculations. Co-investments and partnership projects also allow for the pooling of additional costs and risks (see CMA CGM box).

For the **final consumer**, the impact of heavy industry decarbonisation can be small, since the extra cost of a decarbonised raw material is diluted among all the components making up the final price. The price of a single house built with decarbonised cement would rise by 3%, and that of a car manufactured with decarbonised steel using CO₂ capture and storage processes by 1%. However, the effects on demand and the purchasing power of the population as a whole are difficult to estimate. On the one hand, bigger investments and higher energy prices relative to labour income [McKinsey 2022] could lead to lower income redistribution, and thus lower consumption. On the other hand, a reduction in the trade deficit, job creation resulting from these investments, and a redistributive carbon tax could offset some or all of that effect.

37 The net-zero transition what it would cost what it could bring, McKinsey, January 2022

<https://www.mckinsey.com/business-functions/sustainability/our-insights/the-net-zero-transition-what-it-would-cost-what-it-could-bring>

38 How the European Union could achieve net-zero emissions at net-zero cost, McKinsey, December 2020

<https://www.mckinsey.com/business-functions/sustainability/our-insights/how-the-european-union-could-achieve-net-zero-emissions-at-net-zero-cost>

39 Possible mission: Reaching net-zero carbon emissions from harder-to-abate sectors, Energy Transitions Commission, November 2018

<https://www.energy-transitions.org/publications/mission-possible/#download-form>

Sharing the costs and benefits of value chain decarbonisation

Tackling value chain decarbonisation offers multiple benefits to a company, including:

- **Improved risk and cost management.** GHG-intensive segments of the value chain are more vulnerable to changes in resource costs and more exposed to regulatory compliance risks.
- **Compliance with stricter** and rapidly changing regulations at the intersection of trade and sustainability.
- **Increased competitiveness,** through a better ability than peers to respond to growing pressures from the company's customers and investors, as well as from civil society.
- Visibility on the long-term strategic direction that can enable **the identification of new commercial and innovation opportunities** in low-carbon businesses.

▶ **The decarbonisation of value chains also brings benefits to society at large.**

For example, it can support the decarbonisation of companies upstream of the value chain in the most polluting industrial sectors (production of steel, cement, aluminum, or chemicals such as ammonia, air, sea and long-distance

road transport). In these sectors, the costs of decarbonisation are significantly higher, margins are lower and technologies are sometimes nascent or not mature. Financial and regulatory support is necessary to accompany the transition of these sectors.

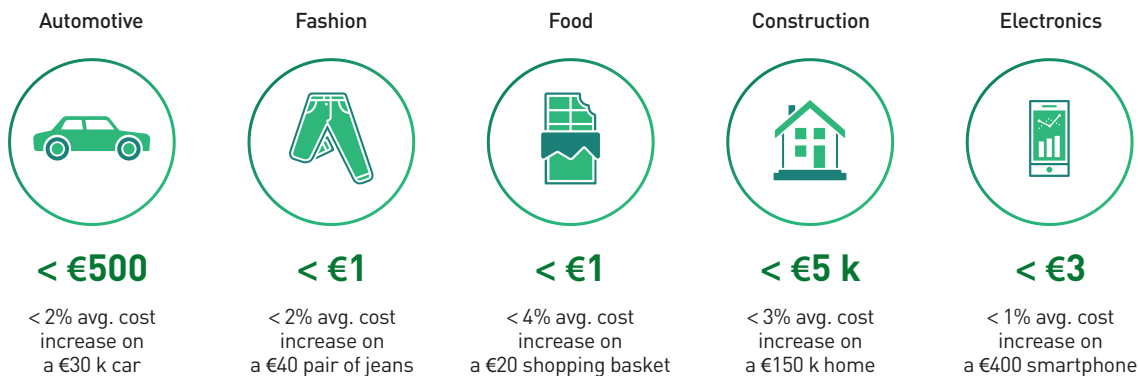
It also helps to support a just transition in countries where decarbonisation may be affected by the lack of financing, access to technological innovations and the priority of short-term socio-economic development.

▶ **Contrary to popular belief, tackling the decarbonisation of one's value chain can be relatively affordable...**

According to a BCG analysis for the WEF report, Net Zero Challenge, The Supply Chain Opportunity (2021)¹, 40% of GHG emissions could be reduced with available and affordable levers whose reduction cost is less than or equal to €10/tCO₂ (energy efficiency, renewable energies...) The study showed that the impact on the cost to the end consumer of the transition to zero-emission value chains is only 1-4% for the main expenditure items.

¹ https://www3.weforum.org/docs/WEF_Net_Zero_Challenge_The_Supply_Chain_Opportunity_2021.pdf

Full decarbonisation (including Scope 3) has low impact on end price





Sustainable Aviation Fuels (SAF) as main lever to decarbonise air transport

Sustainable Aviation Fuels (SAF) are set to become the main lever for decarbonising air transport in the coming years. Produced from non-fossil fuel sources, they reduce CO₂ emissions by 80% on average over the fuel's life cycle. They can be used today without any modification to aircraft and flight operations and are gradually replacing traditional fuel.

SAF are of two types :

- 2nd generation biofuels, produced from biomass - in particular used oil or agricultural waste, which do not compete with food crops - available now
- synthetic fuels - also called "power-to-liquid" or "e-fuels" produced from CO₂ captured in the atmosphere and hydrogen present in water – recently also certified and currently in the research and development phase

Feedstock used to produce SAF must meet high sustainability criteria. Air France only selects fuels whose sustainability is proven and certified by independent bodies such as the RSB or ISCC+.

The production of these fuels is currently very limited due to the lack of a sufficiently developed industrial sector, and their price is 4 to 8 times higher than that of fossil fuel. This is why Air France is working alongside its industrial and academic partners to ensure the rapid emergence of production facilities in France and in Europe, which should lead to price reduction.

In May 2021 Air France operated the first long-haul flight from Paris to Montreal powered by sustainable aviation fuel manufactured in France. This was the first time that fuel with this level of sustainability has been used on this type of flight, since it enabled a 91% reduction in CO₂ across the whole of its life cycle. Calls for projects supported by the French state have also been launched to drive engineering studies, as a first step towards production units building. Regulatory incentives will be necessary to scale up production and allow infrastructures production creation economically viable for producers and operators.

The gradual incorporation of SAF has a dual objective: to contribute to the decarbonisation of our operations, and to meet the growing demand from our customers, as purchasing SAF enables them to reduce the carbon footprint of their trips. As of 2022, all flights departing from France will incorporate on average the equivalent of 1% of sustainable aviation fuel following French regulation. The overcost has been transparently reflected in Air France tickets prices through a SAF contribution, ranging from €1 to €4 in Economy class, from €1,50 to €12 in Business class – depending on the distance. In parallel customers can since January 2022 contribute voluntarily to complementary SAF purchase on Air France website.

By 2030, Air France aims to incorporate at least 10% of this fuel on all its flights, to achieve 63% in 2050. In this way, we support the SAF incorporation objectives of French and European roadmaps, whilst at the same time aiming to exceed them.



Accompanying customers in the construction sector towards the low-carbon transition

The construction sector is faced with major challenges: durability and resilience of structures, reduction of soil artificialisation, recycling of materials, etc. In addition to actions to reduce its own impacts, Lafarge has decided to implement an approach to support its customers in the ecological transition, at all stages of the construction life cycle:

- 1 - upstream:** minimising the environmental footprint of production, transport and packaging;
- 2 - on the building site:** making the environmental impact of our products clear;
- 3 - during the life of the building:** improving the quality of life and work of end customers;
- 4 - downstream:** contributing to waste recycling and being a player in the circular economy.

Despite the long-standing availability of low-carbon products, the market's appetite for products with a high environmental value has remained limited for a long time.

Lafarge has therefore developed a responsible marketing strategy designed to raise awareness, convince and support the construction sector in the low-carbon transition.

The 360Score environmental labelling defines the environmental performance of Lafarge products according to two criteria: carbon footprint and recycled material content. Products are classified from D to AA, a low-carbon concrete that offers a reduction rate of about 70%. ECOPact A+, for example, is a solution that is part of a carbon neutrality approach. This concrete consists of an Ecopact A (50% reduction) and the purchase of carbon credits.

In addition, the online tool 360Design allows project managers and owners to simulate the carbon footprint of a building's shell during the competition, project, tender and construction phases and to compare it with those of similar constructions.

B Promoting and facilitating the transition to sustainable lifestyles with consumers

In the context of activities' decarbonisation, the business-consumer relationship is centred on two goals: to retain or attract new customers, and to transform business organisation, products and services in an effort to decarbonise them. People have high expectations for sustainable and responsible consumption. The 2021 Greenflex-ADEME^[40] poll found that 83% of French people 'would like to live in a society where consumption is less important, and expect companies, retailers, and brands, above all others, to make strong commitments.

The context of the pandemic, like the climate emergency, has led to a somewhat different search for balance, with 66% of respondents saying 'it is difficult to find products that are good for health and the environment'. The incentives, indeed injunctions, to consume (shopping sales, pleasure, contributions to economic growth) regularly conflict with these expectations and with calls for sensible consumption.

A new issue emerging in public debate is that of an affordable transition. There is a real split between consumers whose stated priority is to avoid 'the end of the world' (18%) and those focused on 'the end of the month' (31%)^[41].

The **development of low-carbon, affordable and sustainable products and services** is thus becoming a major issue for companies. For 64% of French people, the fact that a brand offers sustainable products reinforces their trust in it. This change in the relationship to consumption can also be perceived among consumer associations, many of whom (Indecosa-CGT, ADEIC, CNAFC, etc.) now explicitly include the relation between consumption and environment in their approach. Many low-carbon products and services deliver co-benefits in terms of quality of life, and even social inclusion. Making them available to all households is one of the components of a just transition. Finance for Tomorrow, the sustainable finance initiative by players in Paris' financial sector, has accordingly incorporated consumer rights and protection into its just transition programme.

This expectation is clearly evident in the field of **energy**, particularly with regard to housing heating projects. So that everyone can enjoy the benefits of an insulated home (savings on energy bills, less noise, greater comfort), landlords and businesses need guidance from public policies. In the aftermath of the Covid 19 crisis and its successor the energy price crisis, the issue of energy insecurity is becoming more critical as expectations of social innovations grow. Against this background, in 2021 EDF announced a moratorium on disconnections for non-payment of bills in exchange for power restrictions which will be implemented via 230 solidarity advisers throughout France.

With regard to food, according to ADEME, consuming better quality label-bearing products (AB, Red Label, etc.) while reducing one's carbon footprint does not necessarily cost more^[42], but requires consumer information, even training. Mass catering could be a driver for change in this area.

Lastly, electric **mobility** solutions are dependent on initial investment and widespread access to infrastructure, both of which are determined by collective choices.

Even in the absence of financial support, consumer plays a vital role in changing consumption patterns in a number of ways. First, it enables brands to provide tangible evidence of their actions, for example by highlighting transparent and reliable procedures such as the Environmental Product Declarations associated with Michelin e-Primacy tires (see box). Moreover, well-conceived consumer information contributes to **collective education**. Accordingly, ADEME currently promotes a hundred or so valuable environmental labels to guide consumer choices towards responsible consumption practices (waste reduction, new food habits, etc.).

From a business perspective, environmental transition through consumer information requires investment in the **training of marketing and communication teams**, which involves re-inventing the role businesses can play in bringing about these new lifestyles.

40 <https://info.greenflex.com/contenu-barom%C3%A8tre-greenflex-ademe-2021-focus-sectoriel>

41 https://www.ey.com/fr_fr/consumer-products-retail/future-consumer-index-focus-sur-le-developpement-durable

42 <https://bibliothec.ademe.fr/consommer-autrement/1947-manger-mieux-gaspiller-moins-9791029708480.html>

To ensure messages make better sense, ADEME has issued recommendations on the proper use of such terms as 'carbon-neutral territory', 'certified carbon-neutral brand', 'climate-neutral range', 'zero-carbon service', 'carbon neutrality for life', 'zero-carbon product', and 'CO₂-neutral event'^[43].

Influencing **social standards and promoting new representations of desirable lifestyles** is also a way of accelerating convergence between the supply of sustainable products by companies and demand for them. The fact is that the lifestyles projected by the products and services promoted or even the context in which they are showcased will have positive or negative effects on the environment.

Aware of the importance of making attractive lifestyles conducive to the ecological transition, EpE members have published a transition guide identifying 10 stereotypes that need to be replaced by new visions for desirable futures^[44].

Companies delivering direct services to end consumers regularly conduct surveys, some of which are rich in information on perceptions of climate issues or on specific expected measures. The Impact Score introduced by Havas measures the contribution of corporate communication to social and environmental issues.

HAVAS PARIS

Measuring the impact of advertising representations

Each day, millions of consumers are touched and influenced by advertising. Advertising is one of the biggest drivers of social change and therefore plays a key role in the transition to a more sustainable society.

Developed by Havas Paris, the Impact Score is a tool for measuring the impact of the representations conveyed by its clients' advertising (and not the topic of the advertising itself). It provides a result for each campaign that indicates its degree of impact (positive, neutral or negative) on major environmental and social issues inspired by the SDGs.

The objective is twofold: to support companies and brands that wish to measure the impact of their advertising campaigns on society, and to monitor the impact of the agency's campaigns. As part of its B-Corp certification process, Havas Paris has committed to testing all its campaigns with this tool.

For each campaign tested, two questions are asked to a representative sample of the French population:

- Does the campaign impact your perceptions on these key societal issues (image of women, climate protection, fight against discrimination...)?
- Beyond the product, does the campaign encourage you to adopt responsible practices?

From the survey responses, a final score out of 100 is calculated based on 3 criteria, forming the BRI index:

- **Behaviour:** how much does this communication influence individual behaviours;
- **Relevance:** how many different key themes are positively impacted;
- **Intensity:** the intensity of the positive impact on the theme the brand is most involved in.

The Intensity criterion has more weight than the others in the calculation of the index because it is not necessary to reach all the themes with a single campaign to have an impact. Managing to have a positive impact on representations and behaviours on one or two themes is already a big step. It is part of Havas Paris' long-term goal to accompany its partners towards an ever greater positive impact on society.

43 <https://bibliothèque.ademe.fr/eco-responsabilite/5335-utilisation-de-l-argument-de-neutralite-carbone-dans-les-communications.html>
44 <http://www.epe-asso.org/representations-des-modes-de-vie-et-transition-ecologique-novembre-2021>



Acting and communicating in favor of sustainable mobility

Michelin is mobilising all its know-how in the service of ever more sustainable mobility, acting and communicating responsibly by covering all the key stages in a tire's life cycle.

Having established that 80% of a tire's environmental impact is due to the usage phase, Michelin is placing the improvement of tire performances and their footprints at the heart of its innovation. In fact, low rolling resistance tires contribute significantly to the energy efficiency of road transport and thus to reducing the carbon footprint of combustion engine vehicles.

In 2021, Michelin launched the e.Primacy tire using an eco-design approach in order to reduce their environmental impacts, by studying the entire life cycle. The aim of such an approach is to find a good balance between product performance, cost, and environmental impact. This is necessary, as is making it known, and consequently the launch of the e.Primacy was accompanied by the publication of an environmental product declaration (EPD)¹ - a first for the tire industry - which allows customers to find out about the environmental specifications for the range. They are therefore informed that, on average, driving on e.Primacy tires allows for reducing their CO₂ emissions by

5 g/km, i.e., a reduction of 174 kg at the end of the tires' lives. In order to allow customers to appreciate the real environmental benefits of its products, the group has established a transparent and verifiable environmental communication, based on scientific proof, allowing them to assess the challenges and the scale of the impact reductions.

The group has been innovating for low-carbon mobility for over 20 years. The life cycle assessment and eco-design are essential tools for reaching the group's long-term objectives: increasing energy efficiency of tires and the use of sustainable materials while simultaneously improving other performance factors. Raising customer awareness of a product's environmental performance must therefore also be a way of adding value to investments in innovation.

¹ Certified by Bureau Veritas and available at [environdec.com](https://portal.environdec.com/api/api/v1/EPDLibrary/Files/4dd4f141-2ef0-45b2-6dbd-08d8c1d44507/Data)
<https://portal.environdec.com/api/api/v1/EPDLibrary/Files/4dd4f141-2ef0-45b2-6dbd-08d8c1d44507/Data>

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EPD®
THE INTERNATIONAL EPD® SYSTEM
Environmental Product Declaration
In accordance with ISO 14025:2010

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C Organising structured collective approaches with peers

The Fashion Pact, the Global Alliance for Buildings and Construction, the Net Zero Asset Owner Alliance, the Power past Coal Alliance, the Glasgow Financial Alliance for net zero, the Hydrogen Council, the Poseidon Principles, and OP2B are some of the many examples of international, multi-stakeholder alliances formed in the last ten years to reduce emissions and environmental impacts. In all, 151 alliances have been identified by the United Nations Global Climate Action (Nazca) platform. They supplement and impart momentum to the intergovernmental climate negotiations that have fostered their emergence. As a result, their role was officially recognised at the COP21 in Paris.

Because of their decentralised nature, it is complex to identify and analyse them. A **survey** carried out by the French Climate Action^[45] network of 107 coalitions identified a preponderance (57%) of sectoral alliances (transport, energy, agriculture, or 12 %, 9% and 7% of the total respectively), as well as multiple cross-cutting approaches (climate finance, territories, or 10% and 7% respectively). While half the coalitions are actively implementing tangible projects, the vast majority are involved in awareness-raising/training activities, consultancy (reports, studies), and stakeholder exchanges.

Commitment devices are a specific form of initiative to create momentum within a sector (Fashion Pact, GFANZ, etc.) on a particular issue (EV100, RE100, EP100, etc.), or across issues (Race to Zero, French Business Climate pledge, SBTi, etc.).

Some initiatives deal more explicitly with how to bring about **sectoral transformation**. Shipping (see CMA CGM box) has now become a sector rich in initiatives (Coalition for the Energy of the Future, Carbon War Room Shipping Initiative, Getting to Zero Coalition, Sustainable Shipping Initiative, etc.) because of the importance of the issue, its international dimension, the sector's need for profound transformation, the existence of a dedicated UN organisation, the International Maritime Organization (IMO), and the expectations of customers who account for a proportion of Scope 3.

The Poseidon Principles are a collective initiative in which signatory banks commit to introducing annual carbon intensity accounting for their shipping portfolios, and assessing their climate alignment with decarbonisation pathways. With this in mind, decarbonisation pathways have been defined for each vessel size and category, and a tool developed to measure the difference between a vessel's carbon intensity and the level required to meet IMO targets.

Players in France's financial sector have been making a concerted effort for several years to turn the Paris financial market into the world's green finance capital. A host of initiatives (Climate Finance Day, the Sustainable Finance Observatory, among others) have been launched with the aim of developing a hands-on collective approach (see Amundi box) and accelerating the transformation of all the sectors they finance.

At COP26, thirty companies joined the First Movers Coalition. Presented by Joe Biden with the backing of the World Economic Forum, the coalition aims to prepare the large-scale deployment of necessary solutions by 2030. Under the scheme, companies commit to future volumes of purchases required by these solutions to facilitate investment in technologies and industrial capacity across their upstream value chains.

Coalitions can also have a multi-stakeholder dimension, bringing together governments, businesses, NGOs, and associations. The 'Breakthrough Energy Catalyst' launched by Bill Gates at the same COP26 event aims at mobilising the public and private sectors to step up the deployment of new technologies in the fields of energy storage and green hydrogen, among others.

At the local level, partnerships allow companies with complementary skills to tie up, for example to exploit secondary material sources by recycling certain flows, and to supply the end markets that use them. The addition of innovation capacity, flexibility and skills can help to overcome technological and organisational challenges, pool risks and investments, and build new markets^[46] (see Airbus box).

45 https://reseauactionclimat.org/wp-content/uploads/2020/11/etatdeslieux_coalitions_reseauactionclimat.pdf
46 <http://www.epe-asso.org/les-partenariats-socle-de-leconomie-circulaire/>



Decarbonising maritime transport through strategic investments and partnerships

CMA CGM, a world leader in shipping and logistics, is firmly committed to the energy transition of its activities. During COP 26 in Glasgow in 2021, the group announced its commitment to drastically reduce its GHG emissions by joining the "Race to Zero", a United Nations initiative that brings together companies aiming to become **Net Zero Carbon by 2050**. To achieve this goal, the group has made several strategic investments and is mobilising its entire ecosystem through several key partnerships and multi-sector coalitions.

As early as 2017, CMA CGM group invested in a fleet of vessels powered by natural gas, becoming the first shipping company in the world to equip its giant container ships with this type of "dual fuel gas" engine. The fleet now consists of 27 ships and will be expanded to 44 by 2024. The technology of these ships allows to go even further in terms of decarbonisation since it is already compatible with the renewable energies of the future: biomethane (-67% of GHG), synthetic methane (up to -80% of GHG) and e-methane (produced from 100% renewable energy). At the same time, CMA CGM is exploring all technological solutions to decarbonise its activities: hydrogen, vehicle assistance, electricity, etc.

To accelerate the energy transition, the group supports the development of renewable energy production and distribution channels by forming strategic partnerships:

- CMA CGM has teamed up with EveRé, Elengy and TotalEnergies to launch France's first biomethane production project at the Grand Port Maritime de Marseille, a low-carbon fuel produced from organic waste collected in the Marseille Provence area.

- the group has also entered into a long-term strategic and industrial cooperation with ENGIE to develop projects for the production and distribution of synthetic methane (including e-methane) on an industrial scale. This partnership facilitates the pooling of the two groups' knowledge and R&D work, particularly on key technologies such as CO₂ capture and green hydrogen production.
- at the same time, the group is contributing to the development of operational bunkering capacities for these energies wherever it operates, as illustrated by its participation in the first LNG bunkering operation for a container ship at the Grand Port Maritime de Marseille with TotalEnergies.

To go further, the group is working within the "Coalition for Tomorrow's Energy", initiated by Rodolphe Saadé, Chairman and CEO of the CMA CGM group, with the support of the President of the French Republic. Composed of 17 major international groups representing the entire value chain of the sector, its ambition is to pool the R&D efforts of the various members, to promote and test the use of new technologies designed to decarbonise all modes of transport (land, sea and air), and to prepare for the implementation of future regulations setting the trajectory for GHG reduction. 10 projects are currently under study.

AIRBUS

Multi-purpose hydrogen hubs in airports

The airline industry has made an international¹, European² and national³ commitment to achieve net-zero emissions by 2050. Its decarbonisation roadmap is clear: it is based on the renewal of fleets with new generation, more fuel-efficient aircraft (an average 20% reduction in emissions since 2018), the improvement of flight and ground operations (approximately 10%), the switch to sustainable aviation fuels (approximately 50% reduction) and the launch of the first hydrogen-powered aircraft in 2035 (14% reduction).

Considering that "green" hydrogen for aircraft propulsion offers the most sustainable potential for reducing the climate impact of aviation, Airbus is focusing its efforts through a "ZEROe" program aimed at developing the necessary technological breakthroughs. A major challenge of this transition is the adaptation of airports, the implementation of a new supply chain and new infrastructures for handling large quantities of hydrogen in anticipation of hydrogen-powered aircraft fleets. The "Hydrogen Hub" on airport concept allows Airbus to anticipate and share the

risks and learn from a large number of hydrogen users in the airport area: ramp vehicles (tractors, passenger buses), ground mobility around the airport (parking shuttles, buses, cabs), goods transport in cargo areas (forklifts, trucks, utilities), and finally stationary applications (cogeneration, emergency generators). The airport is therefore destined to become a multi-purpose supply and distribution hub, allowing each of the players to become familiar with the particularities of hydrogen on a daily basis, to ensure optimal risk management and to contribute to the public's acceptance of this new energy vector. With this in mind, Airbus has entered into numerous partnerships with French and European airports (Aéroport de Paris, Lyon, Toulouse-Blagnac, etc.) that also involve several major energy companies.

1 ATAG - Way point 2050
 2 Destination 2050
 3 CORAC - Décarbonisation du Transport Aérien - December 2021

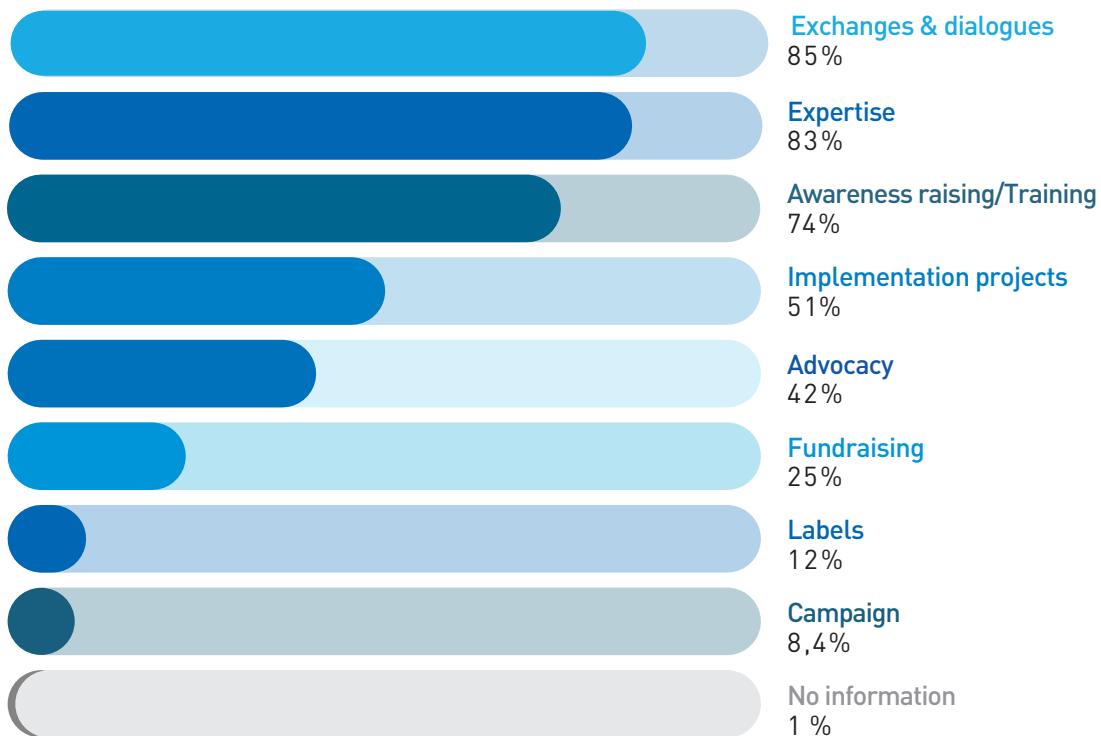


Figure 11 / Types of activities of multi-stakeholder coalitions (specific database, 107 coalitions)

Source: Overview of multi-stakeholder coalitions, Réseau Action Climat, 2020

The COP 21 marked an acceleration in the mobilisation of French financial sector players to support the ecological transition of all sectors of activity. The Paris financial centre has organised itself through several collective initiatives such as the Climate Finance Day, which has catalysed commitments through its seven editions, or Finance for Tomorrow, the green finance branch of Paris Europlace. The Sustainable Finance Observatory, launched in 2020, lists and monitors over 1,200 commitments made by more than 300 financial institutions. It also monitors the transformation of financial practices and flows (green investments, divestments of polluting energies, coal exit).

At the same time, the French financial markets authority (AMF) and the French prudential control and resolution authority (ACPR) report in 2021 that all financial players have now defined a date for exiting coal, and have put in place more demanding exclusion criteria and thresholds with regard to this energy. They also point out that there is still a great deal of methodological work to be done in terms of transparency of information, consistency of definitions and monitoring of exposures in order to ensure comparability and reliability of data on all fossil fuel exposures.

The report submitted by Yves Perrier, Chairman of Amundi, to Bruno Le Maire in February 2022 proposes a framework for action to meet the challenges of structuring the Paris financial center to make it a benchmark for the climate transition. It emphasises the global industrial revolution underway, the considerable investments needed between now and 2030 and the change in approach required. It also points out the complexity of the distribution of efforts and costs between consumers, capital owners and public authorities and the importance of long and medium term planning.

The report makes 24 recommendations, including:

- **Standardisation of carbon accounting:** set the terms of application of the taxonomy and carbon reporting by companies - in particular on the definition of Scope 3 measurement conventions for each sector and on the integration of CO₂ data in investors' portfolios.
- **Evaluation:** develop analysis methods to rate the strategies for exiting all fossil fuels and the effectiveness of their implementation, year after year.
- **Corporate practices:** evolve processes and promote new governance practices, for example by integrating carbon performance into compensation packages. Train all stakeholders.
- **Financing practices:** implement a cost of capital that is differentiated according to activities and the carbon intensity of counterparties, and develop financial innovation, in particular by directing capital to developing countries, where the need for low-carbon infrastructure is greatest.

D Demonstrating strategy and attracting funding from investors

Since COP21, the financial sector has resolutely embraced climate issues, in particular due to the mobilisation of its various constituents (banks, insurance companies, institutional investors, asset owners and managers), and the adoption of new regulations, such as Article 173 of France's Law of 2015 on Energy Transition for Green Growth (LTECV) and the recent sustainable taxonomy projects, including the EU's taxonomy regulation. The driving force behind these changes has been the development of numerous methodologies (reporting, calculation of low-carbon indices, portfolio decarbonisation, etc.). The challenge for companies is to retain access to the financing needed for their low-carbon transformation, while meeting the demands of their own climate-driven investors.

Financial players have their **own climate policies** which they apply to their investments, financing operations and equity acquisitions. These can include exclusion policies that stop or limit the financing of certain assets. Accordingly, each French bank and insurance company has set a date to exit thermal coal⁴⁷. Portfolio assessment enables financial players to measure their exposure to climate risks, in particular by consolidating their holdings in companies active in the fossil energy sectors. The ACPR-Banque de France report of December 2021 notes that total exposures reported by French banks at the end of 2020 amounted to €134 billion for conventional hydrocarbons, €20.5 billion for non-conventional hydrocarbons, and €5.4 billion for coal. However, making estimates is a complex exercise. As the report points out, even lists such as the NGO Urgewald's Global Oil and Gas Exit List (GOGEL), which could serve as a benchmark, hardly identify all the sector's stakeholders. Ultimately, such policies could lead to divestment, namely asset resales. Natixis Assurances had committed to stop holding assets, in companies over 10% of whose turnover came from thermal plants or coal mining for thermal use by the end of 2021.

Customer support policies and individual commitment also allow investors and shareholders to act proactively on corporate climate strategies, as does shareholder activism whereby pressure is put on a company's management through discussion, widespread adoption of corporate policies, general meeting resolutions, divestment, etc.

Without going to these lengths, **shareholder dialogue** can encourage companies to develop decarbonisation strategies compatible with the Paris Agreement, with shareholders tabling climate resolutions at general meetings more and more frequently. Say on Climate, popularised in 2020 by the activist Children Investment Fund, calls upon corporate leaders to submit their climate strategy annually to a shareholder vote. Shareholders also define voting policies at general meetings, communicating such policies to companies, usually in advance. Most of them call for GHG emissions reduction commitments, fossil-fuel exit strategies, and green-activity financing.

Collective actions are additional levers. Investor coalitions such as Climate Action 100+ enable shareholders to attain the threshold for tabling resolutions (0.5% in France) and to muster votes. The development by the sector of reporting referentials (CDP, TCFD, etc.) also facilitates the delivery of transparent, reliable and comparable information for the purposes of monitoring and benchmarking climate policies.

On the other hand, the last few years have seen companies step up shareholder involvement in their climate action. In April 2021, Vinci became the first French group to submit a resolution on its 'environmental transition plan' to shareholders, which was approved at the general meeting by a 98.1% majority. Other groups like TotalEnergies have since replicated this practice. Annual presentations of climate strategy by companies are not mandatory, but often appreciated. They are also more motivating for the board of directors backing the strategy than a resolution put forward by shareholders.

Corporate communication aimed at potential investors is an opportunity to leverage new sources of finance for low-carbon business transformation projects. The rapid growth in responsible investment in fact gives companies easier access to finance. The publication of a European taxonomy makes access to capital more selective and should accelerate the ecological transition.

47 <https://acpr.banque-france.fr/deuxieme-rapport-commun-acpramf-suivi-et-evaluation-des-engagements-climatiques-des-acteurs-de-la>

As an asset manager, La Financière de l'Echiquier (LFDE) plays a role in the economy's carbon neutrality trajectory through its direct investments in listed companies. In 2021, LFDE has defined its climate strategy in which several commitments have been made.

Strengthening governance

LFDE's management, as well as all employees, have been trained in climate issues. In addition, tools for monitoring climate risks have been integrated into the Risk Committee that oversees investments. Finally, a Climate & Biodiversity Committee has been created to monitor the implementation of the climate strategy and propose new levers for action.

Measuring the impacts

Measuring the climate performance and transition contribution of investments is essential to making informed investment decisions. LFDE publishes the carbon footprint of all its portfolios (Scope 1, 2 and 3), assessed by an external service provider, and is committed to measuring their alignment with a 2°C trajectory as well as their green share by the end of 2022. For SRI-labeled funds, an impact

is sought by aiming for a carbon footprint lower than that of benchmarks. There are methodological discrepancies, particularly for "portfolio temperature" measurements, which is why the selection of data providers must be rigorous, ensuring that their methodologies are robust. LFDE also intends to progressively extend their scope.

Mobilising companies

As a shareholder of listed companies, LFDE also supports companies in their transition through voting and engagement. Voting at General Meetings, firstly, by supporting climate resolutions such as the Say on Climate or opposing resolutions approving a climate strategy that is not in line with the TCFD's recommendations. Secondly, individual commitment, when it involves close dialogue with company managers to encourage them to implement concrete actions. The efforts are then monitored over time and LFDE communicates them publicly. The commitment can also be collective when LFDE joins other asset management companies in a coalition, such as the CA100+ that LFDE joined in 2020. Finally, if these actions fail, LFDE may have to divest.

E Informing oneself and others within civil society

Over the last few years, the rising number of linkages between climate, economic and societal issues has been accompanied by greater focus on the contribution of business to society (*Pacte Law, société à mission*, etc.). Companies now pay more **attention to their stakeholders** - parties who participate, influence or are affected by their activities - and consider customers (95%) and suppliers (82%) to be their main external stakeholders⁽⁴⁸⁾. However, most businesses (75%) have also seen a sharp rise in expectations among civil society groups (local communities,

environmental NGOs, media, etc.), which are increasingly emerging as essential partners. Their new legitimacy reflects significant growth in their expertise, the need for strong answers to the societal problems (inequality, climate) that the current system has failed to anticipate or avoid, and their mastery of digital tools, which facilitate the emergence of alternative voices. The integration by business of these new interfaces with society is leading to new forms of interaction.

48 Dialoguer avec ses parties prenantes pour améliorer sa résilience, où en sont les entreprises françaises [Discussing with stakeholders to improve resilience: how are French companies doing?] Comité 21, June 2021

Various **civil society groups** have taken climate issues on board. The school climate strikes, initiated by Swedish activist Greta Thunberg in 2018, and subsequently incorporated by the Fridays for Future and Youth for Climate movements globally, including France, epitomise the mobilisation and demands of younger generations and their fears about their future. The ecological awakening manifesto signed the same year by more than 30,000 French high-school students directly questions big companies, particularly over their ability to offer their young employees meaningful career opportunities. In 2021, several hundred employees from 27 companies (Accenture, Airbus, AXA, BCG, Deloitte, EDF, Engie, Michelin, SNCF, Société Générale, Suez, Vinci, etc.) came together to form the *Les Collectifs* movement, thereby embodying a new type of spontaneous employee commitment and starting this conversation inside the companies themselves.

Within staff representative organisations, the social dialogue is also greener, with some 300 mainly collective but also non-majority agreements being identified⁴⁹ as having environmental concerns (mobility, teleworking, bonus, etc.). Environmental themes may not be traditionally associated with trade union doctrine, but the concept of a just transition marks a break, underpinned by the changing regulatory framework as well. The Climate and Resilience Law published in late August 2021 extending the powers and scope of action of the Social and Economic Committee (CSE) includes environmental data in the economic and social information database which employers make available to the CSE.

The organisation by companies of a dialogue with civil society can serve different **purposes**. Firstly, it enables companies to present their contribution to the wider ecosystem of stakeholders. Secondly, it demonstrates the qualities of active listening and open-mindedness to new social expectations. Thirdly, it often facilitates risk anticipation and reduction, as well as the emergence of resilience pathways. 79% of the companies surveyed said that maintaining quality relationships with their stakeholders helped them to better manage the Covid health crisis. Finally, the creation of forums for dialogue provides businesses with an opportunity to debate strategic or complex issues. Veolia got its stakeholder committee, Critical Friends, to engage in discussions on the fate of its high-carbon assets. The committee encouraged it to transform them rather than to dispose of them. That is what it has done. By participating in suchlike discussions, civil society organisations aim to get companies to give greater consideration to their concerns along with climate issues.

Depending on the goals pursued, the **means** of dialogue may also vary. From simple information devices, they can encompass more interactive approaches such as consultation, coordination, and even co-construction. The development of RTE's 'Energy Futures 2050' scenarios, for example, was accompanied by a public consultation that attracted 4,000 contributions, followed by a long phase of consultation comprising more than one hundred industrialists, NGOs and trade unions. Discussions led to two options being explored with regard to the baseline trajectory of consumption: reindustrialisation or restraint. The exchanges helped all stakeholders to move towards a common understanding of the issues at stake. For companies, the issue of internal participation remains central, involving different kinds of awareness raising tools for directors and operations managers. EDF, for example, has launched a series of conferences to address the question 'Does happiness lie in growth?' in which it highlights the controversies, paradoxes and constraints around the concept of restraint. Another example of dialogue is the citizens' consultation held by EpE and Ipsos with 23 people epitomising the diversity of French households, the goal of which was to listen to their reactions and opinions before drawing up recommendations for the ZEN 2050 study.

Dialogues such as these have the **effect** of informing corporate strategic and operational decision-making. Some companies incorporate dialogue into corporate governance (see EDF box), and even into general meeting agendas and board business. At the operational level, local branches can be set up with a formalised set of operating principles.

A number of **difficulties or limitations** may nonetheless arise. The method used to hold dialogues (choice of associated stakeholders, facilitation mechanism, taking results into account, etc.) can be decisive for their outcome. The creation of mutual trust remains a major challenge, as collaboration of this kind is not always intuitive for businesses. Civil society organisations, on the other hand, have expectations of how their messages are used, so as to justify their investment of time and to preserve their credibility. Measuring the impact of dialogues is a complex matter at the best of times, the prime indicator being stakeholder satisfaction.

⁴⁹ Négociation collective et environnement (Collective Bargaining and the Environment), Alexis Bugada, April 2021, <https://www.planetesocial.fr/2021/04/27/le-verdissement-du-dialogue-social/>



Opening to stakeholders with an independent Critical Friends Committee

For Veolia, becoming the benchmark company for ecological transformation means moving beyond solely economic and shareholder considerations and creating solutions with and for all the Group's stakeholders. This broader vision of business is core to Veolia's purpose, which holds that Veolia's prosperity is founded upon its usefulness to all its stakeholders: customers, shareholders, employees, suppliers, current populations and future generations. It is being implemented through the Impact 2023 strategic program, which commits Veolia to delivering a multifaceted performance that places the same level of attention and the same demands on its economic, financial, commercial, social, societal and environmental performance.

Numerous dialog and co-construction initiatives with stakeholders exist at every level of the group. At executive management level, the Critical Friends Committee helps the company to remain focused on its usefulness and mission. Created in 2013, it includes independent figures, professionals from the fields of ecology and social economy, from universities and from international organisations. Its members offer their opinions on strategic topics linked to the group's responsibility and reputation.

In 2017 for example, the coal sector became the target of major disinvestment and was debated by the Board of Directors. The Critical Friends Committee addressed the issue in connection with Veolia's contribution to the 2050 carbon neutrality target. Initially divided, the Critical Friends reached a consensus that selling Veolia's carbon-intensive assets (e.g. coal-fired heat networks in Poland) to "just anyone" would not solve the problem, and that it would be more responsible to retain them while investing in technical solutions (renewable energies, carbon capture, etc.) to transform them, eventually phasing out coal completely. A second committee meeting open to climate and energy experts arrived at the same conclusions. This position, presented to the Board of Directors by the Critical Friends Committee chairman, was ultimately adopted and is now integral to the Veolia Group's strategy.

F Supporting local transitions with territorial authorities

The role of **local players is important** in the transition: first for strategic climate planning purposes through regional planning, sustainable development and territorial equality schemes (SRADDET), then for operational management purposes through the municipalities and inter-municipal associations which draw up local climate, air and energy plans (PCAETs) and town and country planning documents (SCOT, PLU, etc.). Local authorities thus play the role of orchestra conductor on territorial decarbonisation issues. While GHG emissions reduction is a global problem, the implementation of adaptation solutions is mainly handled locally, as are biomass management, soil conservation and biodiversity. Moreover, being close to citizens is essential both to define national guidelines and to incorporate just transition and social vulnerability issues into them.

It is important for companies to understand the **specific issues of each territory** where they are present. This ensures that their strategy is locally relevant and can be

adjusted when required. Cities and highly urbanised areas account for the bulk of the population, of economic activities, and of GHG emissions (transport, industry, housing, etc.). 71% of GHG emissions are from urban sources⁵⁰. Rural areas play an important role in providing cities with agricultural commodities and renewable energy, as well as hosting biodiversity and such providers of carbon storage services as some agricultural and forest areas. The cement industry's sectoral transition plan points out that territorial disparities could emerge. For example, areas with carbon capture and storage potential, or large amounts of alternative fuels could become more attractive to the cement industry. On the other hand, areas that are economically dependent on cement manufacture could suffer if demand were to fall significantly (shift away from new constructions to retrofits, etc.). Among regions as among companies, there will be winners and losers in the ecological transition. Companies located in certain areas are necessarily vulnerable to downswings.

50 In 2006: IPCC, 2014. Human Settlements, Infrastructure, and Spatial Planning.

Tailoring the ecological transformation of companies to the characteristics of regional and local territories therefore seems the smart thing to do. To that end⁵¹, a 2021 report proposes and analyses three categories of action: making the organisation's climate strategy consistent with the 1.5°C target, commercialising low-carbon goods and services, and financing projects outside the value chain. The second group is probably the one with the strongest local component. Generally speaking, regional and local plans and strategies must include emission reduction in line with local targets and contribute solutions towards the achievement of those targets through the development of public transport and promotion of thermal retrofit schemes in support of the local economic

fabric and local craftworker networks. In Toulouse, Airbus has invested heavily in the town's mobility plan and in the COMMUTE project, a collaborative urban mobility management scheme that addresses the problem of infrastructure saturation and encourages new work methods (teleworking, flexible arrangements of working hours, etc.) and ways of getting around (carpooling, bus-dedicated lanes, autonomous shuttles).

Low-carbon certification also provides an opportunity for companies to partner with local carbon sequestration projects. As part of its 'Climate + Territories' programme, La Poste group has invested in 6 of the first 13 projects contributing to the development of that certification.



Créateur d'Intelligence Alimentaire

Developing a dynamic between agriculture, sectors and territories

The *Schéma Régional biomasse Grand Est* (French, Extended Est Regional biomass Scheme), a roadmap for the reasoned and balanced development of energy production from biomass, was approved on 20th October 2021, reinforcing the ambition of this resolutely agricultural region to be a **positive-energy and low-carbon** territory by 2050.

InVivo, France's leading agricultural cooperative group, whose Chairman Philippe Mangin is also Vice-President of the "Région Grand Est", is supporting this development of the local agricultural ecosystem, in particular through its subsidiary Agrosolutions, which is piloting several initiatives in the region and beyond to bring the local agricultural ecosystem and the region's ambitions into line.

- **"Ferme du Futur"**: (Farm of the Future): for the past two years, Agrosolutions' teams, in partnership with the firm PwC, have been going from farm to farm to help farmers transform their operations. This system, designed to accelerate growth and professionalisation of farmers, is 100% financed by the "Région Grand Est". It has already enabled 100 farms to establish a diagnosis and an action plan with a 10-year vision.

- **Bioenergy**: the findings of a study on the obstacles and levers to the deployment of methanisation will be applied to a pilot project in the region in order to validate the interest of this energy for the transition of agricultural systems and the territory. At the national level, a prospective study, the results of which will be communicated in 2022, will evaluate the potential of biomass that agriculture could use for energy purposes according to three scenarios by 2050.

- **Carbon**: participation in the development of numerous methods of the Low-Carbon Label (field crops, legumes, orchards, etc.), the completion of more than 40 carbon diagnoses (Carbon Think project) and the development of the Carbon Extract tool for measuring the low-carbon transition of farms (225 agricultural advisors trained, 1,300 farm diagnoses contracted), contribute to the remediation of carbon sequestration.

These tools and studies create bridges between farmers, industry players and local authorities around the agro-environmental transition of farms. These programmes also allow the region to be informed of training needs in agro-ecology and contribute to the creation of Payment for Environmental Services (PES) systems.

51 Neutralité et territoires, un cadre d'action collectif pour la neutralité carbone en France (Neutrality and territories, a collective action framework for carbon neutrality in France), June 2021, Carbone 4 for ADEME, Banque des Territoires, Transdev and France Stratégie.



PRIMAGAZ

Guiding territories in the energy transition and providing a decarbonation solution

For more than 80 years, Primagaz has been bringing gas energy to its private and business customers in the heart of the French regions, and more particularly in the 27,000 municipalities not connected to the natural gas network. Today, Primagaz is not only developing renewable solutions for all the markets it serves, but also and above all providing support to help local authorities make a success of their energy transition.

Climate change, regulations, subsidies, technical facilities: it is difficult for local authorities to find their way to a successful energy transition. Fuel oil is still the most widely used energy in a majority of municipalities with fewer than 10,000 inhabitants. However, thanks to the development and animation of its network of local partners, Primagaz offers turnkey solutions to facilitate emission reduction projects for these municipalities via propane or biopropane. Since 2021, several hundred operations have been carried out, enabling these communities to achieve CO₂ savings of around 2,000 tCO₂e. Local authorities are supported at every stage of the project, whether to manage the removal of their oil tanks, optimise their energy renovation projects or obtain the financial aid available.

Primagaz was the first player in France to distribute bio-propane (20,000 tons since 2018) - a 100% renewable energy - and continues to accelerate the development of new renewable energies, aware of the volume limits and potential conflicts of use related to the exploitation of agricultural and forestry areas. In particular, a joint venture has been set up to advance the production and use of renewable dimethyl ether ("rDME"), a new liquid biogas that can be produced from a wider range of local bioresources, in particular organic waste. Primagaz is also developing new sustainable services in partnership with other local players in order to be as close as possible to the needs of local authorities in terms of decarbonisation and thus enable them to set an example for their constituents.

In line with its purpose - to provide the energy that is essential to the vitality of the territories - Primagaz is committed to contributing to the attractiveness of the territories and to the dynamics of the local economic fabric.

G Encouraging robust action by public authorities

The adoption of robust regulatory frameworks is one of the conditions for achieving carbon neutrality. For companies committed to this goal, participating in the development of such frameworks is an opportunity to ensure that future incentives and regulations promote their own transformation and competitiveness (seed fundraising, public procurement, regulatory predictability and gradualism, level playing field between stakeholders, etc.). Formed after the Copenhagen COP, The Ambition Loop showcases businesses' climate commitment and requirements for a faster low-carbon transition. One of the solutions to stepping up the ambition of intergovernmental and national negotiations lies in ensuring that the private sector

sends strong signals to encourage policymakers and support them in the formulation of proactive policies. This approach seems to have borne fruit, as illustrated by the adoption of an ambitious Paris Agreement and the emergence of many positive outcomes from the Glasgow COP26 where companies were very active.

Various guides and recommendations have been published by business networks in recent years, including the We Mean Business coalition^[52], CERES^[53], and B-Team^[54]. Four action pathways stand out: internal practices, relations with professional associations, collective action, and joint development of public policies.

52 <https://www.wemeanbusinesscoalition.org/steps-to-climate-leadership/>
53 <https://www.ceres.org/resources/reports/blueprint-responsible-policy-engagement-climate-change>
54 <https://bteam.org/our-thinking/reports/addressing-trade-association-misalignment-on-climate-policy>

Businesses can make checking the consistency between their **lobbying practices** and their stated decarbonisation strategy a greater priority. For example, CERES identifies critical points for internal audit systems to spot. These include a public position, relevant regulatory themes (clean energy, reporting, risk management, just transition) and related internal approaches, alignment between internal approaches and pathways compatible with the Paris Agreement, and proper implementation processes in the organisation. The communication by businesses of

messages to the public is considered useful for various reasons. Firstly, it creates transparency with stakeholders. Secondly, it is an end in itself, because a document accessible by all contributes directly to building collective commitment. Lastly, it ensures the consistency of the messages put across various forums. Some companies publish their position, demands and support regarding regulations, along with the internal processes and rules for their proper implementation.



Mobilising companies to support ambitious climate policies

Companies are increasingly aware of the existence of a virtuous circle between their actions and policies in the field of climate action. The solutions companies develop on the ground, serve as a basis on which policymakers can build ambitious climate policies, which will in turn enable these companies to scale up measures in line with the transition towards a climate neutral and competitive Europe. Therefore, companies which strive to completely integrate sustainability in their strategy and activities are engaging in the decision-making process, supporting ambitious climate policies throughout all sectors of the economy. Companies and business networks, like CLG Europe¹, are constantly mobilised to express this support and call for climate policies in line with the objectives of the Paris agreement. This proactive role responds both to a need for policymakers to build alliances to enact bolder climate policies and a need to counter groups which, on the contrary, are working to dilute the ambition of these policies.

In the EU, numerous companies support the Green Deal², considering that it constitutes at the same time the roadmap to achieve climate neutrality and the EU's growth strategy. This initiative represents an unprecedented opportunity for companies to have a legal framework that will enable them to simultaneously achieve climate and economic objectives. In order to amplify messages towards policymakers, these companies build coalitions and align their positions on crucial issues. For example, in 2020, in

a letter³ to European and national decision makers, more than 170 business and investor CEOs reaffirmed their support to the Green Deal and called on the EU to set a greenhouse gas emissions reduction target of at least 55% by 2030. The President of the European Commission, Ursula von der Leyen, made a direct reference to the letter when announcing that she was proposing the same objective during her State of the Union speech. The most progressive companies are now engaged to promote an legislative framework fit to achieve this objective and enable them to play a key role in this process⁴. Recently, more than 150 business leaders released a letter⁵ calling on the EU.

- 1 <https://www.corporateleadersgroup.com/corporate-leaders-group-europe>
- 2 European Commission 'A European Green Deal' accessible at : <https://www.corporateleadersgroup.com/news/business-letter-ursula-von-der-leyen-ahead-eus-repowerEU-plan>
- 3 'Over 170 business and investor CEOs urge the EU to raise EU 2030 GHG emissions targets to at least 55 per cent' accessible at: <https://www.corporateleadersgroup.com/reports-evidence-and-insights/ceos-urge-eu-to-raise-emissions-targets#:~:text=In%20an%20open%20letter%20coordinated,ambitious%20implementation%20of%20the%20EU>
- 4 More information on these activities is available in this link: <https://www.corporateleadersgroup.com/clg-europes-fit-55-package-knowledge-hub>
- 5 'More than 150 leaders call on EU to strengthen energy security by accelerating the green transition' accessible at: <https://www.corporateleadersgroup.com/news/business-letter-ursula-von-der-leyen-ahead-eus-repowerEU-plan>

Trade associations and federations often play an active role in the adoption of regulatory measures, but are sometimes accused of lowering targets to protect their weaker members. The nature of their work and operations can lead them to favour the conservative positions of some members over the more proactive ones of others. A case in point, highlighted by the NGO InfluenceMap, is the role played by several trade associations in the US withdrawal from the Paris Agreement^[55]. By contrast, B-Team's toolkit 'Addressing trade association misalignment on climate policy' gives companies the tools to develop a positive commitment on the part their trade associations. The best practices identified are relatively similar to those put in place by investors: identification of organisations supported by the company and their positions on climate policies, assessment of their alignment with those of the company and, if necessary, evaluation of discussions which may ultimately lead to the company's withdrawal from one or more associations. Since 2019, TotalEnergies has been conducting an annual assessment of the 20 trade associations identified as being the most significant on climate issues, based on their support for six criteria, including alignment with scientific recommendations, compatibility with the Paris Agreement, carbon pricing, the role of natural gas, and the role of renewable energies. The results have led the group to withdraw from three associations and engage in discussions with several others. Sometimes, such assessments are also carried out externally, particularly by investors^[56].

As well as communicating with policymakers, **collective action** and participation in coalitions drive proactive companies to get their peers on board. In the run-up to COP26, some 800 companies addressed an open letter to the G-20 member states^[57] in September 2021 calling for an end to coal use, the abolition of existing fossil-fuel subsidies, and delivery on climate funding commitments. Public and collective support is all the more essential in times of crisis. The platform signed by 93 French business leaders at the outbreak of the Covid pandemic, calling for the environment to be at the heart of economic recovery, sent a strong political signal. At the European level, the Corporate Leader Group is one of the initiatives championing the business case for ambitious public policies.

In France, '**co-construction**' between public and private stakeholders has facilitated both dialogue and the emergence of concrete initiatives. Cooperation between government and sector-specific businesses within the framework of the National Industry Council's sector strategic committees led to the publication in May 2021 of decarbonisation roadmaps for the chemicals, cement and mining/metalworking industries. ADEME is also helping to draw up sectoral transition plans^[58] with 9 sectors (steel, aluminium, cement, ammonia, chlorine, ethylene, paperboard, sugar, glass). Such initiatives are valuable because they allow deployment of available levers, guide corporate pathways and encourage investment.



PAPREC

Co-constructing public action by joining forces with local stakeholders

The recycling industry and the waste management sector in general have evolved considerably over the last 30 years in the sense of environmental protection. This professionalised and industrialised sector is subject to increasingly strict regulations.

Paprec's waste recycling and recovery activities contribute to the development of the circular economy at local, national and international levels. The industrial model aims at a sustainable production mode: a virtuous objective that the group shares with public authorities and which must be a lever for dialogue and co-construction. It is important that the decisions taken are realistic and can be implemented.

The collection and management of waste requires to consider many factors: territorial, social, geographical ones, etc. Waste issues are not the same from one territory to another, depending on the existing industries or consumption patterns for example. It is therefore essential to be as close to the field as possible.

Paprec strives to design advocacy actions with all stakeholders: to create synergy between players and to promote ambitious and realistic actions that are part of the more global ambition of the ecological transition. To ensure the sustainable development of its activities, the group works on a daily basis with other partner associations such as Orée, FNE or Humanité & Biodiversité in a long-term perspective, in order to take positions that favour the environment, for example to identify and close illegal sites. At the local level, co-construction also involves dialogue with associations, local residents, local elected officials and local companies, in particular to defend the acceptability of our businesses through local benefits, in terms of employment for example.

55 <https://influencemap.org/report/Trade-Groups-and-their-Carbon-Footprints-f48157cf8df3526078541070f067f6e6>

56 <https://totalenergies.com/fr/info/associations-professionnelles-auxquelles-compagnie-adhere>

57 <https://www.wemeanbusinesscoalition.org/g20-2021/>

58 <https://agirpourlatransition.ademe.fr/entreprises/demarche-decarbonation-industrie/actualites/plans-transition-sectoriels-decarboner-lindustrie>



The sectoral transition plan drawn up by ADEME in consultation with industry

"The Sectoral Transition Plans developed by ADEME aim to give visibility to industrialists and public players through a prospective decarbonisation exercise for 2050. The sectoral trajectories aim to illustrate the salient issues of the sector through marked transition contexts and to fuel discussions with the stakeholders concerned. In the case of the cement industry, ADEME has published the result of nearly two years of work carried out in consultation with the sector's main players."

Elliot Mari, Industrial Decarbonisation Engineer - ADEME Industry Department

A forecasting exercise was conducted to establish a reference scenario. In this scenario, CO₂ emissions will decrease by 54% between 2015 and 2050. It consists of modeling the existing decarbonisation levers and those with a potential already well identified by the players in the sector. This scenario, which corresponds to existing solutions today but which does not allow the sector to reach its neutrality objectives (which are -81%), is based on a relative decrease in demand (-13%), a decrease in the rate of clinker used, the decarbonisation of the thermal mix and the deployment, on 20% of the sites, of Carbon Capture and Storage technologies. This scenario requires €4.4 billion of investments.

An exercise based on an obligation of result (-81%) was also carried out in order to compare two scenarios inspired by the ADEME scenarios 1 and 4.

- **"Extreme shock - low-tech sobriety" scenario** based on a radical change in demand (-60%): in this hypothesis, the number of new buildings falls while a new model of society based on sobriety is put in place. This situation generates a decrease in the market, with wood being preferred to concrete for example. The investments of the financial sector are only 250 million euros.
- **"Extreme gamble - techno-push" scenario** based on a massive deployment of the technology: in this hypothesis, the price of CO₂ becomes a compass for the industrialists, carbon capture and sequestration as well as the decrease of the clinker rate are the main tools to reduce emissions. Demand remains strong (-6%) as does the need for investment (€7.7 billion).

Lafarge participated with interest in this co-construction exercise and in the formulation of courses of action to accelerate and support the sector's transition. This enabled Lafarge to share its expertise and its vision of the sector and to enrich it with the perspectives of other players.



L'investisseur durable d'un monde qui change

Encouraging companies to improve their corporate climate lobbying policies

BNP Paribas Asset Management began its work on "Paris-aligned corporate climate lobbying" in 2018 and is witnessing very rapid uptake by institutional investors – a good sign that investors are coming to grips with the climate crisis and beginning to focus on the importance of strong public policy and the role that corporations are playing. In 2021, BNP Paribas Asset management continued its leadership on the topic of corporate climate lobbying, encouraging companies to align their direct and indirect (particularly through professional associations) lobbying efforts with the goals of the Paris Agreement.

To go beyond simple dialogue, BNP Paribas Asset management has submitted two proposals as a shareholder requesting an assessment by the Board of Directors of the lobbying efforts of each company in relation to the climate objective set by the Paris Agreement, with ExxonMobil (United States) and Delta Airlines (United States).

In 2021, and for the second consecutive year, Exxon-Mobil sought permission from the Securities & Exchange Commission (SEC) to omit BNPP Asset Management's proposal. This proposal was successfully defended at the SEC, then received a majority vote (64%) at the company's Annual General Meeting. Following this, ExxonMobil undertook the assessment requested and published reports in 2022 in line with the requests expressed in this shareholder proposal.

In the case of Delta Airlines (USA), the proposal also received a strong majority (63%) in 2021, after a 46% vote in 2020.

The page features two large, overlapping blue circles. One circle is a solid, medium-thick blue, while the other is a lighter, semi-transparent blue. They overlap on the left side of the page, with the solid circle being in front of the lighter one.

Conclusion

Three key issues concerning the role of business in society

Sébastien Treyer,
Director General of the French Institute for Sustainable Development and International Relations (Iddri)

Transitioning to carbon neutrality is henceforth one of the key elements in the modernisation of major industrialised economies and corporate strategies. This study shows how it is not only revolutionising businesses' overall strategic objectives, but also leading to internal transformations and reshaping the relationship businesses have with their ecosystem. As the IPCC Panel 3 report shows, the transformations needed to achieve carbon neutrality involve sweeping changes in both the technical infrastructure used for the supply of goods and services, and the social and economic characteristics of demand, whose overall physical impact cannot continue to grow without exceeding planetary boundaries. At the crossroads of factors structuring supply and determining demand, corporate business models are being fundamentally called into question not only because they must anticipate inevitable or desirable shifts, but also because they themselves help to shape the supply and demand patterns of tomorrow. The striking feature of this study is the rise in corporate responsibility and the identification of three key pathways for the future.

The first concerns the relationship between business (individually and collectively) and public policymaking. Corporate commitments are essential in encouraging governments to take a more robust stance on transformation. Once this process is established, co-construction and negotiation of long-term public policies, such as the National Low Carbon Strategy (SNBC), are an essential step in the preparation of a reference document for public action, including regulatory action. They also provide a framework and context for private sector initiatives, while laying down alignment criteria for the implementation of corporate decisions and strategies, in addition to sector-based roadmaps. While the SNBC does not actually set corporate

targets, it does provide key guidelines on energy supply, taxation, broad industrial options, and so on. However, as this publication shows, it will have to issue preliminary guidelines, for those who want to give up negative emissions to offset their residual emissions, on how to share highly limited carbon capture capacity. Corporate action and zero-carbon pathways inevitably need to be embedded in national schemes where businesses play a key role in ensuring their development, scope and feasibility.

The second pathway consists of approaches that enable long-term performance targets (percentage of emissions reduction, carbon budget) to be translated into tangible changes in key business decisions and related investment sequences. As the sectoral exercises such as those in the 'Deep Decarbonisation Pathways' initiative show, the SNBC referential and sectoral roadmaps allow companies to embrace a transformation approach that is no longer driven by some external emissions reduction obligations, but as voluntary trade-offs between core business development options.

Finally, the third pathway includes corporate governance and investor and shareholder relations. The transformations discussed in this study require particularly sensitive trade-offs and strategic choices. The strategic realignments required to carry out radical transformations in the coming decades affect all fields (business products and services, markets and supplies, production methods, etc.). To bring them about, companies will have to establish a fit-for-purpose and ongoing dialogue with shareholders that confers on their change strategies a legitimacy and impetus commensurate with the goal pursued.

CONCLUSION

The transformational challenge

In early April 2022, at the time of this publication going to press, the final section of the IPCC's Sixth Assessment Report recalled that keeping the global temperature rise below 1.5°C requires immediate and sweeping reductions of all greenhouse-gas emissions. Waiting would only force the required emissions reduction rates to socially unacceptable levels.

Our study illustrates the diversity and extent of the transformations under way in EpE member companies and the actions they are taking towards this common goal here and now.

It shows that companies in the financial, energy, transportation, construction, agricultural, and luxury sectors have embedded the urgency and magnitude of the risks associated with climate change in their policies. For many, climate strategy is the core element and driver of their corporate strategy. The speed of this transformation nevertheless depends on external factors which they must adapt to and influence. They have understood that anticipating, innovating, and outpacing regulatory constraints, and creating new markets rather than to wait and see is the best way to make this transformation a strategic opportunity.

Synergies arising in the search for resilience and from wide-ranging business modernisation build on this momentum.

Since 2018-2019, the financial community has undergone a massive shift by demanding pathways to carbon neutrality. Committed individuals prepared to take action are no longer alone or isolated. Neutrality goals are being incorporated into governance, while organisational and management processes are going through the transformations required to meet those commitments. Performance monitoring, procurement, finance, human resources management, and marketing are falling into line. The practices and examples described show a major transformation at all corporate levels, driven by the need to reduce fossil-fuel use, often with the active support of employees. This momentum is spilling over to partners, and, increasingly, customers. A much-needed transformation is always a potential source of value creation and of course implies risk-taking, which is the essence of business.

Over the last few years, entire ecosystems, rather than isolated companies, are taking action. Beyond individual transformation, the need to act together is both a prerequisite and a major challenge. Joint action can accelerate or determine economic and social change, develop value chain resilience in the face of an increasingly uncertain world, and in turn even create the conditions for individual businesses' successful transformation. Sharing, explaining, informing oneself and building together are factors of success common to all collective approaches.

The issue businesses will increasingly have to address are how to ensure that the sum of individual pathways leads to collective carbon neutrality without undermining biodiversity, public health, or the joys of living. The WBCSD proposal of Corporate Determined Contributions at COP26, i.e. corporate commitments based on the Nationally Determined Contributions (NDC) model established by the Paris Agreement, could be one path.

The task ahead is daunting, but the momentum in and between companies is a fact. The many alliances and collective approaches initiated in recent years are solid. The driver group is large and strong enough to create the conditions for a sustained and successful transformation.

The presence for the first time in the April 2022 IPCC report of a section dedicated to demand confirms that a systemic transformation is vital.

Society is awaiting this transformation of the economy, because the business world has announced it and will surely willingly participate in it provided the transition is affordable and its outcomes attractive. Climate risks, indeed, are now well understood by all. From now on, business must enable new, very low emission lifestyles that deliver well-being and satisfaction to consumers, thereby ensuring an effective ecological transition.

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Abbreviations

ACT	Assessing low-carbon transition
ADEME	Agence de l'environnement et de la maîtrise de l'énergie (French Environment and Energy Management Agency)
AMF	Autorité des marchés financiers (French Financial Markets Authority)
COP	Conference of the Parties
CSR	Corporate Social Responsibility
CSS	Carbon Sequestration and Storage
EPD	Environmental Product Declaration
EpE	Entreprises pour l'Environnement
ESG	Environmental, Social and Governance
EU	European Union
GHG	Greenhouse Gas
I4CE	I4CE: Institute for Climate Economics
IEA	International Energy Agency
IMO	International Maritime Organization
IPCC	Intergovernmental Panel on Climate Change
NZE	Net Zero Emissions
NZI	Net Zero Initiative
PCAET	Plan climat-air-énergie territorial (French territorial climate-air-energy plan)
PLU	Plan local d'urbanisme (Local Urban Plan in France)
SBTI	Science Based Targets Initiative
SCOT	Schéma de cohérence territoriale (French Territorial Coherence Programme)
SNBC	Stratégie nationale bas carbone (French National Low Carbon Strategy)
SRADDET	Schéma régional d'aménagement, de développement durable et d'égalité des territoires (French regional planning, sustainable development and territorial equality plan)
TCFD	Task Force on Climate-related Financial Disclosure
UNFCCC	United Nations Framework Convention on Climate Change
WBCSD	World Business Council for Sustainable Development

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About EpE

Entreprises pour l'Environnement (EpE), a French association set up in 1992, is a forum for dialogue between business leaders, environmental managers and policymakers who share the vision of the environment as a source of transformation, progress and opportunity, exchange their best practices and work together to better factor the environment into their strategies and operations.

EpE publications are available at:
<http://www.epe-asso.org/en/>
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△ Business and carbon neutrality
a collective transformation

accenture



AIG

AIRBUS

AIRFRANCE

Air Liquide

Amundi
ASSET MANAGEMENT

apave



BASF
We create chemistry



BNP PARIBAS

BCG
BOSTON CONSULTING GROUP

BPCE



CHANEL



CMA CGM



CRÉDIT AGRICOLE S.A.

Crédit Mutuel
Alliance Fédérale

Deloitte



ENGIE



FORVIA
Inspiring mobility

HEIDELBERGCEMENTGroup



GROUPE
Iliad



invivo
Créateur d'Intelligence Alimentaire

KERING

LAFARGE



LE GROUPE LA POSTE

LVMH



Essentiel pour moi

Marsh



NATIXIS



PAPREC



PRIMAGAZ



Renault Group

Rexel



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