

# How are economic sectors impacted by climate change and how do they adapt?

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# CONTENTS

**P.03 PART 1  
HOW ARE ECONOMIC SECTORS  
IMPACTED BY CLIMATE  
CHANGE?**

**P.04 1.1. PHYSICAL IMPACT**

**P.08 1.2. TRANSITION RISKS**

**P.12 PART 2  
HOW DO ECONOMIC SECTORS  
ADAPT TO CLIMATE CHANGE?**

**P.13 2.1. MITIGATION AND ADAPTATION**

**P.18 2.2. TOWARDS INCLUSIVE  
CONSIDERATION**

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# PART 1

- HOW ARE ECONOMIC SECTORS IMPACTED BY CLIMATE CHANGE?



## 1.1. PHYSICAL IMPACT

Climate change – it should be remembered – is more linked to actions of human origin than to natural events. The climate crisis that we are experiencing, as scientists remind us, has resulted from an increase in the concentration of greenhouse gases since the Industrial Revolution. The most abundant greenhouse gas (two thirds) is carbon dioxide (CO<sub>2</sub>), which is largely produced by fossil fuel combustion.

Since 1988, the Intergovernmental Panel on Climate Change (IPCC) has provided detailed assessments of the state of scientific, technical and socio-economic knowledge about climate change, its causes, potential impacts and strategies for mitigating those impacts.

The recent publication of the AR6 by the Intergovernmental Panel on Climate Change (IPCC)<sup>1</sup> based on physical science shows that it is unequivocal that human influence has warmed the atmosphere, ocean and land with an unprecedented scale of recent changes across the climate system as a whole and in many aspects. Evidence of observed changes in extremes such as heatwaves, heavy precipitation, droughts, and tropical cyclones has strengthened with a best estimate of equilibrium climate sensitivity of 3°C. The global surface temperature will continue to rise until at least the mid-century and many changes in the climate system grow in direct relation to increasing global warming. They include escalation in the frequency and intensity of hot extremes, marine heatwaves, and heavy precipitation, agricultural and ecological droughts in some regions, and the proportion of intense tropical cyclones, as well as reductions in Arctic sea ice, snow cover and permafrost. Continued global warming is projected to further intensify the global water cycle, including its variability, global monsoon precipitation and the severity of wet and dry events. Changes in several climatic impact drivers would be more widespread at 2°C compared to 1.5°C global warming and even more widespread and/or pronounced for higher warming levels.

**Risk definition: Physical, the most immediate and visible risk**

As early as 1990, the first IPCC report highlighted the fact that the greenhouse effect is expected to cause ex-

treme phenomena i.e. heavy rains and increasingly frequent droughts. This finding is highly topical at a time when climate disasters are happening worldwide at great frequency, such as the heat dome in North America, acceleration of ice melting, deadly floods in Europe, fires in Greece, etc.

In addition to these severe climatic phenomena, increasing temperatures cause the melting of terrestrial ice (Antarctica, Greenland and mountain glaciers), and therefore rising sea levels. Between 1993 and 2014, the sea level increased twice as fast on average as in the period 1901 to 2011.

As a result of this evolution, climate change also results in the loss of Biodiversity. According to IPBES scientists (Intergovernmental Science Policy Platform on Biodiversity and Ecosystem Services), established in 2012 under United Nations supervision and now bringing together 137 states, the Earth is undergoing its sixth mass extinction. The loss of species has increased 100 times since 1900 i.e. a rate unseen since dinosaurs went extinct.

'Physical' risks on companies are integrated into all immediate impacts related to climate change, and the increase in the frequency and magnitude of climatic hazards (droughts, fires, floods, heavy heat, hurricanes, etc.): production difficulties (which can lead to an end to operations pure and simple), premature wear and tear of infrastructure, and lesser anticipation of increasingly extreme and volatile movements in supply (agricultural yields) or demand (risk coverage). Not to mention the rise of other demographic (migratory flows) or geopolitical uncertainties (conflicts) that can further exacerbate the impact of climate change.

Physical risks, to varying degrees, result in very material and financial risks for companies.

### Sectors impacted by Physical Risks

Physical effects of climate change are contributing to more frequent and extreme weather events, which in turn may impact ecosystems within entire regions. By definition, all companies operating in industrial sectors

1. AR6 CLIMATE CHANGE 2021: THE PHYSICAL SCIENCE BASIS

The Working Group I contribution to the Sixth Assessment Report addresses the most up-to-date physical understanding of the climate system and climate change, bringing together the latest advances in climate science, and combining multiple lines of evidence from paleoclimate, observations, process understanding, and global and regional climate simulations.

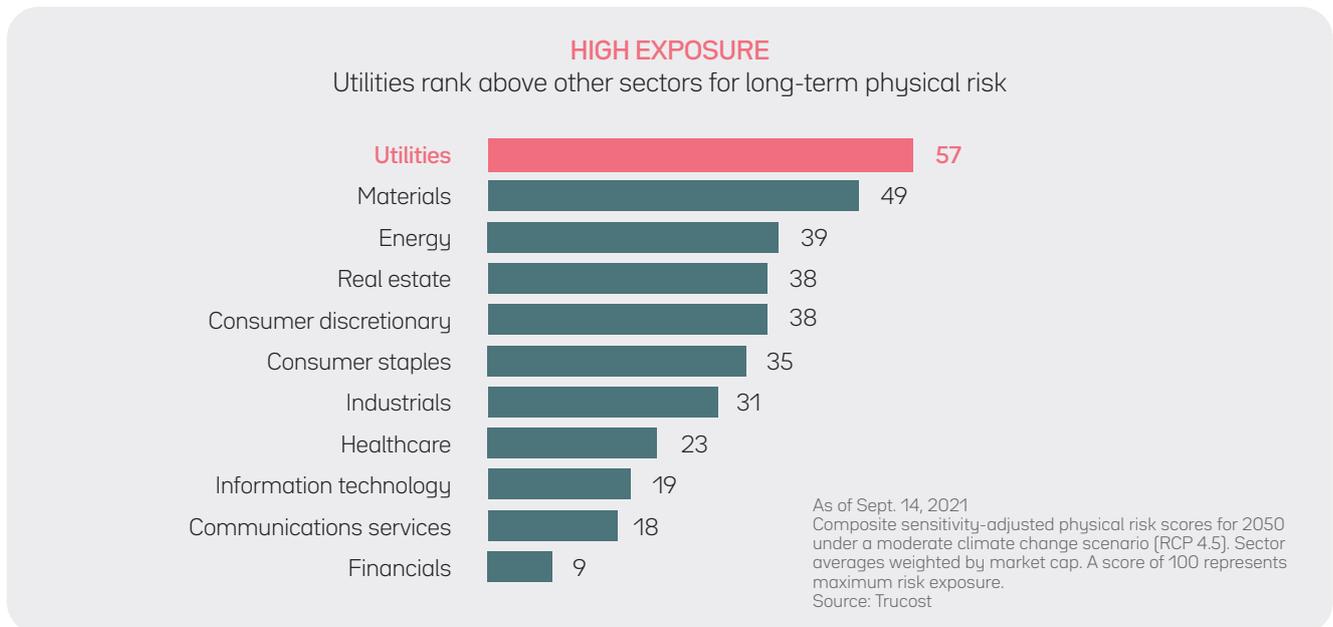
[with heavy investment in tangible assets] are exposed to physical risks and the Utilities sector is a prime example to illustrate this. Obviously, Agribusiness is also one of the most impacted economic sectors. Furthermore, when we refer to physical risk, the financial services sector, such as banks and insurers, also comes to mind. As property risk underwriters, insurers are directly exposed to higher claims associated with the consequences of climate change, but they are also exposed to the same risk in their capacity as asset owners.

● **An illustration with the Utilities sector**

The Utilities network can be damaged by unexpected weather events, such as floods, snow, falling trees, and hurricanes, which can destroy overhead cables and lead to power cuts. The outcome of a natural disaster may be very different from one country to another, depending on the local legal and regulatory frameworks. Ten years ago, we awoke to the dramatic nuclear accident at Fukushima Daiichi on the north-eastern coast of

Japan, which left 22,500 dead or missing. One year ago, we all remember the storm and subsequent flood in the Roya Valley in the south of France, which left many residents with power cuts and put a halt to the local tourism industry. More recently in July this year, historic floods impacted Belgium and Germany, and the electricity network was partly destroyed in Wallonia (Verviers): 38 people lost their lives and 25,000 clients experienced power cuts.

As the networks get older, we can expect more damaging impacts from these events, leading to power cuts. As a matter of fact, according to Trucost data, based on a large study ranking threats to the physical operations of around 15,000 public companies, *“Utilities face the highest combined physical risk from climate hazards like water stress, storms and wildfires among different industries [...]. The analysis [...] shows utilities’ vulnerability to physical climate risks generally tops other capital-intensive sectors like industrial manufacturing, oil and gas and real estate<sup>2</sup>.”*



In short, not only can extreme weather events be particularly costly for Utilities companies, but they will also bear consequences for the rest of the economy and may jeopardize communities’ ability to get electricity in time.

● **Agribusiness**

The Agri-Food sector includes all businesses in the primary sectors (farms) that produce food and secondary businesses (the Agri-Food industry) that process food into industrial foods.

**The Agri-Food industry is particularly sensitive to climatic hazards, and the effects of climate change are already visible today.** In light of the interactions and synergies between them, all stakeholders in the Agri-Food value chain face physical climate risks, from farms to consumers, including cooperatives, food processing companies as well as distribution.

“Extreme” events combined with changes in temperature and precipitation patterns generate the following physical climate risks for the Agri-Food sector:

2. <https://www.spglobal.com/marketintelligence/en/news-insights/latest-news-headlines/utilities-face-greatest-threat-as-climate-risks-intensify-66613890>

- **Thermal stress:** Prolonged periods of extremely high temperatures cause heat stress in both plants and animals, as well as yield losses. Therefore, this sector will have high energy needs for fruit cooling due to higher temperatures during harvest.
- **Water stress:** Reduction in quantity and quality of surface and underground freshwater resources.
- **Ecosystem disturbances likely to affect production:** Development of pathogens, bush fires, proliferation of invasive species, imbalance between pests and natural predators, variability of precipitation, differences between the life cycles of pollinators and associated plants thus impacting the quantity and quality of products and producing a progression or delay of the harvest.

**In a nutshell, climate change affects the agricultural production sector:** Prolonged droughts, intense rainfall, heatwaves, increased fire frequency, frost damage and early flowering will become more frequent.

Concrete examples of the physical risks incurred by this sector are already emerging, as record droughts affected the sector in 2018: Wheat and barley yields fell sharply in Germany due to the drought and heatwave, as well as Scandinavia (yields fell by 20/25%), and fell sharply in France (which is the leading cereal producer in the European Union), Italy, and the United Kingdom. Sweden, following a 40% crop loss, went from net exporter to net importer of cereals. As a consequence, in Germany part of the livestock was sent to the slaughterhouse earlier than planned in order to reduce costs due to the lack of feed grain (50% loss on maize).

In 2021, agricultural production was again affected by the poor harvest due to drought in the US, Russia, and Central Europe.

This situation affects the volumes produced and the prices of agricultural commodities, and also increases the risk of food contamination (pests).

**The Agri-Food industry is also indirectly impacted** (price volatility due to volume fluctuation, recent trend of rising raw materials and semi-processed costs, risk of supply difficulties)<sup>3</sup>.

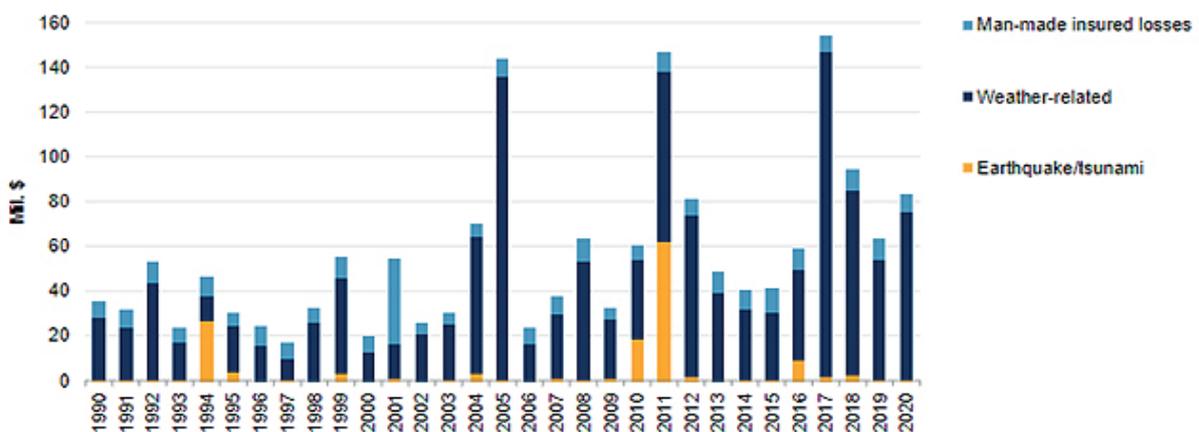
As highlighted above, there is increasing acknowledgement from experts of a direct link between climate change and the increasingly larger number of so-called secondary perils such as fires, floods, windstorms, intense heatwaves etc.

They also have a direct impact on the insurance and reinsurance industry through higher insured losses. Furthermore, they are taking place in regions previously sheltered from such events (Russia, northern Europe, India, Australia, North America, etc.), many of which are emerging markets where insurance take-up is low.

● **Banking and Insurance Industry**

According to Swiss Re, the industry has seen the second largest amount of insured catastrophe losses so far this year (after 2017), whereas so-called secondary perils have been the largest contributor to total insured losses.

**Natural Disasters Have Led To An Increase In Insured Losses From Catastrophes**



Amounts are at 2020 prices. Source: Swiss Re Institute.

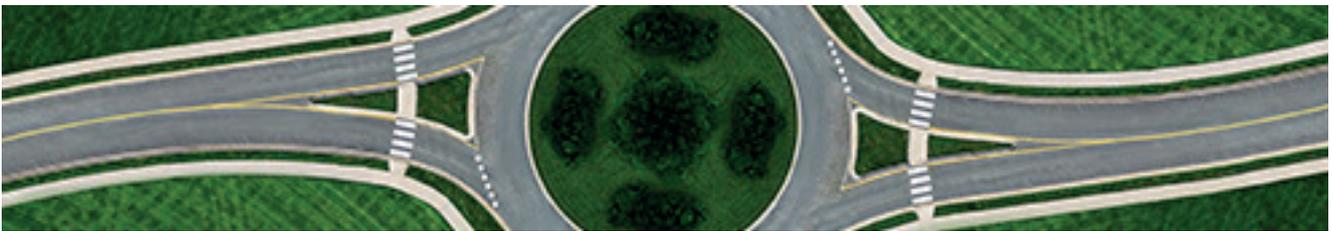
3. It should be noted, however, that this sector is also largely responsible for the impacts of climate change across its entire value chain. According to the IPCC, the Agri-Food industry contributes 21% and 37% of total anthropogenic greenhouse gas emissions and ranks fourth among the industrial sectors that emit the most GHG emissions, mainly from the supply chain. Most of these emissions come from emissions of methane CH<sub>4</sub> (45%), related to animals' enteric fermentation and the transformation of manure, and nitrous oxide NO<sub>2</sub> (41%), which, for the most part, is emitted by the soil after nitrogen fertilization of the crops. This sector is also responsible for indirect emissions, including deforestation, which accounts for 15-18% of total greenhouse gas emissions (forests are sinks for recovering the emitted carbon dioxide, so deforestation reduces the capacity of the forests to capture CO<sub>2</sub>). According to Climate Action 100+, the beverage and food sectors would account for about a third of overall CO<sub>2</sub> emissions, mainly from the supply chain. For this sector to align with the Paris Agreement and the IEA's calculations (carbon neutrality in 2050), it would have to reduce its emissions by 85%.

As asset owners, banks and insurers are equally exposed to physical risk associated with climate change.

For instance, lending to real estate is generally the largest portion of commercial banks' lending books. Physical assets, real estate property and development are exposed to so-called secondary perils associated with climate change such as wildfires, hurricanes etc., so they in turn may generate losses for the bank in its lending book: real estate developers may default on their banking loans, or simply expose the bank to diminishing collateral values for their mortgage loans.

The same can be said about insurers' corporate bond investment portfolios, which is the second asset class in insurers' asset mix after sovereign bonds. Insurance companies directly exposed to the real estate sector (loans or bonds) may see their value go down over time.

In a very comprehensive approach, the European Central Bank (ECB) points out the impact of climate change on financial stability, through banks' and insurers' exposure to existing and prospective climate-induced risks<sup>4</sup>. ECB findings show banks' exposures to climate-induced physical risks are concentrated at regional level, largely in southern Europe, with potential stranding risks, thus compounding certain structural weaknesses for banking systems in those regions.



## 1.2. TRANSITION RISKS

Transition risks cover the effects of the implementation of a low-carbon economic model, as a result of changes in policies and regulations that burden companies. They are inextricably linked to the concept of 'stranded asset.'

With the acceleration of the effects of climate change, some key economic sectors responsible for a significant portion of emissions (fossil fuels, automobiles, etc.) have seen a strong return to regulatory intervention, and increased taxation or financial constraints (carbon market) or production restrictions (emission limitation). These pressures are very concrete: They prevent companies from producing in the same way, or substantially increase the cost of production. In some cases, these regulatory changes, often coupled with environmental constraints, will result in a complete discontinuation of industrial activity, replaced by cleaner technologies.

Thus we can see that the financial sector is not preserved from physical climate risks.

As we have illustrated, physical risks are a direct consequence of climate change. With the increase in the concentration of greenhouse gases, their impacts are rising significantly, and are less predictable, which does not help companies – and ultimately investors – to identify and correctly evaluate them.

Ostrum AM works on two levels to address this issue:

- Firstly, we assign financial resources to external data to better ascertain the mapping of these risks.
- Secondly, our experts anticipate as much as possible which sectors – and within sectors which companies – are most negatively impacted. This work involves analyzing in detail causal relationships, and strategies by economic stakeholders to limit the physical effects of climate change, and as such this process enables us to accurately assess the risks associated with these impacts.

Climate risk can be also materialized by what is called transition risk, which is a different aspect of the consequences of climate change.

A typical transition risk for a car manufacturer is new air quality regulations (CO<sub>2</sub> emissions regulation in Europe, nitrogen oxides emissions in the United States, fuel consumption in China). They imply additional R&D expenses, additional costs associated with the new components to be added, potential fines, etc. This loss of value results in a loss of activity, profitability and – literally – a depreciation of assets.

Major support policies such as 'Fit for 55', as part of historic plans to reach carbon neutrality by 2050 for Europe [and US], provide the Utilities sector with huge opportunities to scale up its investments in renewable capacities. There will be winners and losers, along with many risks for power producers in particular.

The oil and gas sector is one of the most challenged industries in this new era.

4. "Climate-related risk and financial stability", July 2021  
<https://www.ecb.europa.eu/pub/pdf/other/ecb.climateriskfinancialstability202107-87822foe81.en.pdf?d38340433f58fb658f73574755835661>

## ● Oil and gas companies, facing troubled times

Oil and gas companies will face many challenges as they will have to continue their transition towards less carbon-intensive power sources.

Climate change challenges are increasingly weighing on the oil industry, since the sector accounted for 47% of CO<sub>2</sub> emissions based on final consumption in 2020, according to the International Energy Agency (IEA) World Energy Outlook<sup>5</sup>.

For years, major oil companies have seen global energy demand growing steadily, largely underpinned by demography and industrialization of emerging countries. 2020 was a significant wake-up call for the oil sector, as several companies (including BP) and institutions (including IEA) started to produce different scenarios for oil prices, where primary energy demand could be perennially lower due to efficiency improvements, renewables gaining meaningful market share supported by the growing electrification of the energy system, resulting in expectations of oil demand falling from 100 mb/d in 2019 to about 25 mb/d - 50 mb/d by 2050.

Against the backdrop of the challenge to reach carbon neutrality by 2050, coupled with a new paradigm for "lower forever" oil prices, oil companies took note and are taking different paths to adapt. However, oil majors continue to invest substantially in fossil fuel energies (especially gas), a move that is hardly compatible with a net zero approach by 2050.

The IEA surprised all observers in 2021 by calling for a halt to exploration for new unapproved oil or gas projects (IEA Roadmap towards Net Zero 2050<sup>6</sup>). According to the reference institution, pursuing development would run counter to the commitments made in the Paris Agreement.

While demand for fossil fuels remains very high, and prices attractive for oil and gas producers (prices are soaring in the aftermath of the Covid-19 crisis), the fact remains that regulatory constraints are becoming increasingly significant, especially in Europe with the gradual halt to the sale of fossil-fuel cars and significant restrictions on emissions by 2030.

Ultimately, higher carbon prices – driven by new European regulations – will most probably put greater pressure on fossil fuel energy, making clean technologies more attractive.

Lastly, in the future, oil majors will most probably face increasing litigation, with two objectives: seeking financial compensation for the damage caused by climate change, but also influencing the strategy of large oil and gas companies.

Already in 2018, New York City filed a lawsuit with a federal court demanding compensation from five oil

giants: Exxon Mobil, Chevron, BP, RoyalDutchShell and ConocoPhillips. The city blamed them for damage caused by climate change (Hurricane Sandy of 2012, which had killed more than 40 people in the city and cost the government more than 42 billion dollars). The City of New York had also asked them to finance the costs (billions) needed to prepare for rising sea levels, more powerful storms and higher temperatures. The lawsuit was rejected at the time because judges believed that it was not the role of justice to deal with the consequences of global warming. However, this stance may change over time.

In Europe, where law courts are generally more open to civil society, oil & gas majors have already suffered setbacks. In May 2021, the Dutch court ordered RoyalDutchShell to reduce its CO<sub>2</sub> emissions by 45% by 2030. The oil company was accused by a group of environmental NGOs of not making enough efforts to align with the emission reduction targets set in the Paris Agreement.

## ● Utilities: a key area of focus

The green transition for the Utilities sector began more than a decade ago with the 20/20/20 European energy climate package which was agreed upon in 2008. The main elements were to:

- Reduce carbon emissions by 20% between 1990 and 2020;
- Have 20% of renewables in the energy mix by 2020;
- Increase energy efficiency by 20% by 2020.

The move was prompted by depleting gas and coal reserves in Western Europe and the desire to curb the reliance on gas and oil imports. The Fukushima accident gave a further acceleration to the energy transition in 2011, as highlighted by Germany's most drastic decision to close 17 nuclear plants by 2022. At that time, nuclear was a major part of the energy mix, representing 22% of the total German energy mix vs 11% today. In 2010, renewable was only 17% of the German energy mix vs 43% today.

Most European countries decided to review their Energy Plan, as it was commonly agreed that it was time to transition to a greener economy. Belgium was the first country to exit coal by 2016, while France and the UK set exit dates by 2023 and 2025. Germany will exit in 2038 as it was largely exposed to coal and lignite with the Ruhr Valley. We still expect commitments from Poland, Romania and Bulgaria. A pleasant surprise came from China, which has committed to being carbon neutral by 2060. This is important as China represented 29% of world CO<sub>2</sub> emissions in 2019, with coal accounting for 60% of the energy mix. We are pleased to see China launched its own CO<sub>2</sub> market in February this year.

We consider that the Emissions Trading Scheme market is now a mature and efficient market, but it has been a long road. The coal exit approach in Western Europe

5. <https://www.iea.org/reports/world-energy-outlook-2021>

6. <https://iea.blob.core.windows.net/assets/4719e321-6d3d-41a2-bd6b-461ad2f850a8/NetZeroby2050-ARoadmapfortheGlobalEnergySector.pdf>

was accelerated by the implementation of an Emissions Trading Scheme in 2005. The market took a little time to adjust with bumps along the road i.e. VAT fraud, possibility to get free quotas in Eastern Europe to offset the bill, etc.

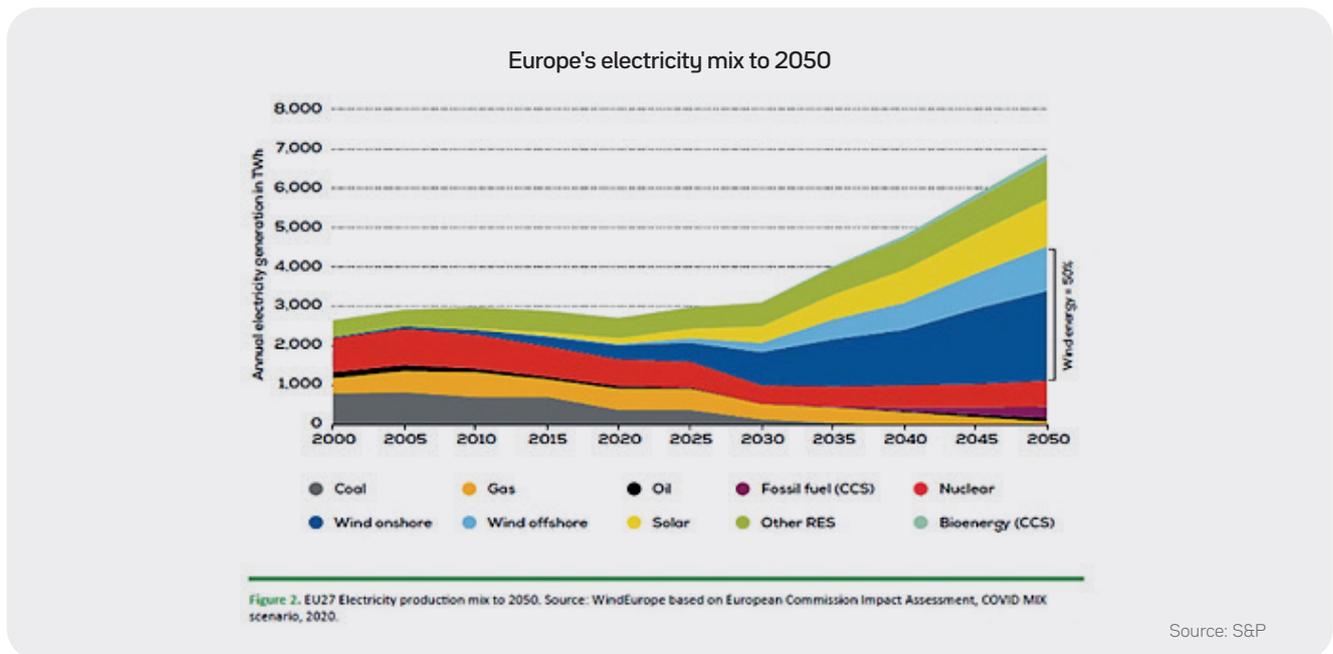
Finally, Utilities still using coal and developing new coal capacities may find it increasingly hard to obtain funding and capital, but even more crucially, they may also struggle to insure their business and projects. We are seeing an ever-larger number of insurance companies joining the Net Zero Asset Owner Alliance and Net Zero Insurance Alliance, implying that they will be implementing coal exit policies to both their asset and liability sides [i.e. the risks they provide insurance for]. That effectively means those insurance companies will simply stop providing insurance to “coal burdened” companies. In our opinion this is a much bigger problem for companies involved, jeopardizing their actual ability to stay in business. Given the relative concentration of underwriters able to insure big projects for major Utilities, finding alternative insurance is much harder than finding fun-

ding alternatives from investors across the globe in our view – in the short term anyway.

The recent increase in energy prices as a result of the gas price surge year to date is a stark reminder of the fragile balance between the non-negotiable path to transition to clean forms of energies and the related social cost.

While we do agree that the increase in gas prices year to date is most likely temporary in nature, we note that the energy transition will result in higher energy prices for two main reasons:

- Over the short to medium term, there will be lower energy capacities in Europe. About 70-80 gigawatts will disappear over the next two years on the supply side in Europe after corresponding coal and nuclear capacity closures, which will only be compensated over the same period by additions of 30 gigawatts from wind and solar power.
- ‘Fit for 55’ is ultimately about the electrification of the European economy, thus perennially levelling up the demand for electricity.



As a result, it is likely that energy prices will stay elevated at least over the next two years and only gradually decrease towards 2030, as new wind and solar additions in the energy mix will start compensating for legacy fossil capacities.

● **Transition risks are fast evolving and may become more critical than physical risks for certain sectors**

As part of European ambitions to reduce CO<sub>2</sub> emissions by 55% by 2030 and achieve carbon neutrality by 2050,

the Commission published its ‘Fit for 55’ climate plan on July 14th. Its ambition is to achieve these objectives while ensuring a fair and equitable transition for European citizens. The plan comprises 12 legislative texts which revise existing measures and initiate new ones to fight against climate change. All the proposals have yet to be negotiated with the 27 European countries and MEPs.

In its ‘Fit for 55’ plan, the European Commission proposed to extend the carbon market to the transport and construction sectors, and to the maritime sector. The Commission also plans to end free quotas on the avia-

7. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52021DC0550>

tion sector and will cut the EU Emission Trading System (ETS) quotas annually in a linear manner until 2030. To avoid unfair competition ("carbon leakage"), the EU plans to launch an unprecedented carbon border adjustment mechanism (CBAM), to impose rules on foreign players importing goods with more lax legislation than in the EU. These initiatives will most probably put greater pressure on carbon prices, making clean technologies more attractive.

Many sectors are affected, and some of these measures will be very transformative. In Transport, to reduce CO<sub>2</sub> emissions linked to the use of cars in the EU, the Commission chose to end the sale of new combustion-engine cars by 2035. In return, more electric and hydrogen charging points will be deployed. Moreover, kerosene for flights within the EU will be taxed from 2023.

A second carbon market should be set up from 2025 for road transport and heating of buildings. Compensation is also planned for importing companies that do not comply with European standards so as to avoid "carbon leakage".

### ● Green Deal: cost of CO<sub>2</sub> and impact for airlines

The Green Deal is effectively a game changer for the airlines sector, since for the first time in history, airline companies are being incentivized to take an active part in the energy transition path. This will translate into airline companies being incentivized to buy less polluting planes, and even more crucially, sustain demand for [not yet mature] technologies for lower gas emissions engines.

Short term, airline companies will feel certain financial pain for having to pay for the CO<sub>2</sub> emissions that their planes generate, even though these numbers are low in the overall context (around 1.5% of total operating costs). Only gradually and over the medium term, they will have to invest more Capex as they move their fleet towards less polluting planes.

Finally, the dimension that we believe is at the heart of the European Green Deal is that future regulation means that many industrial sectors such as airlines will represent a sustainable, steady source of demand for tomorrow's alternative technologies which for the time being are not mature or financially economical for their manufacturers, notably the airspace sector.

These various transition risks are reflected in the financial system that finances or insures all these sectors and companies.

### ● Transition Risk for Financial Institutions

As far as financial institutions are concerned, banks and insurers are exposed to transition risk in their loans and

investment portfolios: This means that banks' borrowers or insurers' investees may be exposed to increasing regulation and market pressure to adapt to a green economy, which in turn may pressure their business models and alter their ability to service their debt.

Concretely, the main risk for banks and insurers is that they end up with stranded assets on their balance sheet, especially in a scenario of a delayed or disorderly transition to low-carbon economies. The risk of writedown is the highest for banks' and insurers' investments exposed to writedowns on oil reserves (oil and gas companies) and decommissioning of fossil fuel power plants (Utilities).

According to estimates from Moody's, G20 countries' banks' exposure to carbon-intensive sectors accounts for \$14trn, or the equivalent of 19% of their lending books. This number varies significantly by region, with around 14% for European banks and as much as 30% for banks in emerging markets such as Russia, India, and South Africa. We note banks in emerging countries not only tend to have greater exposure to transition risk, but also economies have less scope to adapt.

According to the same Moody's estimates, insurers' exposure to carbon-intensive industries represents about 13% of their investment portfolio, less than banks. This is explained by the fact that insurers' investment assets are dominated by sovereign bonds, while corporate bonds (subject to transition risk) represent the second largest weighting in the asset mix. Life insurers naturally tend to have higher exposure, and US insurers more than their European counterparts.

It is crucial to understand in detail the risks borne by different industries for physical aspects but also for transition aspects, as this help assess firms within these threatened industries that will be able to adapt.

### ● Ostrum AM's ESG Material Score integrates Climate Change Risk analysis<sup>8</sup>

Our organization allows to understand the challenges and assess the positioning of the different firms in order to apply the best sector allocation and selection for our portfolios.

Understanding the future of companies we invest in means that we must anticipate upcoming events and dynamics at both the industry and company level, understand the global environment and local differences, and have insight into management's next moves to achieve a clear view of what will happen in the future. The starting point for this approach is our proprietary research process, which we have built on the basis of our philosophies and beliefs. We believe that financial metrics are lagging indicators of what will happen to a company. Meanwhile, leading indicators include un-

8. ESG integration refers to the inclusion of ESG issues in investment analysis and decisions. Approach to ESG integration varies based on the funds. ESG integration does not necessarily imply that investment vehicles also seek to generate a positive ESG impact.

Understanding the operating environment, the business model, the quality of management, the governance put in place allowing management to govern, etc.

Understanding non-financial aspects, such as the climate, is a natural part of our thinking due to their twofold materiality. Companies have had and continue to have an impact on the climate for decades due to their business operations, whereas their impact on the climate can be financially material for them; in many cases, short-term risks and long-term opportunities. In other words, the operating environment is under perpetual change and we at Ostrum AM have a duty to assess this change and the consequences for companies' ability to continue conducting their business. We need to understand regulatory risks, technological risks, stakeholders' decreasing acceptance of any controversy or negative headlines, changes in the competitive landscape from new entrants associated with new business opportunities etc. and their implications for companies.

With this in mind, and as early as 2018, we implemented Ostrum AM's proprietary ESG Materiality scores aimed at assessing the financial implications of non-financial dimensions for companies over the relevant time horizon.

Concretely, we acknowledge that there are risks and/or opportunities in relation to non-financial factors that can be material for a company franchise. The form and the magnitude of their impact may vary [from minor to strong], and we assess the magnitude of the impact depending on management's willingness and ability to detect, adapt, or face the change, and the timeframe they have ahead of them to do so.

This is a common approach between Credit and Equity, as non-financial aspects are purely a question of companies' sustainability.



# PART 2

- HOW DO ECONOMIC SECTORS ADAPT TO CLIMATE CHANGE?



In the first part of this working paper, some of Ostrum AM's experts addressed the impact of climate change across economic sectors and its impact on the risk of capital loss for investors.

In this second part, we take a closer look at the way economic sectors deal with climate risks, their strategies to adapt or mitigate the embedded risks, and the necessary journey towards more holistic approaches.

## 2.1. MITIGATION AND ADAPTATION

**To prevent or adapt to the effects of climate change, companies must combine complementary strategies:**

**Mitigation:** Mitigation strategies now enjoy strong visibility. These can be broken down into two types: Either the reduction or limitation of greenhouse gases in production and processing operations, or the protection and improvement of sinks and reservoirs of greenhouse gases for example, which overlap with forest conservation and/or expansion strategies.

The development of mitigation strategies is currently mainly focused on plans to reduce carbon emissions. Many companies have publicly announced that they would achieve neutrality by 2050 i.e. in line with the Paris Agreement. This movement is largely initiated or amplified by regulations. We anticipate that these strategies should be particularly accelerated with the adoption of the Commission's Green Deal and 'Fit for 55' plan (target of a 55% reduction in carbon emissions by 2030 in the EU), with major implications for transport, aviation, energy and construction.

**Adaptation:** These strategies cover initiatives to mitigate and transform the impacts of climate change into opportunities, where possible. Adaptation strategies lead to a thorough review of our organization methods, the location of activities, and the technologies used. Adaptation efforts are often relatively neglected, because their effects are less visible in the short term, and less easily measurable compared to mitigation strategies.

Adaptation strategies must be decided in advance by prioritizing activities, and the sectors most exposed to the hazards of climate change (physical risk). Adaptation to global warming of at least 1.5-2 degrees compared to the pre-industrial era is clearly an essential issue for sectors such as agriculture, where crop types,

seeds (and drought-resistant characteristics in plant areas in particular), and irrigation need to be thoroughly reviewed.

**Mitigation and adaptation measures are obviously costly – such as R & D, and property investments – and sometimes disruptive, requiring changes in organization or business model.**

- **Adaptation and Mitigation Strategies are encouraged by the European Union as part of its Sustainable Finance Action Plan**

By setting a priority objective to combat the effects of climate change, the European Union has developed a classification to establish whether economic activities are sustainable. This green Taxonomy should help redirect financial investments towards companies committed to reducing greenhouse gas emissions by 2050, in line with the Paris Agreement. The taxonomy is focused primarily on adaptation and mitigation strategies: They represent the first two 'objectives' to assess the "alignment" of economic activities. Mitigation and adaptation are the two prerequisites for other objectives to be taken into account (out of six objectives in total). Other objectives include water and marine resources (3), the circular economy (4), waste prevention and recycling (5), and pollution and healthy ecosystems (6).

Taxonomy regulation is a key step for the EU action plan for sustainable finance launched by the European Union. The identification of economic activities that make a positive contribution to change objectives will be paramount in efficiently redirecting investment flows. Hence the ability of companies to develop activities that are consistent with these objectives – via their revenue generation or their investment – is key to ensuring a broad source of funding from investors.

● **The economic sectors that generate most direct CO<sub>2</sub> emissions are naturally those that have the greatest effort to make**

**We mentioned that energy sectors are impacted by climate change risks, but they develop mitigation strategies.**

**Utilities, for instance,** will have to consider the need for dispatchable power on one hand i.e. – the ability to switch on and off the power button to meet longer peaks in demand or “accidents” on supply – and pursue their search for the right storage solutions to ensure a reliable system for the long term on the other i.e. batteries and storage, carbon capture, utilization and storage, and ultimately hydrogen solutions.

So far, energy transition champions have not heavily invested in such solutions. To do so, they will need visibility, and for that they must ensure that regulators and governments support them in building the path to alternative solutions, since these are not economically viable so far.

Huge capex is invested in the energy transition, i.e. €160bn for Enel<sup>9</sup> over 2021-30 and €75bn for Iberdrola<sup>10</sup> over 2020-25. Half of this capex will go to renewables, while the other half will go to networks to connect new windfarms and solar farms.

Winners are companies that anticipated the transition well in advance with plenty of natural resources (wind, sun) like Spain, Portugal and Italy. One exception geography-wise is Orsted<sup>11</sup>, the Danish utility, which has invested €27bn over the 2019-25 period and has gone from an oil and gas company to the leading offshore wind producer.

Losers will be companies that are still largely involved in coal-fired electricity generation, as financing will become less accessible, and the price of the Emissions Trading Scheme will continue to increase. By way of illustration, the price has been skyrocketing from an average €10-20 over 2005-2019 to over €60 today, and this will probably reach over €100 in the medium term.

**Concerning oil and gas,** some majors, including BP and Eni, declared their intention to become energy companies rather than just oil and gas companies by moving to broader strategies and setting targets to increase the share of renewables in their portfolios. As the transition gathers pace, we also note increased consolidation, with merger and acquisition activity ramping up, especially for independent US producers.

In 2020, all the major European oil and gas companies presented strategic plans aimed at net zero emissions by 2050. Additionally, under pressure from their shareholders and given the change in presidential majority, US groups are also initiating plans to reduce their emissions more in line with the 2015 Paris Agreement. Companies such as Chevron and Exxon Mobil are fo-

cus on carbon sequestration to reduce their carbon footprints and even small, independent US producers have started communicating on their actions to reduce their carbon footprints.

This covers various avenues including:

- Working on emissions (maximize energy efficiency, reduce routine flaring and methane emissions),
- Acting on products (expanding their presence along the entire gas value chain, pursuing their integrated expansion along the renewables value chain, reducing the average carbon content of their products thanks to biofuels, investing in recycling and biopolymers, etc.),
- Driving a shift in demand (promote the lowest-carbon products and scale back offering for certain uses, developing electric vehicle charging points in Europe, etc.),
- Developing carbon sinks: investing in natural carbon sinks and carbon capture and storage (CCS),
- Momentum for hydrogen and CCS technologies with many more projects and pilots announced initiated in 2021, also as a result of the initial move from US companies.

While we definitely welcome the stage set above, we feel that there is still significant scope for advancement to make these goals reality, in order to be able to assess their accuracy and use them to compare individual companies' progress.

For instance, each European oil major uses slightly different definitions, methodologies, and emissions boundaries. Repsol and Equinor only include upstream emissions, not downstream emissions, or third-party emissions. BP only covers emissions from its own equity share upstream and downstream production and excludes emissions from its share in Rosneft and from third-party sales. Total only considers emissions in Europe i.e. 60% of its global emissions.

The strategies are diverse, while some groups are more aggressive on renewables (Total, Equinor), reducing third-party emissions (ENI), carbon offset (ENI, Shell), energy efficiency (BP) or promotion of low carbon products (BP).

Companies also differ on the trajectories of their legacy oil and gas businesses. Some companies continue to forecast growing oil and gas production (Total, ENI) at least up to 2030/2035, while others envisage a rapid decline [-40% for BP by 2030]: In the first case, funding of capex dedicated to the energy transition could be more challenging.

All in all, we believe that oil and gas companies' net zero ambitions still exhibit several drawbacks:

- a first difficulty lies in the fact that Scope 1 and 2 emissions (those where companies have the greatest ability to have direct action) represent only ~10% of the companies' total emissions (Scope 1 + 2 + 3),

9. <https://www.enel.com/company/stories/articles/2020/12/strategic-plan-2021-2023>

10. <https://www.iberdrola.com/press-room/news/detail/iberdrola-launches-billion-investment-plan-2025-firm-commitment-economic-recovery>

11. <https://orsted.com/en/sustainability/our-strategy>

- secondly, some of the technologies envisaged are not yet mature or economical,
- thirdly, the 2050 deadline is fairly far off, even though intermediate objectives have been specified for 2030.

**Another key sector for energy transition is the transportation industry:** Companies have to adapt and move towards different models.

### ● The case of the Automotive segment is particularly exemplary

CO<sub>2</sub> reduction targets imply a fundamental technological shift for the automotive industry with the development of electrical vehicles. This technological transition requires significant investments in Research & Development – related to electrical engines – as well as industrial facilities, such as product lines and giga factories.

Most car makers have announced investment programs in this field, that can reach up to €30bn over five years for the most advanced and largest players, like Volkswagen, Toyota, BMW, representing annual investment close to 2-3% of their revenues. This is quite significant in the automotive industry, which is already capital intensive.

Moreover, in addition to the upfront transition cost – as materialized by investments – the transition cost related to electrical vehicles is also visible in operating profits, since the margin on electrical vehicles is still narrower than ICE-powered vehicles, considering ongoing moderate volumes, despite the ramp-up of this segment.

### ● Opportunities at the end of the day? Aviation decarbonization and “cleaner” fuels

Aerospace companies are working on different technologies to decarbonize aviation and thus have a key role to play in identifying tomorrow’s technologies that can support the energy transition and therefore the electrification of our economies.

Short term, electric solutions are being tested for small aircrafts. Sustainable aviation fuel (SAF) seems to be the most immediate solution: This is technically mature but requires a scale-up in production capacity to bring down cost.

Concretely, SAF (biomass-based or synthetic fuel) offers a potential CO<sub>2</sub> reduction of 85~100% compared to fossil aviation fuel. Moreover, SAF seems to be the only practical solution for medium- and long-haul flights be-

fore 2050, because it is technically mature and compatible with existing aircraft engines.

Most commercial aircrafts are certified for the use of SAF, but their use is negligible (<1%), due to the lack of production at an affordable cost. The production costs of synthetic aviation fuels are 3~6 times the current market price of fossil aviation fuel, due to low production capacity. As result, the volume of SAF accounts for only 0.05% total aviation fuel consumption (source: European Commission)<sup>12</sup>.

The ‘Fit for 55’ package<sup>13</sup> adopted in July 2021 requires the use of SAF for at least 5% of aviation fuel by 2030 and 63% by 2050. Regulatory support is necessary to scale up investments in SAF production capacity. By mandating the use of SAF, the European Green Deal aims to promote the scale-up of investments in SAF production capacity, with a view to bringing down costs over time.

Furthermore, flight tests with 100% SAF by Airbus<sup>14</sup> and Safran<sup>15</sup> are scheduled for 2022. Airbus’ commercial aircrafts are certified to fly with a fuel blend including up to 50% of SAF, while the company’s ambition is to reach a certified 100% blending capacity.

Next-generation engines allowing a 20% reduction in CO<sub>2</sub> for medium- and long-haul aircraft are next in line, and they are expected to come into service in 2030-2035.

Longer term, all eyes are looking towards hydrogen-powered aircraft, yet the technology and infrastructure are far from mature.

However, there are technology barriers that need to be overcome<sup>16</sup>, notably significant investments are required to build the infrastructure at airports for storage, supply, etc.

By way of illustration, Airbus is targeting the first hydrogen-powered regional aircraft by 2035, whereas Airbus, Air Liquide and Vinci announced a partnership to promote the use of hydrogen at airports and build the European airport network to accommodate future hydrogen aircrafts<sup>17</sup>.

### ● Agri-Food sector could be at the heart of transformative changes

It is a fact that intensive agriculture is under vast pressure, not only as a result of its negative impact on soil, water and ecosystems in general, but even more cru-

12. [https://ec.europa.eu/info/sites/default/files/refueeu\\_aviation\\_-\\_sustainable\\_aviation\\_fuels.pdf](https://ec.europa.eu/info/sites/default/files/refueeu_aviation_-_sustainable_aviation_fuels.pdf)

13. Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions Empty, ‘Fit for 55’: delivering the EU’s 2030 Climate Target on the way to climate neutrality”, European commission, July 2021. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52021DC0550>

14. Airbus Universal Registration Document 2020

15. Safran E-Réunion d’actionnaires individuels - 29 June 2021

16. The need to liquefy hydrogen and store it at minus 253 degrees Celsius remains an obvious technology barrier. Moreover, the special double-walled tank needed to contain the substance is four times the size of conventional fuel storage and would need to be accommodated into the body of the aircraft.

17. Concretely:

- By 2023, the Lyon-Saint Exupéry airport (France) should have the first installations of hydrogen gas to support the airport’s ground vehicles.
- Between 2023 and 2030, deployment of liquid hydrogen infrastructure would allow supply of hydrogen into the tanks of future aircraft.
- Beyond 2030, deployment of hydrogen infrastructure from production to mass distribution of liquid hydrogen at the airport.

cially, as it is damaging for human and animal health. It is only natural that the Agri-Food sector has been among the first to rethink its economic and environmental equilibrium. Further down the production process, multinational companies, which are the Agri-Food industry's main clients, are also under close scrutiny and are coming under pressure from governments, society and end customers to adapt.

We see various initiatives that are moving in the right direction, including the development of agroecology aimed at eliminating pesticide use, educating end customers to eat less but better-quality meat, diversifying farming towards more resistant, less water-consuming crops, improved land management protected from soil erosion etc.

Large consumer companies facing the end customer are also increasingly aware of their impact across the whole chain, and use their own societal and environmental commitments as a way to differentiate their business in the eyes of their customers. For instance, we are increasingly seeing companies certifying that they only use third-party suppliers that meet their own standards, while they can also prove product traceability, and are committing to the use of renewable energies etc. The largest companies are among the first to disclose and commit to this kind of step.

We note that both food habits and agricultural production have already started to evolve over the past several years. In France, for example, the purchase of meat products has decreased by 12% in ten years, and the production of vegetable proteins for human consumption is up by 7% per year according to the France13 protein group. As a result many groups are expanding their product offerings into vegetable-based protein products to tap into these growing markets.

### ● **Banks' and Insurers' role in financing the energy transition: How do they adapt to transition and physical risks and business opportunities?**

Given their position in the economy, banks and insurers not only have a role to play in the financing of the new, low-carbon economy, but in the process, they equally need to protect their own businesses, and hopefully seize new business opportunities for the best performers.

As asset owners, banks and insurers display their own commitments to supporting the transition to net zero. For instance, the UN-convened Net Zero Banking Alliance brings together 60 banks from 29 countries, representing a quarter of global banking assets (over \$39 trillion), while the Net Zero Asset Owner Alliance brings together 49 insurers and pension funds representing \$7 trillion, whereas the Net Zero Asset Manager initiative brings together 128 asset managers representing \$43 trillion assets under management. They are all committed to decarbonizing their lending and investment portfolios by 2050. In addition, the largest global banks and insurers have already set exclusion policies for coal and certain fossil-fuel related sectors.

In addition, eight global leading insurers and founding members of the Net Zero Insurance Alliance have committed to transitioning their underwriting portfolios – the risks they already insure – to net zero GHG emissions by 2050. Furthermore, an increasing number of insurers are committed to halting the provision of new insurance policies to carbon-intensive industries, such as the energy sector. This is a game changer in our opinion, and will accelerate the transition, but will also potentially increase transition risk for the most fragile companies. As already mentioned, over the long term, we expect an increasingly large number of companies to find it difficult to find risk transfer solutions, which may later jeopardize their very ability to stay in business.

Looking at the business risk of insurance and reinsurance companies, we see two different strategies.

On one hand, many insurance companies are telling us they do take into account the expectation of higher insured losses associated with climate change-induced physical risks and are adapting to increase premium rates that they charge for natural disasters. While this is definitely true for the short term – we are right in the middle of a price rise cycle, precisely as a result of the most recent natural disaster events related to secondary perils – we have doubts on the whole industry's willingness and ability to reprice for the risk of climate change over the very long term, given the role of insurance as a commoditized product. As an illustration, the results of the ACPR's (Autorité de Contrôle Prudentiel et Résolution, the French banking and insurance supervisor) stress test on the consequences of climate change show that the insurance sector would have to show a consistent 3% annual premium increase over a 30-year timeframe in order to cope with expected claims increases related to secondary perils over the period to 2050. That is a whole different ball game than the current price rise cycle, which is short-term in nature.

On the other hand, reinsurance companies – which are by definition very familiar with natural catastrophe losses – take a different approach. These companies describe how they simply reduce their exposure to the physical risks associated with global warming. The big players do acknowledge that future higher losses may not be adequately priced in. As long as they feel this pricing imbalance persists, they simply withdraw from this market segment and opt to focus instead on their core business, which comprises large natural disasters such as earthquakes, hurricanes and typhoons.

This only increases what we call the protection gap, especially in emerging market regions where the take-up of insurance and reinsurance is below average. As a result, what is initially an E(nvironmental) problem in ESG is becoming an even bigger S(ocial) problem, when the consequences of the rising climate risk leave human beings in distress.

However, the transition to low-carbon economies also provides opportunities for insurers and reinsurers, first and foremost as demand for property and casualty insurance will increase as the transition to the new,

low-carbon economy will require risk transfer and risk mitigation solutions. This will provide the opportunity for the largest, best-in-class insurance companies to increase their market share relative to peers if they are able to insure the future solutions.

Concerning the banking sector, in the mid to long run, the energy transition will bring opportunities namely around the financing of the transition and the growth of the green and sustainable bond market (GSS). Banks could develop new business opportunities, for instance in capital market activities with the issuance of GSS bonds.

Also, sustainable development could induce positive change in the loan mix, and lower exposure to stranded assets. However, as the situation moves in this direction, we would need to watch potential concentration risk in 'green' industries and keep a close eye on the pricing of these loans, which needs to reflect their credit risk.

Finally, with growing stakeholder awareness of environmental issues, we also think that banks and insurers on top of Environmental subjects will be in a better position to defend and develop their franchises, as they boast a stronger ESG reputation and image.

### ● Climate change strategies need more substantial investments

According to the IEA (International Agency Energy), reaching net zero emissions by 2050 requires very substantial investments in clean energy transition, i.e. tripling the current level to \$4,344 billion annually by 2030<sup>18</sup>.

Investments should be massive in clean power generation and electricity infrastructure (generation and networks). The IEA calls for fast development of hydrogen solutions and bioenergy. Another key area of investment is buildings' energy efficiency and end-use decarbonization, then industry and transport sectors.

According to the IEA, States have a major responsibility in investing directly in order to fund the network infrastructure for clean energy solutions. However, "70% of clean energy investment will need to be carried out by private developers, consumers and financiers responding to market signals and policies set by governments".

Europe is at the forefront of the transition and should alone invest up to €1,000 billion per year in the next three decades according to research carried out by McKinsey<sup>19</sup>, with close to €28,000 billion in total out to 2050. The lion's share of this – €22,000 billion – should be invested in the transition to low-carbon energy sources, and hence in related technologies.

Additionally, significantly increasing the cost of carbon would be a key driver to develop cleaner technologies. According to McKinsey, a cost of carbon at €50/ton or above would make 75% of the necessary investments for clean technologies profitable, while a cost of carbon at €100/ton would make 85% of the same investments profitable.

The Stiglitz-Stern High-Level Commission on Carbon Prices estimated the carbon price to be "at least" \$40–80/ton in 2020 and \$50–100/ton in 2030 to remain within the carbon budget and limit the rise in temperature to 2 degrees Celsius (Carbon Pricing Leadership Coalition 2017). Recently, the Network for Greening the Financial System report (NGFS 2021) declared that the global price of carbon consistent with a net zero scenario would be \$160/ton in 2030 and around \$350/ton in 2040<sup>20</sup>.

To conclude this section, we can see that different sectors are deploying adaptation strategies. The success of these strategies will depend on movements on the markets, technological improvements, speed of changes, etc. The Ostrum AM Equity and Credit research teams will closely monitor developments in these sectors and firms' adaptation capabilities, to ensure that we persistently stay fully up-to-date on future changes in these businesses.



18. <https://iea.blob.core.windows.net/assets/ed3b983c-e2c9-401c-8633-749c3feff375/WorldEnergyOutlook2021.pdf>

19. Réussir la transition de l'Europe vers la neutralité carbone, Mc Kinsey and Company, juillet 2021

20. <https://www.piie.com/system/files/documents/pb21-20.pdf>



## 2.2. TOWARDS INCLUSIVE CONSIDERATION

The way that companies deploy new strategies brings new concerns as there is potential for mismanagement. The best approaches are the most holistic as they address the complexity of climate change impacts.

### Challenges of mitigation strategies, the “carbon neutral” debate

A key challenge in the transition to low-carbon business models is to build a comprehensive and robust trajectory. There is a significant risk of greenwashing, and the concept of carbon neutrality must be handled with great caution.

The ADEME – French agency for ecological transition – recently emphasized what was expected by a “just” contribution to collective neutrality<sup>21</sup>: According to the institution, some stakeholders should aspire to higher than average ambitions to become net negative (e.g. rural territories with high carbon sinks), while others should aspire to less ambitious goals (urban or highly industrialized territories) as they benefit from fewer opportunities for sequestration.

Also, considering carbon neutrality at company level could sometimes lead to contrary effects:

- **Scope considered:** Taking only direct emissions into account often leads to neglecting Scope 3, which accounts for a major portion of emissions. However, this is challenging, as Scope 3 is sometimes difficult to attribute to one company or another.
- **Fairness:** We know that some sectors will not be able to reach neutrality. Implicitly, in order to comply with the Paris Agreement, it would be necessary for sectors benefiting from decarbonization sources (plants, for example, for the agricultural sector) to target a net negative objective rather than just zero.

- **Effectiveness:** The option of offsetting emissions with cheap carbon credits can make implementation of breakthrough actions economically irrational. Furthermore, the term ‘compensation’ creates an illusion of nullification or neutrality. ADEME advocates the use of the term ‘contribution.’ Another problem raised by carbon neutrality policies is also how companies integrate new technological solutions that allow them to capture carbon – namely carbon capture and storage – into their trajectory calculations. Indeed, these technologies are not yet mature enough, and there is significant execution risk.

While we encourage companies to think about their path to neutrality, and formalize it accurately, the concept of carbon neutrality is a global one that makes sense at a global level, not a company or sector level.

One way to mitigate this risk is not only to develop an approach to reducing emissions, but also to build complementary strategies i.e. business model transformation, development of adaptation solutions.

When our experts analyze a given company’s strategy, they apply the utmost caution when it comes to their climate commitments, and in particular their carbon neutrality commitments, as they ensure that these pledges are solid. When they are insufficient, we may decide to stop investing.

A good example is our Coal Policy implementation. In 2020, Ostrum AM decided to adopt a determined investment policy. This policy was recognized by the market and benchmark institutions as particularly demanding for companies operating in the coal sector, with the aim of making withdrawal from the sector a condition for our investment in a given company.

In practical terms, we rolled out a coal exit policy that focused equally on exclusion and engagement. In the short term, this calls not only for the application of very

21. <https://www.ademe.fr/sites/default/files/assets/documents/avis-ademe-neutralite-carbone-2021.pdf> (link in French)

strict threshold-based investment criteria – in line with the recommendations from the Global Coal Exit List (GCEL) – but also for active engagement with the companies in which Ostrum AM continues to invest in order to ensure the credibility of their coal exit plans.

We have defined very precise engagement metrics with these companies, such as the deployment of their strategy through short-/medium-/long-term milestones, frequency of communication, measurability of their actions and investments rolled out to shift their business models outside the coal sector. This engagement is conducted on a yearly basis by our in-house experts as of 2021: When an exit plan fails to meet our stringent criteria, we will divest our positions starting from January 1<sup>st</sup>, 2022.

To round out our policy addressing fossil fuels, we are currently working on an Oil & Gas policy that will allow us to continue engaging directly with companies in a way that challenges them to adopt better practices<sup>22</sup>.

Via this approach, we are effectively supporting their transition and contributing more comprehensively to their efforts to adopt low-carbon models.

Ultimately, contributing to tackling climate change impacts is not just about reducing carbon emissions: Ostrum AM, alongside a growing number of investors, believes that low-carbon transition must take into account other parameters, such as respect for biodiversity and the management of social impacts.

## Climate & Biodiversity Dependence

Since the signing of the Paris Agreement in 2015, signatory States have prioritized the fight against global warming.

While climate objectives must be a real priority for their action, they cannot conceal the consideration of other environmental objectives that are crucial to our ecosystem, such as the preservation of nature and biodiversity.

Biodiversity represents the other dimension of climate change: The loss of biodiversity over the last centuries has been occurring at an exceptional rate, and climate change, amongst other human pressures such as pollution and deforestation, was the main cause.

The fight against climate change has long been seen as equating to the preservation of biodiversity. In reality, this is not always the case, and some of the solutions put forward to combat global warming have a negative impact on biodiversity, such as biofuels: Their development on a massive scale has led to a change in land use to the detriment of biodiversity, and encourages the use of fertilizers and pesticides that contribute to soil and water pollution. The development of energy from biomass, another technology used as a replacement for more carbon-intensive technologies, also leads to defo-

restation, in addition to their carbon emissions resulting from burning wood.

The protection of forests, oceans and drinking water sources, as well as ecosystems, is a major source for concern. As we set out in the first part of this article, the Earth is undergoing its sixth mass extinction, and the loss of species has increased 100 times since 1900 according to the IPBES<sup>23</sup>. Biodiversity also affects essential economic reservoirs, such as Agriculture. According to a recent study by the WWF, doing nothing to stop the loss of ecosystems will cost at least \$479 billion a year globally, or nearly \$10,000 billion by 2050<sup>24</sup>.

Furthermore, preserving biodiversity strengthens the fight against climate change, as protecting forests is arguably one of the most effective actions to combat the increase in greenhouse gases in the atmosphere, in the absence of mature carbon sequestration technology.

Regulations are beginning to become increasingly binding in terms of biodiversity: If this challenge is not anticipated by companies and investors, it could lead to an increase in significant transition risks in the coming years.

In France, asset managers are required by regulation to ensure transparency on their incorporation of environmental, social and governance criteria and – among other aspects – they must take on board the ecological and energy transition (Article 224 of the French Grenelle II Act and Article 173 of the French Energy Transition for Green Growth Act). The Climate Energy Act of November 2019 amends Article 173, in conjunction with the EU Regulation on sustainability-related disclosures in the financial services sector (SFDR Regulation). Pursuant to these two texts, financial stakeholders will have to publish a sustainability risk policy (SFDR regulation), with an additional obligation for French companies to include details on the risks associated with climate change as well as the risks related to biodiversity in this policy.

European regulations encourage financial stakeholders to report biodiversity indicators:

- In the EU Taxonomy, this is one of the six environmental objectives: 'Protecting and restoring biodiversity and ecosystems'.
- In the SFDR, when an asset manager publishes the main negative impacts of its investments on the environment and other ESG dimensions, it must disclose at least one mandatory indicator relating to biodiversity: *'The share of investments in companies investing in sites located in/or close to biodiversity sensitive areas where the activities of these companies adversely affect these areas.'* Additional optional indicators are also foreseen.

Measuring biodiversity is a challenge for investors trying to deal with this issue. In fact, unlike the climate, it is more difficult to express targets for measuring the pre-

22. More information available on our website : <https://www.ostrum.com/fr/agir-en-tant-quinvestisseur-responsable> >>

23. Intergovernmental Science Policy Platform on Biodiversity and Ecosystem Services

24. [https://www.datapressepremium.com/rmdiff/2005445/Global\\_Futures\\_Summary\\_Report.pdf](https://www.datapressepremium.com/rmdiff/2005445/Global_Futures_Summary_Report.pdf)

servation or deterioration of biodiversity through a single indicator such as CO<sub>2</sub> emissions.

Data providers have developed biodiversity measurement indicators to respond to these different regulations, and sustainable finance stakeholders have started to invest in new valuation models i.e. the *Global Biodiversity* score, developed by *CDC Biodiversity*<sup>25</sup>, as well as the biodiversity footprint model developed by Iceberg data *Lab - I Care & Consult* on the initiative of several asset managers<sup>26, 27</sup>. These scores are expressed as an assessment of Mean Species Abundance (MSA), which links the economic activities (or company) to the main pressures it poses on biodiversity.

Although these models have some limitations, including the lack of raw data, they offer a clear and integrated view of the impact of companies and investments on biodiversity throughout their value chain. They also facilitate – among other things – efforts to identify the main sources of impact that support more targeted actions to reduce the biodiversity footprint.

Finance has a crucial role to play in protecting biodiversity. In addition to focusing on the most virtuous companies, engagement with companies staging their transition is an essential way for asset managers to help preserve biodiversity. It is about getting them to integrate biodiversity into their strategy and making sure they are aware of its importance to investors. At Ostrum AM, we have highlighted biodiversity as a priority area in our engagement policy, and we have set out our methodology for measuring the biodiversity footprint of the companies we invest in, in the near future.

## The inclusion of Just Transition

As early as 2015, the Paris Agreement included the “Just Transition” as a key element of the energy transition. This is defined as a transition that should be ambitious, relatively rapid, and fair: A complicated equation. Over the long term, many economists agree that the transition to a sustainable economy (i.e. resilient and low-carbon) will ensure stability and prosperity and will create employment. But in the medium term, the deployment of the energy transition will have social consequences that must be managed.

The time factor is decisive: The more the transition is planned and accompanied by measures to manage social impacts, the less painful it will be. A sudden transition, on the other hand, is very likely to produce very negative impacts from a social point of view: This is one of the main criticisms that major institutions address to the key sectors of the transitions, particularly the energy sector, which has been slow to develop transition strategies (and where strategies remain sometimes incomplete).

The energy transition is likely to result in unequal socio-economic impacts, varying from one country to another – depending on their degree of development and dependency on fossil energy – and depending on the type of economic activities/sectors. A report by the International Labour Organization (ILO), published in July 2019, states that, in the energy sector, 24 million new jobs could be created by 2030, if the right energy transition policies are put in place. But the study also predicts that 6 million jobs will be lost by 2030, due to the obsolescence of some businesses, including fossil fuel activities (oil extraction and refining, coal and electricity generation from coal)<sup>28</sup>.

Globally, the key sectors involved in the transition would currently account for almost 1.5 billion jobs, according to the secretariat of the United Nations Framework Convention on Climate Change (UNFCCC). This includes agriculture (1 billion), manufacturing (200 million), construction (110 million), transport (88 million) and energy (30 million). Identifying the impacts – positive and negative – generated by the transition is key to ensuring some form of stability and fighting systemic risk with the ensuing impact on the economy.

Another aspect of the issues related to the just transition is the development of energy prices, which have a huge impact on the pricing of other goods and services. As we highlighted in the first part of this paper, the energy transition already generates increased volatility in energy costs – and this trend is likely to step up – and thus lower purchasing power and social and economic issues in the chain.

Today the problem of the Just Transition is beginning to be tackled at the level of States and groupings of States. The ‘Fit for 55’ plan, which sets out in very concrete measures the ambitions of the European Union’s Green Deal, incorporates this concept. Indeed, the creation of the EU Green Deal was deeply influenced by the yellow jackets movement in France. In the ‘Fit for 55’ plan, the EU guarantees that the measures taken to transition to a low-carbon economy will be financed in such a way as to preserve the poorest segments of the population – this will be particularly the case for measures related to the energy renovation of buildings, financed partly by a solidarity fund of €72 billion.

In addition to this solidarity fund, the European Commission has created a Just Transition Fund of nearly €17.5 billion that will support energy transition in the most affected coal and carbon-intensive regions. The goal is to help the local workforce to acquire new qualifications, and support investments in clean energy, including technologies and infrastructure. According to the World Bank, Poland is set to be the largest recipient of the Just Transition Fund, with a proposed allocation of €3.5 billion<sup>29</sup>.

25. <https://www.cdc-biodiversite.fr/gbs/> (link in French)

26. <https://www.i-care-consult.com/2020/09/23/iceberg-data-lab-et-i-care-consult-selectionnes-pour-fournir-aux-investisseurs-un-premier-outil-de-mesure-dimpact-sur-la-biodiversite/> (link in French)

27. <https://icebergdata.com/>

28. [https://www.ilo.org/global/publications/books/WCMS\\_628654/lang--en/index.htm](https://www.ilo.org/global/publications/books/WCMS_628654/lang--en/index.htm)

29. <https://www.worldbank.org/en/news/press-release/2021/01/27/world-bank-and-european-commission-to-support-poland-to-transition-out-of-coal>

Investors can also support the Just Transition. This implies a minimum degree of dialogue with companies to encourage them to include the just transition in their climate strategy, taking into account essential issues related to the working conditions, the management of their suppliers, and the relationships they undertake with the local communities.

Ostrum AM has been a signatory to the UN PRI (Principles for Responsible Investment) since 2008. This commitment has prompted us to integrate social dimensions, incorporating both respect for human rights (and the adoption of a strict exclusion policy<sup>30</sup> for companies suffering from severe controversies with UN Global Compact principles) but also to integrate social elements into the qualitative analysis of the companies in which we invest. We use indicators related to the Just Transition to evaluate companies using our GREaT non-financial scoring model<sup>31</sup>, covering working conditions, supply chain, respect for the environment, job development and training, restructuring management, local development, and product supply.

In 2021, in addition to this set up, we formally set out our Engagement Policy, taking aspects of the Just Transition into account in our main areas for engagement: maintaining good relationships with staff, ensuring employees' and subcontractors' health and safety, guaranteeing human rights in supply chains, maintaining

strong relationships with local communities, and ensuring consumers' security and health. Our commitments are directly linked to the Sustainable Development Goals, in particular Goal 7 on the use of renewable energy, Goal 8 on access to decent jobs and Goal 10 on the reduction of inequalities.

In October 2021 we joined the Just Transition Coalition launched by Finance for Tomorrow. *'Bringing together managers and asset holders of the French financial ecosystem, in close contact with companies, the coalition aims to promote a socially acceptable transition to low carbon economies<sup>32</sup>'*. Specifically, through a direct commitment from companies, it aims to promote the integration of the 'Just Transition' into their environmental strategy, it facilitates the collaboration of investors and companies, and it promotes good practices in the sectors most affected by the environmental transition.

To conclude, fighting climate change is not just about transitioning to low-carbon business models, even if this first step is paramount. Ultimately, both companies and investors will have to develop their climate approach, integrating complementary aspects of biodiversity and just transition: Not only as regulations become more and more demanding, but also as taking into account these dimensions will ensure more stability, and ultimately greater prosperity for all<sup>33</sup>.



30. More information available on our website : <https://www.ostrum.com/fr/agir-en-tant-quinvestisseur-responsable> >>

31. LBPAM proprietary model

32. <https://financefortomorrow.com/en/just-transition/>

33. ESG integration refers to the inclusion of ESG issues in investment analysis and decisions. Approach to ESG integration varies based on the funds. ESG integration does not necessarily imply that investment vehicles also seek to generate a positive ESG impact.

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