

BROWN INDUSTRIES

The transition tightrope

April 2021



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A seat for everyone is necessary at the climate action table. Sustainable Finance will fail in its mission if it continues to confine high-emitting industries to the sidelines. The bespoke transition products for metals & mining, cement, oil & gas industries — simply to name a few examples — have just begun to emerge on the market. Nevertheless, it is where the largest GHG emissions abatement potential lies.

A carbon-constrained economy is the new prevailing socio-economic paradigm. However, and despite climate emergency, highly emitting companies cannot adapt overnight. During this “interim” and most likely “Darwinian” period, large-scale capital reallocation is required. Channeling financing flows, in a timely and orderly manner, is the *raison d’être* of the Sustainable Finance industry. It is unarguably the role a bank like Natixis wants to take, as demonstrated with our Green Weighting Factor (GWF).

There are significant market mismatches. On the one hand, there is a latent demand from investors to diversify their climate-change informed investments beyond “pure green” niches, on the other hand, there is a compelling necessity to kick-start brown industries’ deep decarbonization. Those two aisles are often too disconnected because of one can call “green puritanism”, which has sometimes turned into ostracism, but also wait-and-see attitudes driven by a fear of reputational backlash, and a lack of standardization.

Standardization is under way, but incomplete. The European Commission has begun to forge standards such as the European Taxonomy of economic sustainable activities. Nevertheless, as it is designed and calibrated in the Draft Delegated Acts, the EU

Taxonomy only defines what is “unambiguously green”. Doing so is vital to hamper greenwashing. Technical screening criteria and thresholds are accordingly set in a rather stringent manner. However, though attempting to identify transitioning activities and opening the door for further developments covering brown industries, the European Union still proceeds in a binary way, meaning an activity is either meeting or failing the substantial contribution criteria. Thereby, the entire classification might be barely actionable to spur transition pathways for the bulk of brown companies that are “in between” levels of performance.

In March 2021, the Platform on Sustainable Finance released several sound proposals such as “*a phase out trajectory from Significant Harm to improve in alignment with Substantial Contribution*” or allowing companies to count as taxonomy aligned investments towards meeting the technical screening criteria in the future. In the meantime, market practitioners, including Natixis, have elaborated a set of principles in order to frame the discussion and product development through the release of the ICMA’s Climate Transition Finance Handbook (December 2020).

The lion’s share of companies is far from being on track with what it takes to respect the Paris Agreement. The aforementioned ICMA’s Handbook explicitly refers to a business transformation contributing to the alignment with the goals of the Paris Agreement. Nonetheless, one acknowledges as a matter of fact — we can either deplore it or attempt to remediate it — that the bulk of companies are not currently aligned with a below 2°C trajectory.

Shaded transition approaches from dark brown to dark green are necessary. Nuances are necessary in sync with holistic analytical frameworks. This is the reason why Natixis has designed a 7-level scoring for its internal Climate Risk & Impact Weighted Adjustment tool, the Green Weighting Factor (GWF). Combined with granular and forward-looking analysis of our clients' transition potential, it helps us gradually shift our financing portfolios.

The present publication series “Transition Tightrope” was authored to create the content and analytical tools to draw and navigate these shades, including through our product design, market intelligence and outreach.

Offering our clients a 360° transition support. We believe transition is a matter of strategic dialogue with a company's management. There is a huge potential for new financing instruments tied to companies, financial institutions, or public entities' decarbonization targets. At Natixis, we are designing corporate-level financing instruments whereby entities put reputational and financial “skin in the game” vis-à-vis their transition targets achievement.

Transition does not mean dilution. An important disclaimer is that transition does not entail less integrity and looser efforts in our endeavor to fight climate change. It must not become the scrap yard of the Green Bonds Market. Accordingly, we continue to boldly support the development of Green Bonds, which are a powerful financing tool with high transparency and project finance-inspired impact features. However, transition is a different and complementary perspective, a more holistic and forward-looking layer of analysis. It often includes some pure green facets but is not limited to those.

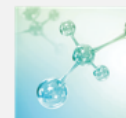
Transition finance is more of an entity level matter. Organization level financing with financial terms linked to tangible evidence of progress made in the transition process can be instrumental. When properly chosen and

calibrated, key performance indicators (KPIs) can be an excellent proxy and proof of transition through, for example, financial instruments with financial characteristics tied to the completion of scope 3 emission reduction targets.

Across all asset classes, tilting the cost of funding to sustainability performances will likely become the “new normal” within a decade. It started with loans before entering the bonds market and begins to be seen in LBO transactions. Transition-indexed or tilted features will probably thrive in M&A activities considering the non-organic radical changes required from incumbent companies that operate predominantly in fossil fuel-related sectors.

Regardless of the asset class and economic sector, in our advisory and structuring capacity, we put at the core-design of such financing or investment solutions disclosure, ambition, and accountability criteria.

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ACKNOWLEDGMENTS



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EXECUTIVE SUMMARY

TRANSITIONING BROWN INDUSTRIES

THE BIG PICTURE

WHAT?



High emitting brown industries
*accounting for more than 60% of global CO₂e emissions**



WHY?

Reputational risks
(boycott) & talent
attraction/retention
(human resources)

Operational &
market risks
(supply ≠ demand)
& opportunities
(strategic positioning)

Financial risks
(divestment, capital
adequacy ratio adjustment,
ESG mainstreaming)

Regulatory risks
(carbon pricing, climate
stress tests) & political
risks (foreclosures,
nationalizations)

HOW?

5 levers

Diversify activities &
products mixes
(e.g., renewables)

Quit/exit activities
most harmful to
climate (e.g., coal,
tar sands)

Offset GHG
emissions
(Capture Storage,
reforestation)

Decarbonize core &
hard-to-abate
activities

Provide
decarbonization
solutions

**Self-
decarbonization**
“greening of”

**Outbound
decarbonization**
“greening by”

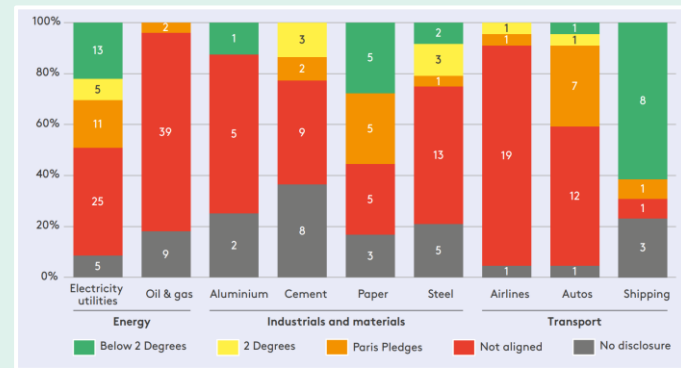
* Cement, Oil & Gas, iron & steel (IEA). Coal is excluded because it must be phased-out. Intensive agriculture could be included.



KEY TAKEAWAYS

- Our economies are predominantly “brown” (i.e., carbon emitting, predominantly relying on fossil fuels) and heading towards above 3°C temperature increase by the end of the century.
- Below 2°C temperature trajectories require tackling high emitting industries decarbonization. It is a matter of magnitude, scale & absolute emissions.
- The bulk of “brown companies” is unquestionably not aligned with the Paris goals while accounting for the lion’s share of emissions abatement potential.
- We therefore need to get investors’ portfolios & banks’ balance sheets “dirty” to clean up brown industries, in parallel of dramatically growing the pool of pure green assets and activities.
- “Transition” is an entity-level concept. Thus, eligibility at asset level is hard to determine. The proposed EU Taxonomy of sustainable activities (which is binary, an activity is either “in” or “out”, compliant or not) defined it at activity level in a stringent and aspirational manner (leading to risks of market niche).
- By contrast, a “shaded taxonomy” or intermediary levels (at least a medium brown taxonomy) would enable tracking and gradual but consistent transition pathways. Significant harm criteria are necessary.
- Entity-level forward looking & holistic financing instruments are suitable (Sustainability-linked instruments with wide scope indicators can offer a comprehensive picture of companies’ strategies).
- One walks the transition tightrope ahead: there is a balance to find between “transition leniency”, which accommodates minor improvements, and green ostracism, which excludes and deter efforts.
- There is a need for guidelines, safeguards and dedicated tools to decipher and steer transition strategies, and thereupon design financial products with high integrity (transparency & accountability).

FIGURE | Carbon Performance alignment with the Paris Agreement benchmarks by sector
(number and % of companies)



Source: [Transition Pathway Initiative \(2020\), State of the Transition](#)



INTRODUCTION

The drastic restrictions on ways of life to contain the COVID-19 have forced behavioral changes. They have had the unintended consequence of slowing economic growth, but also curbing GHG emissions. This is a stark fact that has demonstrated **how urgent and harsh measures are required to win the battle against climate change.** However, this sudden reduction in emissions comes at the cost of economic growth, massive job losses, falling incomes and profits, and worsened welfare outcomes for low-income groups. **We need a sustained drop in GHG emissions, not a year off.**

The endeavor to halt the climate change catastrophe is enormous, the task at-hand is disproportionately large, and **we are collectively running late.** Meanwhile, financial stability risks caused by climate change and a disorderly transition are under supervisors' radar surveillance. The real challenge lies in the **decisions that companies and financiers are going to adopt in the next five to ten years** because at the current emission rates, our carbon budget to limit global warming below 1.5°C is to be exhausted until then. The task is to **increase the preparedness and capital flexibility to at last** kick-start the transition and revert the decade-long increases of absolute emissions.

The heavily loaded regulatory agenda creates strong incentives to transition. Should it be through carbon pricing, whose coverage mechanisms are wider although price incentives remain too low, or contemplated capital requirement adjustments, **financing conditions for “transition laggards” could abruptly turn harsh and dry up.**

Some truths are painful to hear but **not all the companies are legitimate transition candidates, nor are all industries equal.** There is “corporate Darwinism” in high-emitting sector transition turmoil. Willingness is insufficient and we propose **criteria to differentiate activities that must disappear, shrink or transform.**

A disorderly transition scenario can be sparked by political events. The political uncertainty phase opened by the Brexit referendum or Donald Trump election in the U.S. has evidenced how fast and deep the unpredictable can occur. Very few have imagined a

25% tariff on Chinese goods while for years most of the OECD discussions were on non-tariff measures trade barrier. President Joe Biden's climate agenda is likely to be another upheaval*. If trade and ideological war escalated, carbon border adjustment mechanisms could pile-up¹.

“Nationalization” of transition laggards are possible in a world where the youth are taking to the streets to demonstrate against climate inaction. Millennials might use their ballots to push for bold or even demagogic climate change mitigation measures. The proliferation of net-zero emission targets by governments and businesses set by mid-century illustrates this momentum and panic (although remaining largely unsubstantiated).

This Report provides **individual entities with a business model change management toolkit to navigate transition macro turmoil.** Through different strategic levers — **exit, diversify, core-decarbonize, offset, provide solutions** — we have mapped out and assessed different companies' pathways and strategies.

Against this backdrop, the financial community is urged to engage in the decarbonization of **high emitting industries**, which are for the moment **largely ostracized from Sustainable Finance markets**, at least from an “explicit” and “dedicated” products or segments perspective.



¹ See our Report “U.S. 2020 Presidential Election. The Great divide. Opposing U.S. Climate Policy Available [here](#) and a most recent article “President Biden’s executive order “tackling the climate crisis” fleshes out his campaign promises on climate change”, [here](#).

Although necessary, the inclusion of brown industries in sustainable finance must be done scrupulously because of the **sensitivity of the concept of “transition”**. The latter is fraught with **carbon lock-in risks, business almost as usual changes and a bonanza of “transition washing” products**.

One does not want to open **Pandora’s box**. The debate around the place that ought to be devoted to brown industries has been hectic. **The label battle is fierce**, but we assert that what is at stake has far more reaching roots and consequences than branding. **Sui generis or ad hoc analytical tools and financing products** are imperative.

One refuses to twist or dilute the Green Bonds market in order to admit brown industries. The Use-of-Proceeds format developed for Green Bonds must be completed with additional formats to fully tackle the transition of brown companies, which is holistic and dynamic by its very nature.

We believe Sustainability-linked instruments are well-suited for transition purposes. Under specific conditions set in the marble of **ICMA’s Sustainability-linked Bonds Principles**, these instruments are result-oriented, forward-looking and all-embracing by design.

Our conviction is that transition assets exist but will often be subject to scrutiny as their benefits depend on the issuer’s backdrop, context and backward to forward-looking analysis. Context-based assessment of the benefits of Transition Use-of-Proceeds must be time-phased and geographically differentiated. As a result, we imagine the two formats as different and complementary perspectives under the “Climate Finance” umbrella.

There is what we call a **“transition tightrope”** in the sense that **we need to get our portfolios and balance sheets “dirty” to clean up the economy**, which remains predominantly “brown”. In the meantime, we must also acknowledge **the need for disruption**. The longer we accept gradual changes and leniently extend transition interim period, the more substantial and abrupt the necessary efforts of tomorrow will have to be.

We need both disruptive newcomers and radical changes from incumbents. Entire sectors of the economy are to undergo dramatic transformations. It has already started

within the Oil & Gas sector, perhaps the meat industry could be next. The meat sector is especially challenged owing to the **large bet made on negative emissions by most emitting industries**, which will require large surfaces of land for forestry activities, conflicting with animal husbandry’s need for land or biofuels for cars or aircrafts.

Timescale mismatches, transition paces, geographical divergences are the most challenging questions. Carbon net neutrality targets by mid-century are positive but remain toothless announcements without short-term implementation plans. One needs short and medium-term commitments serving as steppingstones for longer-term targets, intermediary milestones upon which company executives will be held accountable and rendering strategy credibility assessable.

The present publication is derived notably from an **extensive investors survey on the transition of brown industries**, which gathered the views of 75 respondents. It also benefits from the insights of 16 eminent leaders that shared their opinion on the “transition topic”. We thank them all for their contribution.

In a nutshell, this Report first **cleans the haze around the meaning of transition and proposes a definition**. It maps its arrival points and main features. Thereafter, it frames a business model and changes management analytical framework. As a result of our investigation, we have designed a **core product proposal which lies in transition-themed sustainability-linked instruments**. To frame the developments of such products, we propose guidance in the selection of KPIs and the calibration of their targets, as well as reporting tools.





01.

BROWN INDUSTRIES' TRANSITION

The elephant in the climate war room

Our definition of transition*

- The advent of steam engines, the uptake of the Internet, population ageing, urbanization, and climate change are megatrend examples, creating new paradigms to which most organizations ought to adapt.
- Reshuffling magnitude and ubiquity of changes are key evidence of ongoing socio-economic transitions

|| *By transition, we mean the interim period and process by which a company transforms its business model and activities to adapt to a new paradigm, in our case a carbon-constrained world.*

Transition is a forward-looking & holistic concept.

Cédric Merle

Head of Center of Expertise & Innovation,
Natixis Green & Sustainable Hub



* We further explain the concept of transition in this Report – especially in the Chapter 2 Unpacking the “transition box”, but it is useful at this stage to provide a preliminary definition



KEY TAKEAWAYS Chapter 1

It is crucial to **involve brown industries** in the fight against climate change because of their GHG emissions magnitude

Transition is not an option; it is “a matter of when”

Pressure to engage in meaningful transition pathways is arising from various stakeholders. The EU Taxonomy and similar initiatives worldwide try to set common languages & criteria to determine what activities, and/or under which conditions, are unambiguously green. Policymakers try to address legitimate green washing concerns and spur sustainable finance growth.

Regulatory responses are necessary and piling-up

Climate change-related policies are very diverse and range from emission standards (for cars or buildings) to explicit bans on technologies (plastic bags, fracking, pesticides), quotas (on water use, lottery for license plates auction), environmental-related taxes (on motor fuels, waste), tax differentiation or extended producer responsibility.

Timing & order are key for a successful transition

Going for easy-to-abate emissions first in the hope for immediate impact is necessary, but striving for long-term solutions in order to tackle hard-to-abate emissions and thus investing is even more pressing (e.g., R&D expenses are required to lower the cost of electrolyzers to mass-produce green hydrogen.)

Stranded assets & liability risks increase with more climate change related financial supervision

Credit rating agencies (CRAs) and financial supervisors start to integrate transition risks into their assessments. From capital requirements and central banks integrating climate change in their mandates, the regulatory and financial supervision landscape is evolving quickly to support an orderly low-carbon transition.

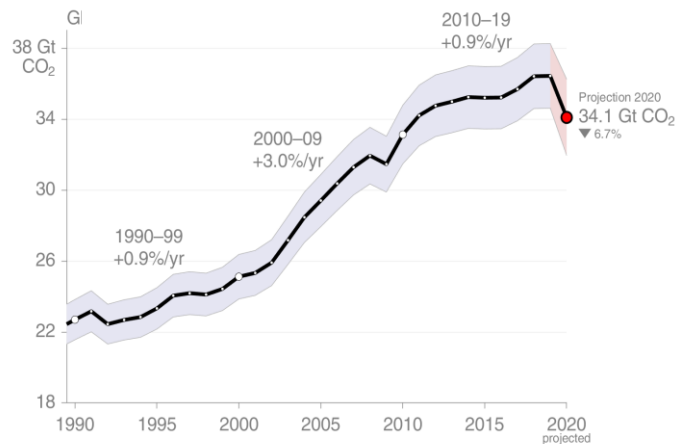
1.1 | A MATTER OF GHG EMISSIONS MAGNITUDE

A. CARBON BUDGET HIGH-SPEED EXHAUSTION

We are running desperately late in the fight against climate change

- Anthropogenic activities are already responsible for a rise of the average temperature of more than 1°C compared to pre-industrial times (before 1880).
- The Paris Agreement sets an objective to limit the rise in the average global temperature to well below 2°C above pre-industrial levels, and to pursue efforts to further cap the rise to 1.5°C.
- Nationally Determined Contributions (NDCs) of countries, if attained, would lead to a 3°C global warming, which is way beyond the targets agreed at the COP 21 in Paris in 2015.
- Five years after the Agreement entered into force, carbon emissions have kept increasing in absolute volumes, except in 2020 owing to the economic recession caused by the COVID-19 pandemic.

FIGURE | Global fossil CO₂ emissions (1990-2020, projection)

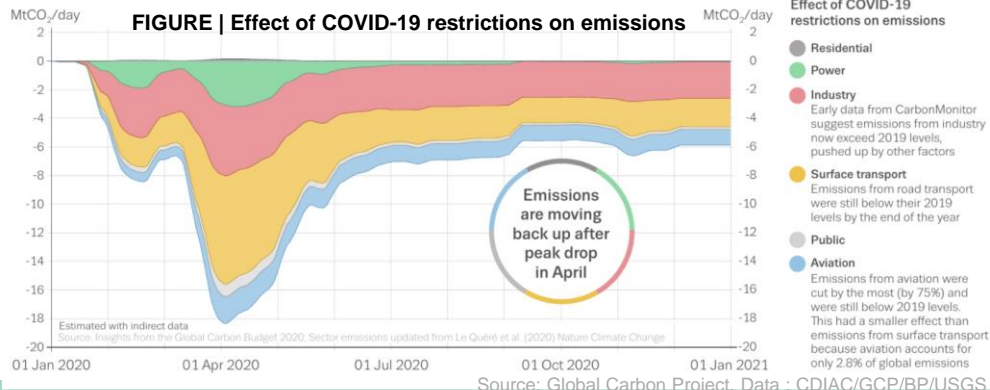


Source: Global Carbon Project, Data : CDIAC/GCP/BP/USGS

Global fossil CO₂ emissions have almost always increased and keep increasing

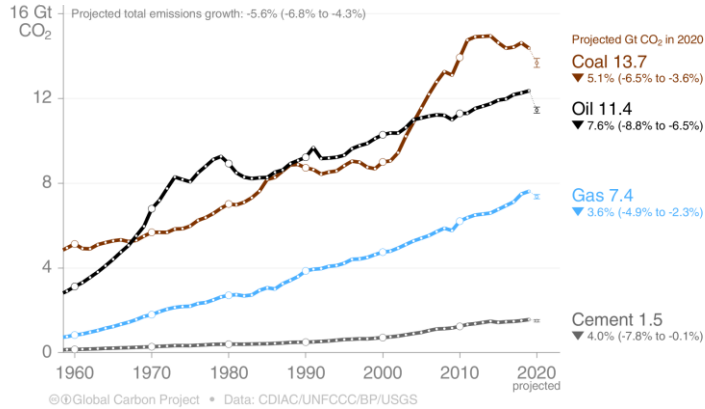
In 2019, global CO₂ emissions from fossil fuels reached around 36.4 GtCO₂. In 2020, these emissions are expected to decline approximately by 2.4 GtCO₂ (-6.7%), a record drop.

The emissions decrease caused by COVID-19 lockdown measures mostly came from road transport reduction (see the chart on the right).



Global CO₂ emissions are mainly due to fossil fuels...

Chart | Annual Fossil CO₂ Emissions: Global



Share of global fossil CO₂ emissions by source in 2019 (CO₂ represents 65% of total global GHG emissions)

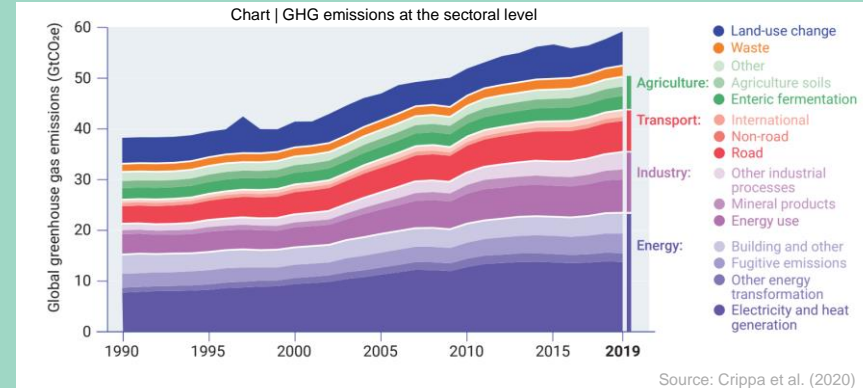
- Coal: 39%
- Oil: 33%
- Gas: 21%
- Cement: 4%
- Flaring: 1%

Source: Global Carbon Project

... and an economy-wide decarbonization is necessary

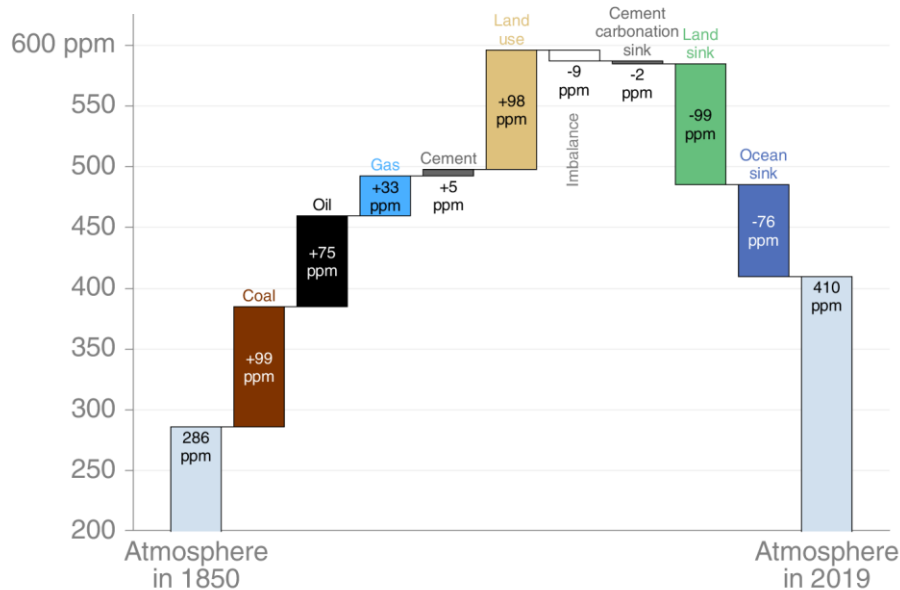
The inclusion of CH₄ and N₂O emissions highlights the ever-growing importance of the agriculture sector in emission trends (see the chart on the right).

Emissions are growing across all sectors, though there are signs that growth is slowing for electricity and heat generation due to a stronger growth in renewables and a decline in coal consumption.



A high-speed carbon budget exhaustion

FIGURE | The cumulative contributions to the global carbon budget from 1850 – sources and sinks of CO₂



© Global Carbon Project • Data: GCP/CDIAC/NOAA-ESRL/UNFCCC

TNB: the concentration of CO₂ in the atmosphere is expressed in parts per million (ppm)

The “carbon imbalance” represents the gap in our current understanding of sources & sinks

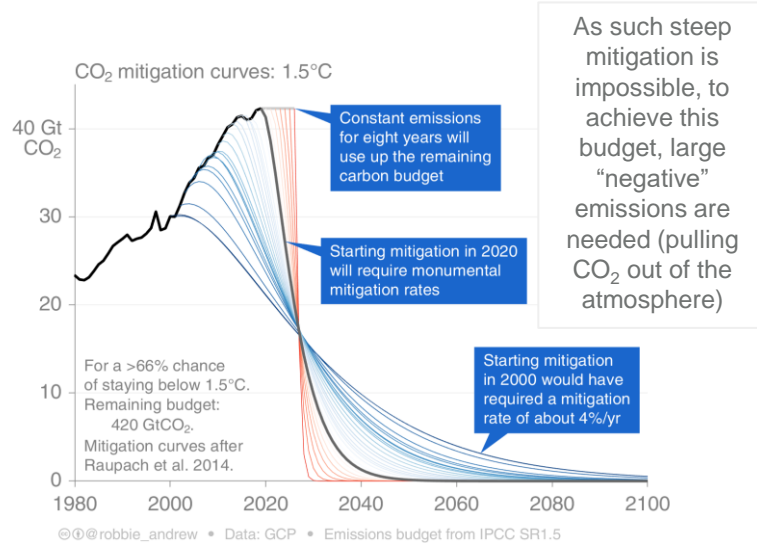
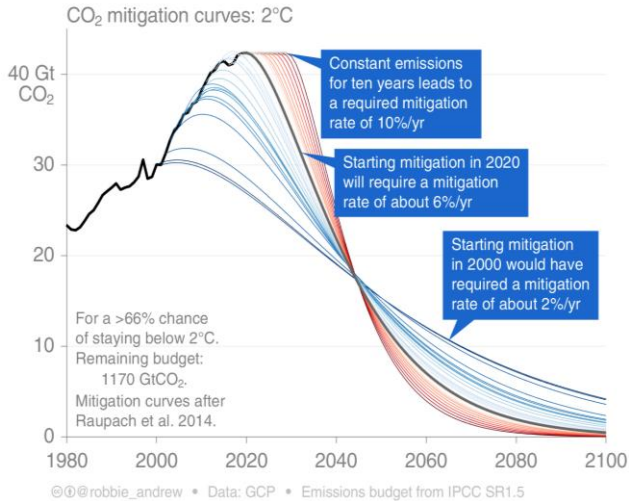
The budget imbalance is the carbon left after adding independent estimates for total emissions minus the atmospheric growth rate and estimates for the land and ocean carbon sinks using models constrained by observations

OCEAN SINK

CO₂ is indeed absorbed by oceans but that absorption capacity is limited, and CO₂ absorption increases ocean acidity, which can cause chain reactions (further info [here](#)).

Emissions must decline rapidly and abruptly

At the current rate of emissions, there are only 8 years of carbon budget left to meet the Paris targets.



As such steep mitigation is impossible, to achieve this budget, large “negative” emissions are needed (pulling CO₂ out of the atmosphere)

- At the current emission rate (+0.2°C per decade), global warming will reach 1.5°C around 2030
- The longer we delay mitigation, sharper will be the annual decarbonization required
- There is a gap between the overall target collectively agreed at the COP21 (“Well below 2°C”) and countries’ individual commitments (NDCs): the level of ambition of the current NDCs would lead to annual increase of GHG emissions until 2030 & cause a global warming of around 3°C by 2100.

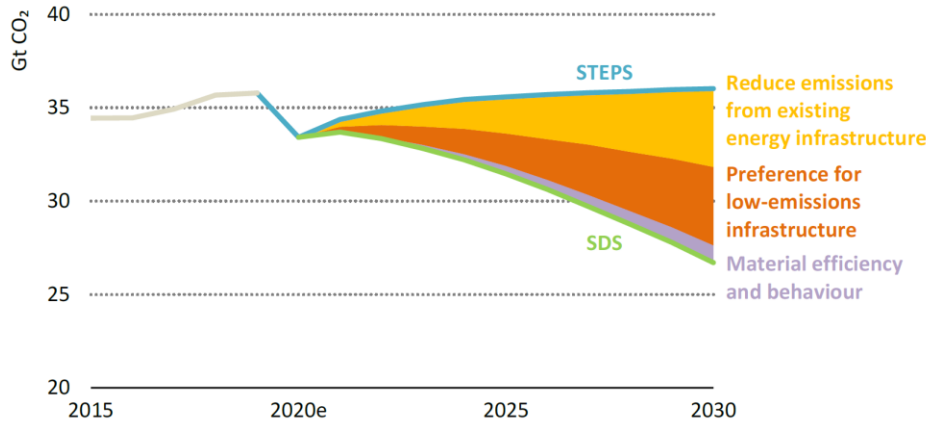
*IPCC, “Global Warming of 1.5°C”, with a “likely” range between 0.8°C and 1.2°C.

1.1 | A MATTER OF GHG EMISSIONS MAGNITUDE

B. THE GREATEST POTENTIAL FOR ABATEMENT LIES IN BROWN INDUSTRIES

- The world economy is predominantly brown; therefore, we need to get our hands dirty to clean up
- In 2030, measures to reduce emissions from existing assets are required to avoid 4.2 Gt CO₂ in annual emissions in the SDS scenario.

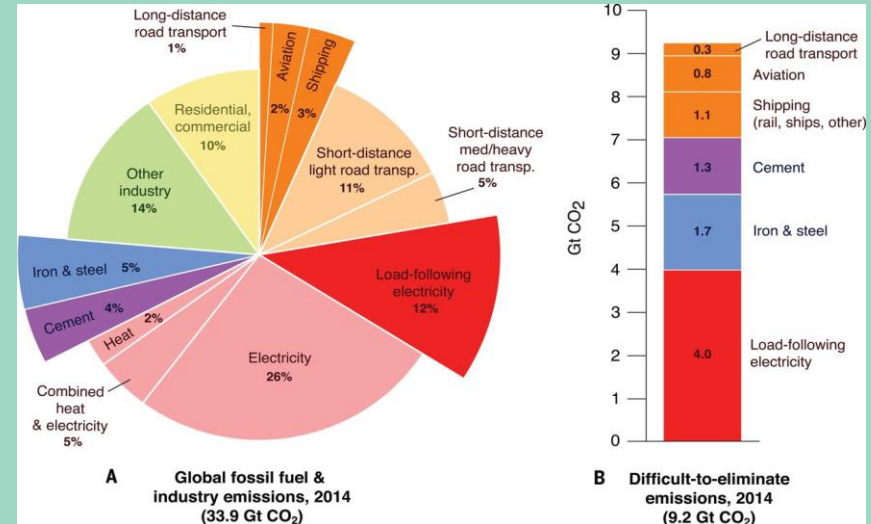
FIGURE | CO₂ reductions by measure in the Sustainable Development Scenario (SDS) relative to the Stated Policies Scenario (STEPS)



Source : IEA (2020), World Energy Outlook

A wide range of industrially scalable technologies & measures are needed for transition...

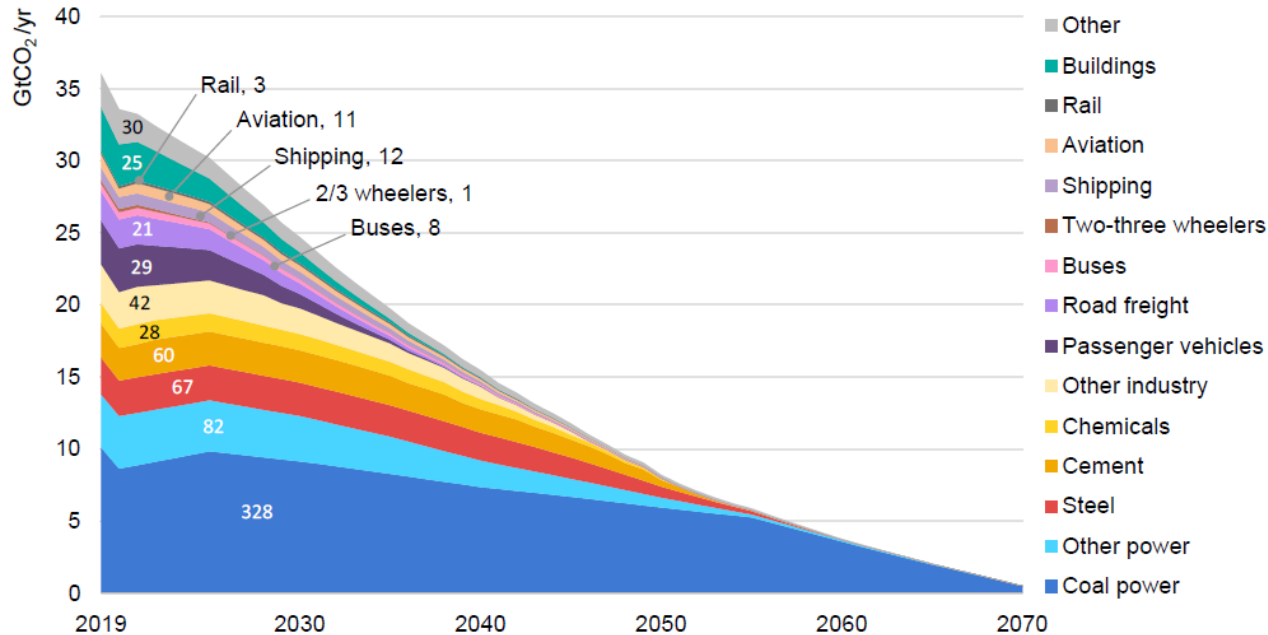
In the IEA's Sustainable Development Scenario (SDS), several means are deployed to reduce emissions from existing assets & infrastructure that would otherwise continue to operate as in the Stated Policies Scenario (STEPS) and avoid some of the locked-in emissions. For example, reducing the amount of output from existing coal-fired power plants by repurposing them to focus on providing flexibility by equipping existing plants with CCUS or co-firing with biomass, or retiring early if these options are not viable, are such options.



Source: The Energy Transitions Commission (2018), Mission Possible – Reaching net-zero carbon emissions from harder-to-abate sectors by mid-century

An economy-wide decarbonization is necessary

FIGURE | Global CO2 emissions reductions necessary by sub-sector (2019-70)



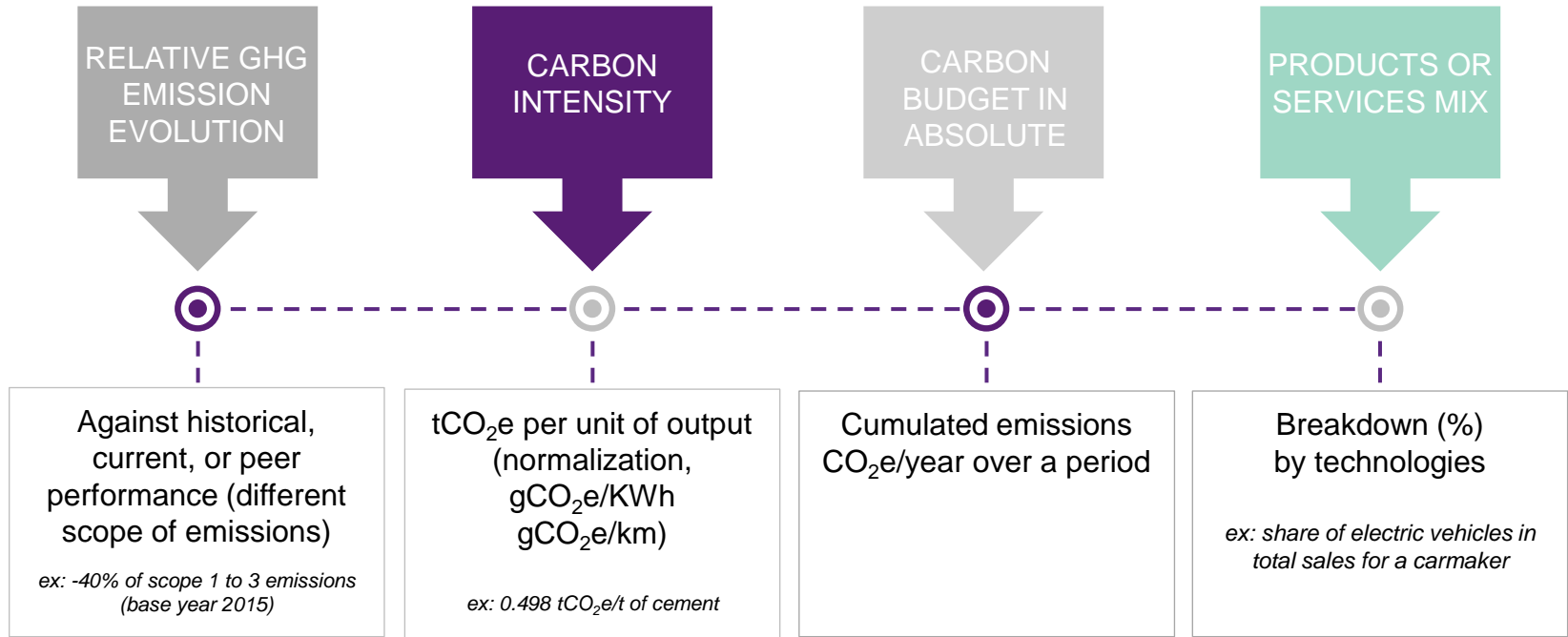
Source: IEA Energy Technology Perspectives 2020

- There is no single or simple solution to tackle climate change.
- Focusing on the power sector is not enough to reach climate goals
- About half of all CO₂ emissions today are from industry, transport and buildings.
- The contribution of industry to global energy-related CO₂ end-use emissions stood at one third in 2018.

1.1 | A MATTER OF GHG EMISSIONS MAGNITUDE

C. CLIMATE SCIENCE ALIGNMENT IS THE PREDOMINANT WAY BY WHICH TRANSITION IS ASSESSED

Means of assessment : 4 different “lenses” with different denominators



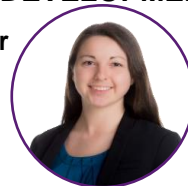
INTERVIEW

THE INSTRUMENTAL ROLE OF INDUSTRY DECARBONIZATION IN IEA'S SUSTAINABLE DEVELOPMENT SCENARIO



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What is the role of industry decarbonization in climate action?

*The contribution of industry to global energy-related CO₂ end-use emissions stood at one third in 2018 and this share is expected to increase in the IEA's Sustainable Development Scenario. **The majority of the overall emissions savings** (i.e., process and energy-related) **are from the production of cement, iron and steel and petrochemicals; energy-intensive industries that together account for around two-thirds of total industry sector CO₂ emissions today.***

How do you expect emissions savings will be achieved?

*There is no single or simple solution to reach these goals. Instead, a variety of technologies and policy measures need to be pushed to reach sustainability targets. **The largest near-term options are in energy efficiency, material efficiency and fuel switching.** [...] **Efficiency measures can make up 37% of the decarbonization potential of the Sustainable Development Scenario** compared to our baseline Stated Policies Scenario with efficiency standards for industrial motors for example. Fuel switching accounts for 28% of emissions reductions in industry.*

The WEO 2019 proposes an in-depth analysis of material efficiency's abatement potential. What are the key findings?

*Reducing demand for industrial goods through gains in material efficiency and material substitution is a key lever to bring down emissions in heavy industry. Cumulative to 2040, **we expect around 14% contribution of material efficiency to overall emissions saving** between Stated Policies and the Sustainable Development Scenario. **Yet the majority of savings come from systemic strategies across the energy sector** (IEA, Material efficiency in clean energy transitions, 2019). For example, in the Sustainable Development Scenario, iron and steel demand in 2050 is 15% less than in the Stated Policies Scenario as a result of strategies including lightweighting of cars and trucks and a lifetime extension for capital stock in the buildings ; in the chemicals sector, recycling reduces the need for virgin production of plastics (IEA, The Future of Petrochemicals, 2018).*

What role is CCUS meant to play for industrial decarbonization? At sub-industries level?

*Further into the future, carbon capture, utilization and storage (CCUS) becomes a viable and necessary option for industrial decarbonization [...]. **In the Sustainable Development Scenario, about 1 Gt CO₂ from the combustion of fossil fuels is captured in the industry sector in 2050, and a further 0.7 Gt from process-related emissions.***

[The full interview is available here](#)



1.2 | REGULATORY RESPONSES & LIMITATIONS TO AN ORDERLY TRANSITION

Overview of climate & environmental policies and instruments used by governments to encourage a low-carbon economy

To align consumers and producers' habits with climate policy objectives, governments usually resort to two broad categories of tools: **market or price signal-based instruments** (relying on economic or monetary incentives and signals) and **non-market-based instruments** ("command-and-control policies", involving the use of standards, regulations or quotas)

International trade

Trade rules can also be leveraged to incentivize positive climate actions. The general exception rules derived from the World Trade Organization could allow the use of trade-restrictive tools (penalties on fossil fuel subsidies, carbon border tax adjustments) when "*necessary to protect human, animal or plant life or health*" (WTO). When trading partners benefit from tariff preference (certain developing countries trading with the EU & the dedicated "General Scheme for Preferences" mechanism), it is possible for beneficiaries to exercise sustainable production when the tariff preference is an exception rule whereby positive climate production is incentivized.

Market or price signal-based instruments

- **Monetary or price signals that discourage the release of harmful pollutants & incentives the switch to cleaner technological alternatives or consumption/production patterns**
- Firms are incentivized to take mitigation action to the point where marginal abatement costs for all regulated firms are equal as opposed to command-and-control policies that restrict action to the defined standards.

Examples: Emissions trading schemes, marketable permits, taxes on undesirable products and services, subsidies to encourage the proliferation of technologies and specific consumption/production habits, and deposit-refund systems.

- These instruments present limits because of market mechanisms failure and/or too low-price signals and unintended social consequences. Often, exceptions are created for actors with political clout and lobbying capacities, which in the add complexity and undermine the goals pursued.

Market or price signal-based instruments

Instrument	Examples across different sectors (energy, electronics, agriculture, industry)
Emissions trading scheme Marketable Permits Climate-related product Service tax, charges & fees	Taxes on internal combustion engines fuels Water extraction levies Tradable water entitlements by separating water rights from land property rights (Australia) Carbon farming credits eligible to be used for emissions offsetting Emission quotas for cement manufacturers (EU ETS, Hubei ETS China) Carbon tax on cement production (South Africa, Canada, few provinces in Vietnam)
Tax & tariff differentiation	Exemptions on value added tax, tax rebates for EV purchase (Canada, Norway, Netherlands etc.) Introducing progressive taxes/ tariff blocs applicable to the consumption of high emitting goods and services Reducing the tariffs on low-emissions or efficient products Reduced VAT rates for products packaged with recycled plastic Tax on pesticides (Canada, Denmark, Norway) Tax on motor vehicle batteries and car tires (Bulgaria, Lithuania, Portugal) Tax/charges on plastic bags (South Africa, the UK, Finland etc.)
Deposit-refund systems (DRS)	Refundable deposits charged on hazardous or toxic packaging materials, drink containers and end-of life products Nickel-cadmium batteries collected and returned at the end of their use are paid for by the government (Denmark). Vehicle disposal charges paid by car buyers upon purchase of their vehicles are refunded to them as scrapping premium at the end of life of the vehicle (Sweden) Deposit refunds for plastic bottles or cash payments for their returns (Norway, Scotland)
Subsidies	Subsidies to support refurbishing of residential meeting efficiency standards (France, Germany, Switzerland) Subsidies for purchasers of electric vehicles (China, Austria etc.) Green direct payments to farmers who adopt carbon sequestration practices (EU)
Trade policies	Introduction of environmental clauses in trade agreements (CETA, export credit rules)

Non-market-based instruments (Command-and-control policies)

- It describes interventionism and situations where firms & consumers are obliged to **take up specific technologies or production processes to meet official standards**. It can also be through **bans** of certain products/technologies, or **mandatory progress information reporting requirements**.
- It is sometimes difficult to **properly delineate the boundaries of certain instruments** since governments may decide to apply a market-based tool and a regulatory standard to the same product or service.
- **Hybrid approaches have also emerged** (design of labelling schemes for certain products benchmarked against approved standards & voluntary approaches involving information disclosure, and extended producer responsibility to reward positive actors with social recognition).

DOWNSIDERS

- **Both instrument categories can be blind to social situations and undermine social justice** (as a result of inappropriate design for segments or groups of the society who lack the means to adapt to the desired behavior and/or to lobby policy-makers to get exemptions).
- Subsidies can lead to a **backfire by countering the policy objectives for other products & sectors** (e.g., overconsumption of water in farming communities driven by price protection for water intensive crop varieties).

REQUIREMENTS

- Policy makers are required to **adequately assess the costs & benefits, as well as second rank unintended consequences of measures** meant to facilitate the switch to sustainable patterns of production and consumption.
- **Clear and consistent messages** need to be sent to stakeholders so as not to fizzle out or delay investments.

Non-market based & hybrid instruments

Non-Market	Examples across different sectors (energy, electronics, agriculture, industry)
Performance standards & guidelines	Building energy efficiency requirement Standards (RT 2012 in France)
	Minimum light bulb efficiency (California, "U4E" United for efficiency lighting model regulation for developing countries)
	Meat consumption recommendations (guidelines issued in China in 2016 urge adults to eat just 40-75 grams of meat a day)
	Passenger car vehicles (EU threshold for car-makers with fines if violated: 95gCO ₂ e/km by 2021)
	Fuel quality standards (the EU Fuel Quality Directive (2009) for emission reduction targets)
Ban and/or restriction on technologies and/or practices	Ban on hydraulic fracking (Germany, the UK, Ireland, France)
	Ultra Low Emission Zones in London for cars, ban on ICE driving in cities (Oslo, Madrid, New York) & Ban on ICE buses purchasing for the forthcoming renewal of public transport fleets (France by 2025, Copenhagen, London, Berlin)
	Ban on single use plastics (China), outright ban of plastic bags (Mauritania, Morocco)
	Ban on new offshore oil and gas drilling off the Pacific, Atlantic and Florida gulf coasts (US)
	Curtailling intensive groundwater pumping for irrigation to prevent the depletion of aquifer and salinization of costal aquifers (Australia)
	Ban on burning of arable stubble to prevent CO ₂ emissions leaking from agricultural soil (England and Wales, China and parts of India)
	Ban of some pesticides & herbicides (Clothianidin & Roundup in France, Glyphosphate-based herbicides in Oman & Qatar etc.)
Quotas & Volumes measures	Capping the volume of certain inputs like nitrogen fertilizers and fertilizer budgeting (determining the required dose of fertilizer like in the EU)
	Licence plate lottery to buy new cars in some cities (Beijing)
	Regulating the volumes of groundwater used for irrigation (Israel)
	Fishing quotas in international waters (EU)
Hybrid	Examples across different sectors (energy, electronics, agriculture, industry)
Extended Producer Responsibility (EPR)	Manufacturers & importers of electrical and electronic goods should set up arrangements for the recovery & recycling of products sold after 2005 without cost consequences for consumers (EU Waste Electrical and Electronic Equipment Directive)
	Energy use and efficiency labelling of buildings, electrical and electronic appliances (fridges)
Information Disclosure	Nutri-score (FSA nutritional score)
	General Scheme for Preferences (EU)
Trade policies	Introduction of environmental clauses in trade agreements (CETA)



Hybrid instruments — Focus on France's credit export climate strategy

France's public import-export agency will apply a climate penalizing factor and a ban over its brown industries, and a climate supporting factor for green industries when approving export-oriented credit-insurances

Background about the instruments :

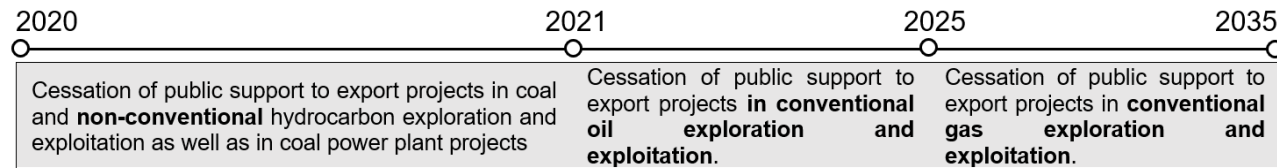
Public export guarantees are public policy tools used in **export finance**. Companies concerned are usually of strategic interest for industrial sovereignty: defense, naval construction and aeronautics represent 75% of credit insurance volumes in France. These French companies use export supporting mechanisms to win **public procurements**.

The French State, through **Bpifrance Assurance Export**, gives guarantees on financial operations in order to support exports. These guarantees consist in insurance contracts: the State assumes financial risks that lenders are not keen to assume because the loan is too big, the country is fraught with risks or due to market reasons.

 THIS PENALIZING-SUPPORTING MECHANISM ON A PUBLIC CREDIT-INSURANCE PORTFOLIO OF €40BN WILL IMPACT EXPORT PROJECT VIABILITY BASED ON THEIR ENVIRONMENTAL PERFORMANCE 

Progressively ending support for fossil fuel export projects...

France's public export agency will stop giving public guarantees to the following fossil fuel export projects:



Power plants increasing a **recipient country average power carbon intensity** will stop receiving public support unless they guarantee energy security (fair transition considerations), are strategic or coherent with the country's decarbonization.

...& rewarding sustainable export projects

On the other hand, incentivizing mechanisms will **reward sustainable projects based on the EU Taxonomy**:

- Stronger pre-financing
- More available resources (direct loans, better tariffs)
- Lower risk premium requirements for underwriting of sustainable projects

Source: French Directorate-General of the Treasury, (October 2020) Climate strategy for public export financing – Report to the Parliament. To go further, see our article "France's strategy on export financing: a stick and carrot approach with fossil fuels funding phasing out and a supporting factor for EU Taxonomy compliant activities", available [here](#).

Non-market based & hybrid instruments

Accounting for green and brown expenses in the budget: using the budget as a transitioning tool

What is green budgeting?

An **OECD initiative**, the “**Paris Collaborative on Green Budgeting**” was launched by its Secretary-General Angel Gurría during the 2017 *One Planet Summit*. The aim of “green budgeting” is to **weight how much harm and benefit a public budget creates on the environment**, through “**pure green**” budgetary programs but above all through “mainstream policies”. It aims at **breaking silos** across policies to track areas of improvement, identify priorities and **pinpoint inconsistencies**. Green budgeting consists in **tools and methodologies that assess and monitor the impact of public expenses on environmental objectives**.

Green budgeting initiatives

The Ministry of Economy and Finance of France released in September 2020 a **report on the environmental impact of the State budget** in the annexes of the 2021 Finance law proposal. This first report of its kind in France addresses the topic of “green budgeting”, a powerful “**accounting**” tool to identify “**brown public expenditures**” and monitor, steer and report on green public policies and more importantly on environmental costs and benefits of overall public policies.

How were brown expenses distinguished from green expenses in the French 2021 budget?

3	Very favourable: expense having a primary environmental objective or directly participating in the production of an environmental good or service.
2	Favourable: expense with no principal environmental objectif, but with a demonstrated indirect impact.
1	Favourable but controversial: expense having favorable impact on the short term but presenting a risk for the long term (like technological lock-in)
0	Neutral: no significant effect of the expense or unavailable data to determine the environmental impact
-1	Unfavourable: the expense has a direct negative impact on the environmental or encourages behaviors that are unfavourable to the environment.

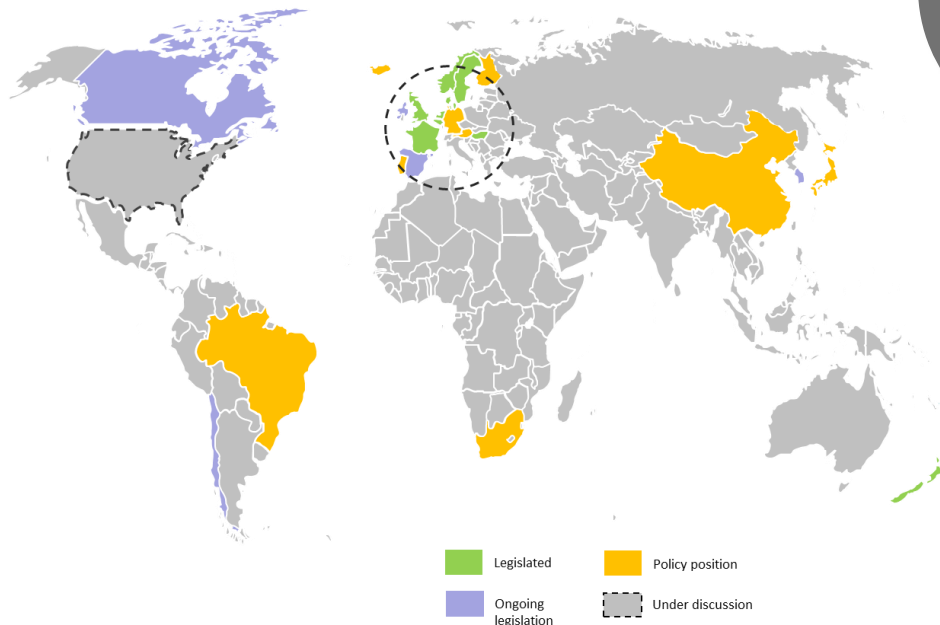
Breaking silos

- Like corporate climate strategy, budgetary governance must strike a combination of strategic planning, multi-annual envelopes and impact methodologies factoring environmental considerations.
- Greening budgetary frameworks and **identifying brown fiscal and budgetary expenses** can be a tool to identify eligible expenditures for green bond and design transition pathways for governments who become incentivized to reduce their **brown expenses**.
- Similar methodologies applied by corporates and brown industries provide a tool to direct CAPEX flows accordingly. Natixis has developed an internal mechanism that adjusts analytical capital allocation based on the degree of sustainability of each financing (see a presentation o the GWF in the last part).

Source: OECD (2018), Paris Collaborative on Green Budgeting, Ministère de l'économie des finances et de la relance (2020), *Rapport sur l'impact environnemental du budget de l'Etat*

Beyond specific instruments, countries adopt decarbonization targets, including net-zero strategies

MAP | Major countries with carbon or GHG neutrality targets in the world



Source : Natixis GSH, data as of November 2020

More than
110
Countries announced their intent to becoming carbon neutral between 2040 and 2060

These countries represent around
50%
of the world's GDP

These countries represent around
50%
of global CO₂ emissions

188
countries submitted their first NDCs

19
countries submitted an updated NDC

Net-zero emissions are achieved when anthropogenic emissions of greenhouse gases to the atmosphere are balanced by anthropogenic removals over a specified period. Details available [here](#).

Under the international [Paris Agreement](#), several countries have communicated their long-term strategy over a low-emission development pathway, notably through climate neutrality targets and Nationally Determined Contributions (“NDCs”) filled to the United Nations. NDCs are meant to be strengthened regularly as part of a “ratcheting ambition mechanism”.

Not all targets or carbon-neutrality announcements have the same weight and value. They vary according to their level of granularity and precision and their binding nature (i.e., whether they are political announcements by heads of State or governments, or bills voted by the Parliament. When such targets are enshrined in “hard law” and on the top of the hierarchy of laws, constitutional courts or administrative tribunals can censor infrastructure projects, contracts or budgetary laws in case of infringement.

[Link to a dedicated research on the topic](#)

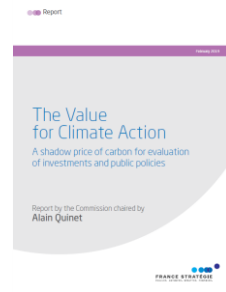


INTERVIEW

A SHADOW PRICE OF CARBON FOR A TIMELY AND ORDERLY TRANSITION



Alain Quinet
Deputy Chief Executive Officer,
SNCF Réseau



France Stratégie (February 2019)

Report by the Commission chaired by Alain Quinet
The Value for Climate Action - A shadow price of carbon for evaluation of investments and public policies.

[Available here](#)



“ The concept of carbon value is not exactly a synonym for carbon pricing. The carbon value trajectory aims at setting a socioeconomic value for GHG abating projects (so as to constitute a “green capital” to decarbonize our economy). It enables one to assess the climate value for the community of various actions or projects.

“ The concept of carbon value is not exactly a synonym for carbon pricing. The carbon value trajectory aims at setting a socioeconomic value for GHG abating projects (so as to constitute a “green capital” to decarbonize our economy). It enables one to assess the climate value for the community of various actions or projects.

“ Today, every economic sector must be tackled. Although the potential for GHG savings significantly varies from one sector to another, it does not mean that efforts on hard-to-abate sectors must be delayed. [Our success] will be largely determined by international cooperation and breakthrough technologies. ...international governance is nowhere more needed than for those [most carbon-intensive] sectors.

The France Stratégie’s Report identifies the value per ton of CO₂e abated to be factored into all economic actors’ decisions so that France achieves carbon neutrality by 2050.

They modelled the trajectory towards the “Net-Zero Emissions goal” and ended with the following time-bound targets:

Year	2018	2020	2030	2050
€/tCO ₂ e	54 €	87 €	250€	500€

[The full interview is available here](#)



The European Union's climate strategy

Policy Objective	Initiatives
The European Green Deal	<ul style="list-style-type: none"> • Communication on the European Green Deal; • European Climate Law enshrining the 2050 climate neutrality objective; • The European Climate Pact
Financing the sustainable transition	<ul style="list-style-type: none"> • European Green Deal Investment Plan; • Just Transition Fund • Renewed Sustainable Finance Strategy; • Review of the Non-Financial Reporting Directive
Commission contribution to COP26 in Glasgow	<ul style="list-style-type: none"> • 2030 Climate Target Plan • New EU Strategy on Adaption to Climate Change • New EU Forest Strategy
Sustainability of food systems	<ul style="list-style-type: none"> • “Farm to Fork” Strategy
Decarbonizing energy	<ul style="list-style-type: none"> • Strategy for smart sector integration • Renovation wave • Offshore renewable energy
Sustainable production & consumption	<ul style="list-style-type: none"> • New Circular Economy Action Plan • Empowering the consumer for the green transition
Protecting our environment	<ul style="list-style-type: none"> • EU Biodiversity Strategy for 2030 • 8th Environmental Action Programme • Chemicals strategy for sustainability
Sustainable and smart mobility	<ul style="list-style-type: none"> • Strategy for sustainable and smart mobility • ReFuelEU Aviation – Sustainable Aviation Fuels • FuelEU Maritime – Green European Maritime Space

Source: EU Commission



In December 2019, the European Union proposed the Green Deal, led by the Head of the European Commission, Ms Ursula Von Der Leyen.

The Green Deal aims at reaching “a fair and prosperous society” where economic growth is as much as possible decoupled from resource use.

In September 2020, several propositions have been defended by the European Commission and the European Parliament to strengthen the EU's climate strategy:

- To set a new EU target for 2030 of reducing GHG by at least 55% compared to levels in 1990
- To develop a GHG budget to ensure EU reaches the Paris agreement's climate goals
- To create an EU Climate Change Council (ECCC) as an independent scientific body to assess whether policy is consistent and to monitor progress
- To prohibit all direct and indirect fossil fuel subsidies by 2025 at the latest

Credit rating agencies to monitor transition risks

Transition risks arise from the transition to a low-carbon and climate-resilient economy

Policy risks: materialize as a result of stricter energy efficiency requirements, carbon-pricing mechanisms, or policies to encourage sustainable land use.

Legal risks: result from the risk of litigation for failing to avoid or minimize adverse impacts (lawsuits in courts) or failing to adapt to climate change.

Technology risks: occur when technology with a less harmful impact on the climate replaces a technology that is more damaging to the climate.

Market risks: stem from choices of consumers and business customers shift towards products and services that are less damaging to the climate.

Reputational risks: triggered by difficulty to attract and retain customers, employees, business partners and investors if a company has reputation for damaging the climate.



Credit rating agencies to monitor transition risks

Transition risks are declined in **three categories by the European Securities and Markets Authority (ESMA)**

([Technical advice on sustainability considerations in the credit rating market](#), July 2019)

1

Policy & legal risks

2

Technology risks

3

Market risk

Sustainability under ESMA's radars but not in favor of Regulation amendment yet

As a part of the European Commission's Action Plan for Sustainable Finance (March 2018), ESMA was asked to perform an analysis on credit rating's agencies (CRA) practices regarding sustainability considerations. ESMA calls on growing knowledge on how rating agencies "assess and manage relevant financial risks stemming from climate change, resource depletion, environmental degradation and social issues".

The ESMA distinguishes

ESG factors integration in credit ratings

(creditworthiness adjustment to ESG factors)

Sustainability assessments

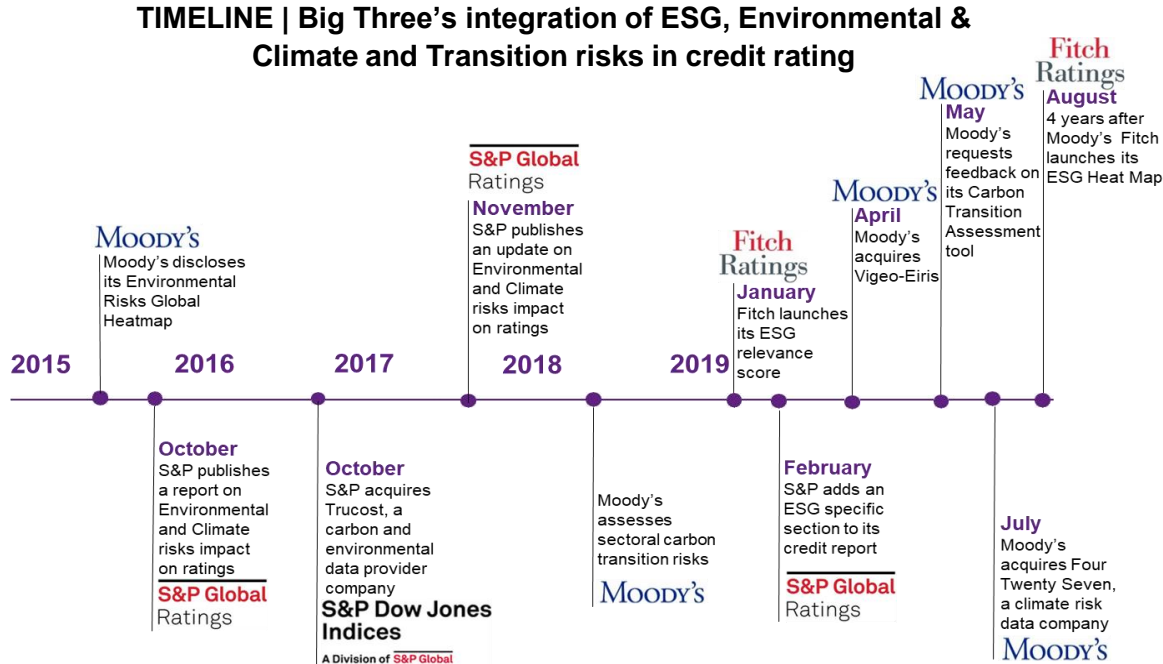
Providing an "opinion on the sustainability of an issuer or an entity"

The ESMA recommends strengthening transparency requirements on ESG integration CRAs' assessments and to "*update disclosure provisions, to provide a more consistent level of transparency around how CRAs are considering ESG factors in these assessments*" but does not advise amending the CRA regulation to include mandatory sustainability considerations in credit assessments.

Credit rating agencies to monitor transition risks

The market is ready & credit rating agencies start to reconsider their unique role as solely assessing credit worthiness.

For the big three credit rating agencies (S&P, Moody's and Fitch), **developing ESG/climate/carbon expertise is a strategic matter** to adapt to the market demand.

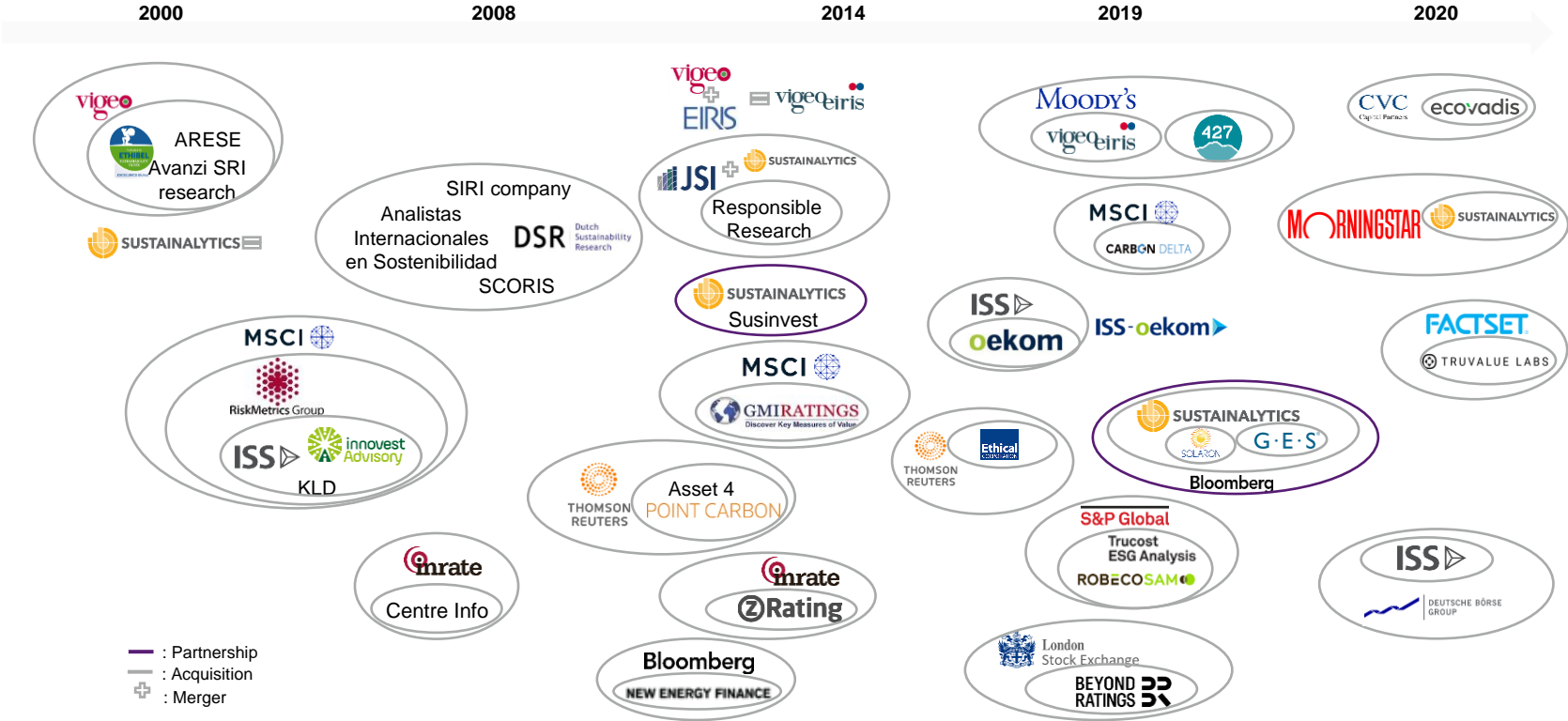


In 2019, Credit Rating Agencies delivered transparency across ESG assessment impact on credit ratings.

Fitch developed a sector based and entity-specific “ESG relevance score” applying to approximately 1,500 non-financial corporate ratings & demonstrating that 22% of corporate ratings were influenced by E,S or G factors.

In 2019, S&P announced the introduction of an ESG section to its credit rating assessments. This would cover 40% of the rated corporate universe in 2019 (around 2000 credits).

ESG Data: a sector reshaped by M&A transactions involving world leaders of market data & credit rating



Source: Companies reports, Green & Sustainable Hub, Natixis & AMF (2020), Provision of non-financial data: mapping of stakeholders, products and services

ESG Data: Overview of traditional ESG data providers

IDENTITY, PRODUCTS & SERVICES	ISS ESG	Sustainalytics	VIGEO-EIRIS	Covalence	Standard Ethics	INRATE	Ethos	Ecovadis	Ethifinance	Ideal Ratings	Trucost	SouthPole	CDP
Nationality	US	NL	FR	SWISS	UK	SWISS	SWISS	FR	FR	US	UK	SWISS	Supra (Germany/UK/US)
EU Operations	Yes	Yes	Yes	No	NO	No	No	Yes	Yes	No	Yes	Yes	Yes
Group	DBAG (Deutsche Börse acquisition in 2020)	Morningstar	Moody's						Qivalio		S&P		
Date of creation	1985	2008	2002	2001	2004	1995	1997	2007	2003	2006	2000	2006	2002
Business Intelligence													
Rating & Analysis/ Scoring													
Normative analysis													
Ranking													
Databases													
Sectoral/ethical exclusion													
Controversies													
Indexes													
Proxy voting													
Engagement													
Portfolio exposure/risks													
Asset management / Advisory													
Audit													
Evaluation of financing products (Green Bonds, etc.)													
Specialisation					Italy/solicited rating	Switzerland	Switzerland	Solicited Rating	SME/ Unlisted		Climate	Environment	Environment

Source: AMF (2020), Provision of non-financial data: mapping of stakeholders, products and services

ESG Data: Overview of ESG data provider new entrants

IDENTITY, PRODUCTS & SERVICES*	IHS Markit	MSCI ESG Research	L.S.E. (FTSE Russel/ Beyond ratings)	Refinitiv	Bloomberg	S&P (SAM)	CSR Hub	Arabesque	TruValue Labs	Impak	Owl Analytics	RepRisk
Type of player	Market	Market	Market	Market	Market	Market	Start-up	Start-up	Start-up	Start-up	Start-up	Tech start-up
Nationality	UK	US	UK/FR	UK	US	US	US	All	US	CND	US	Swiss
EU Operations	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No	No	Yes
Date of creation	2004			2018	1981	1995	2007	2013	2013	2016	2018	2006
Business Intelligence												
Rating & Analysis/ Scoring												
Normative analysis												
Databases												
Sectoral/ethical exclusion												
Controversies												
Indexes												
Ranking												
Proxy voting												
Engagement												
Portfolio exposure/risks												
Selection of investment universe												
Asset management Advisory												
Audit												
Evaluation of financing products (Green Bonds, etc.)												

*Definitions for each criteria are provided in the next slide.

Source: AMF (2020), Provision of non-financial data: mapping of stakeholders, products and services

ESG Data: Overview of ESG data provider new entrants

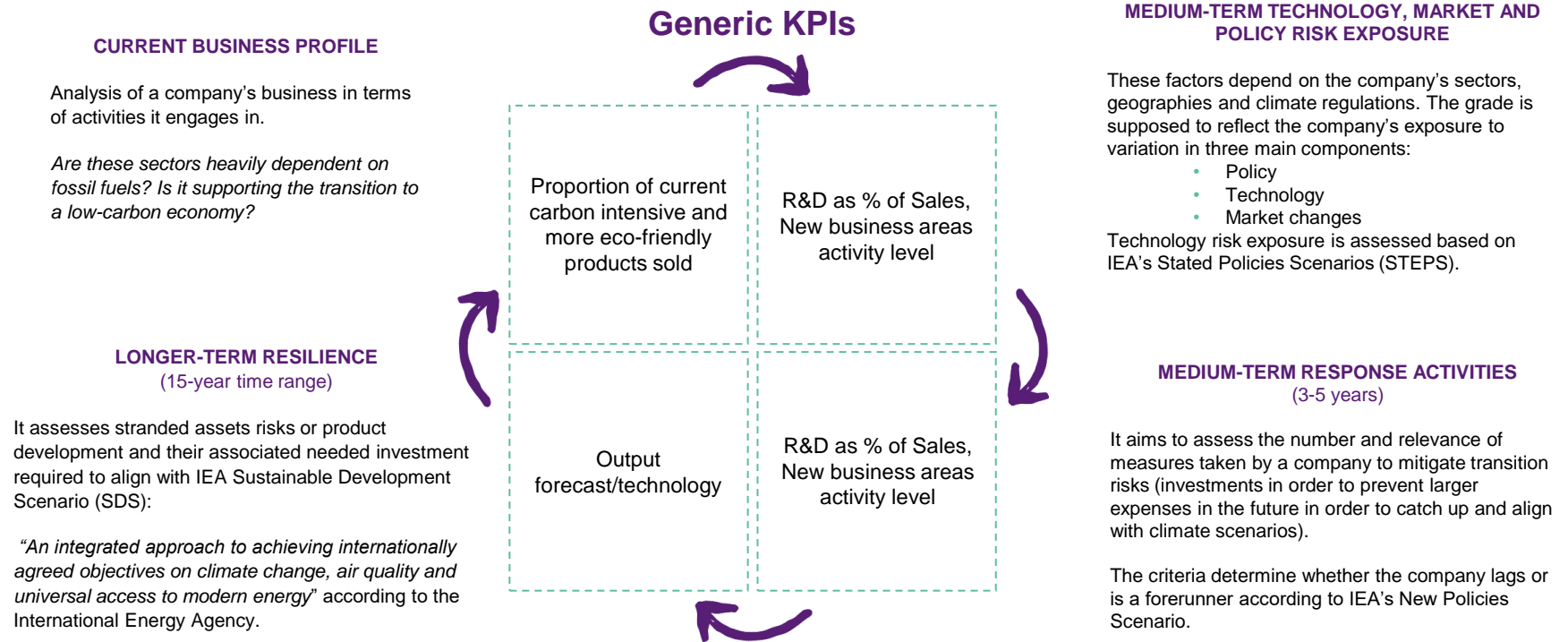
Product & services	Method/Service/Product	Description
Business Intelligence	Method	This activity consists in the production of structured knowledge in the form of information intelligence and analysis aimed at facilitating decision-making.
Rating & Analysis/ Scoring	Method & Product	Scoring and Rating to assess the exposure of rated companies to non-financial risks and the way in which these exposures are managed. Each of these ESG issues are associated with indicators, the number of which is also highly variable. The criteria for choosing these indicators is not always very explicit, as is the definition of the criteria themselves and their weighting in the evaluation. However, several eligibility factors are cited, such as the availability and comparability of data, as well as the relevance of the indicator to the issue at hand, which refers to the question of "materiality" (financial and/or holistic).
Normative analysis	Method	Normative analysis to assess to what extent companies comply with international standards and conventions, such as those issued by the International Labor Organization or the Universal Declaration of Human Rights. This service is provided by nearly all the traditional non-specialist ESG data providers but is not developed by the other market participants.
Databases	Product	Internal databases with varied collection processes : questionnaires sent to companies, use of information published by the entities concerned by the data or by trusted third parties (press agencies, non-governmental agencies), use of data produced by other suppliers of the sector through subscriptions or partnerships.
Sectoral/ethical exclusion	Method	Total or partial exclusion of sectors or businesses based on ethical, environmental or social considerations, such as tobacco, alcohol, gambling, weapons, etc.
Controversies	Method	Controversy tracking method to enable the monitoring of allegations and disputes affecting companies (and therefore their reputation and legal security) and, indirectly, the people linked to them. Controversies are generally classified according to their frequency of occurrence and level of severity. The answers provided by the companies are also identified. Data related to controversies are updated frequently (weekly or even daily). This service is offered by nearly all traditional non-specialist ESG data providers and market participants.
Indexes	Product	Financial product which is a set of securities designed to represent a particular market or strategy. Indexes are constructed and maintained with rules which ensure that security selection is objective and consistent. ESG indexes are distinguished from traditional broad market indexes by the introduction of ESG criteria into security selection.
Ranking	Method & Product	Method to compare and rank different types of assets according to a common scope or framework of ESG data.
Proxy voting	Service	Analysis of proxy voting history and current votes on shareholder resolutions.
Engagement	Service	Engagement is a dialogue between investors and companies focused on positively influencing corporate behaviors to drive long-term, sustainable returns for our clients.
Portfolio exposure/risks	Service & Product	Investors use portfolio analysis tools to assess the ESG risks of assets in a portfolio, based on extra-financial ratings, and to identify the best and worst performers by portfolio and/or ESG feature. This offering is often combined with an estimation of the carbon footprint of the funds. These services are offered by nearly all non-specialist ESG data providers and market participants.
Selection of investment universe	Method	The selection of an investment universe according to ESG criteria to improve the performance of the pool of assets.
Asset management Advisory	Service	The support of asset managers in a flexible and adequate way in their investment decision by integrating ESG data.
Audit	Service	Audit of the integration of ESG data into the financial structure with improvement advice.
Evaluation of financing products (Green Bonds, etc.)	Service	The evaluation or certification of financial products related to ESG issues based in particular on the implementation of international or national market standards. Example: Green Bonds with the role of Second Party Opinion for ESG agencies related to ICMA's Green Bonds Principles.

Source: AMF (2020), Provision of non-financial data: mapping of stakeholders, products and services

Credit rating agencies to monitor transition risks

FIGURE | Illustration of methodologies with Moody's Carbon Transition assessment (CTA) methodology

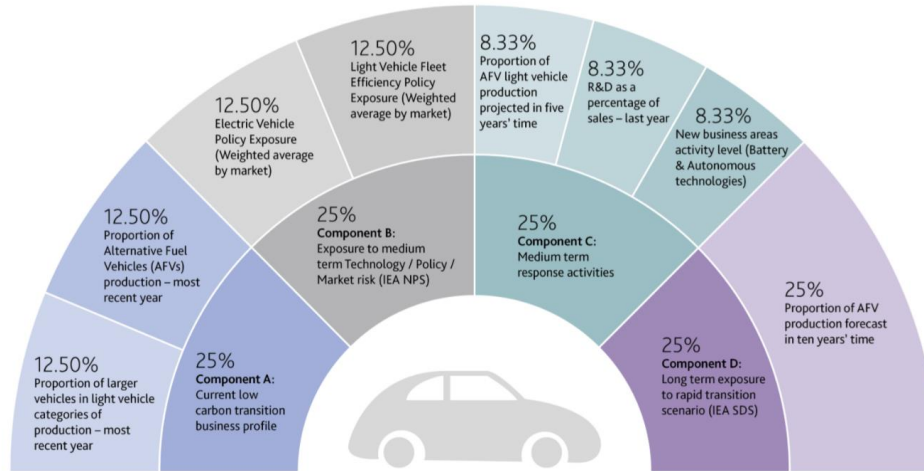
See Moody's [CTA methodology](#) to assess carbon transition risks for rated companies (Sept 2019)



Credit rating agencies to monitor transition risks

Focus on Moody's Carbon Transition assessment (CTA) methodology

FIGURE | Factors considered by Moody's when assessing carbon transition risk for automakers
Components and weightings of transition assessment factors



According to Moody's, heavy industries are being reshaped by environmental & social forces.

In 2019, this segment comprises automotive manufacturers (\$516 billion), unregulated utilities and power companies (\$501 billion), commodity chemicals (\$119 billion), and coal mining and coal terminals (\$19 billion).

*“The interplay between environmental and social forces will have a **transformative impact on the credit quality of these sectors** and will likely translate into **balance sheet and/or business model realignment for industry players**”.*

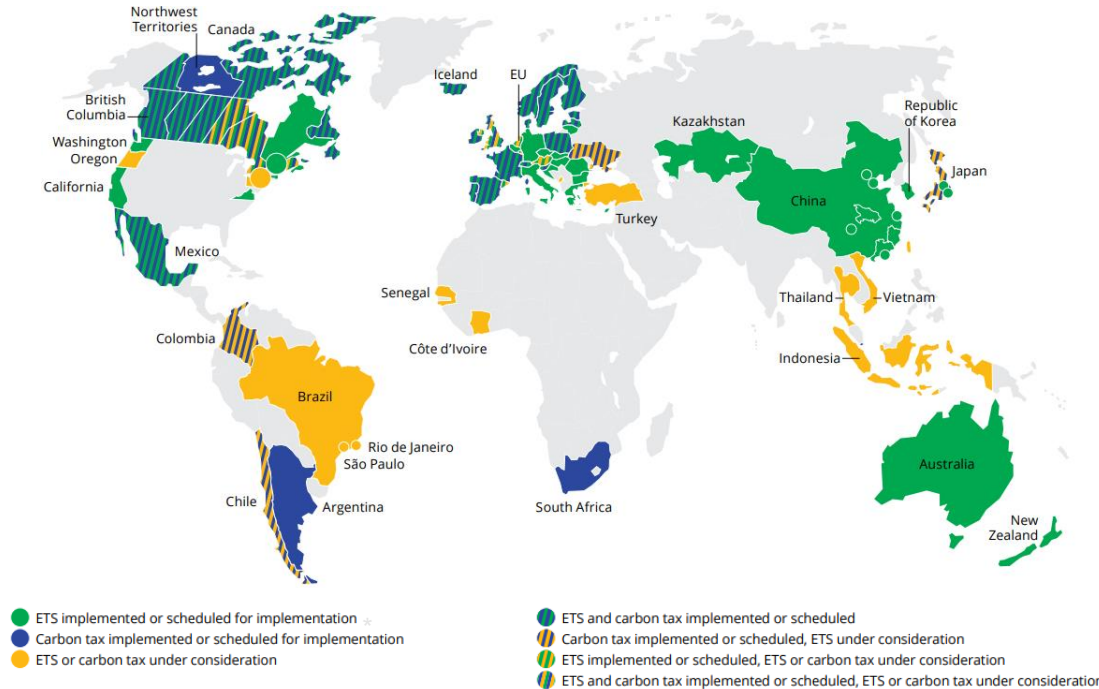
“As a result of stricter fuel efficiency standards and expectations of a gradual change in consumer preferences, the automotive sector is undergoing a fundamental shift away from traditional combustion-engine vehicles towards electrified powertrains and self-driving technologies”

- Moody's

Source: Moody's Investors Service (November 2019), Automotive manufacturing – Global: Substantial variation exists in automakers' carbon transition risk profiles

Carbon Pricing on the rise

MAP | Summary map of regional, national and subnational carbon pricing initiatives



* NB: ETS above not only refers to cap-and-trade systems, but also baseline-and-credit systems as seen in British Columbia and baseline-and-offset systems as seen in Australia.

Sources: World Bank Carbon Pricing Dashboard & State and Trends of Carbon Pricing 2019

Carbon pricing is theoretically one of the most flexible and least costly tools to propel the world into a low-carbon development pathway.

It attempts to put a price on the externalities of GHG emissions and shift the cost to those responsible for it by:

- Incorporating climate change costs into economic decision making
- Creating an incentive to lower GHG emissions

Several **significant emitters** (Canada, the EU and China) **have their own carbon pricing initiatives.**

However, some **major economies are still missing from the picture** (the U.S, Russia and India).

Despite the absence of national coordination for carbon pricing in the US, a few States accounting for more than a quarter of the national population have set up the **Regional Greenhouse Gas Initiative (RGGI)**, a form of Emission Trading Systems (“ETS”) that focuses on the power sector.

Carbon Pricing on the rise

The two main ways to put a price on carbon emissions are **emission trading systems (“ETS”)** and **carbon taxes**

Emission Trading Systems (“ETS”) or cap-and-trade system

ETS set limits on the total amount of GHG that can be emitted

- Companies are allocated carbon allowances that can be traded in the market. A company that emits more than what it is allocated can purchase allowances, and *vice versa* while a company that emitted less can sell its remaining allowances.
- The **market mechanism sets a price for carbon emissions** and trading enables emission reductions to occur where it is the most cost effective to do so

Example:

The EU ETS today covers more than 11,000 energy-intensive installations, including power plants, manufacturers and aircraft operators. Companies must have enough allowances to cover their emissions or pay penalties. Currently, the EU ETS covers about 45% of EU GHG emissions and is the largest carbon market to date.

China plans to implement an ETS, which has the potential to surpass the EU ETS in terms of the amount volume of GHG covered.

Carbon taxes

Carbon taxes are pre-determined prices or taxes on GHG emissions

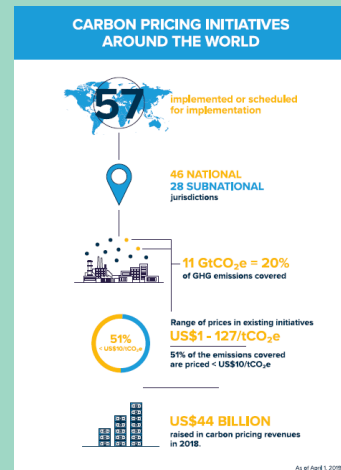
- The price **of carbon is fixed**, while the amount of emissions reduction is less predictable
- The tax rate can be progressively raised to reflect increasing ambition

Example:

Canada has a federal “fuel charge” which taxes fossil fuels at a rate of \$20/tCO₂e in 2019 and expected to rise annually by \$10/t until \$50/t in 2022.

There are several carbon pricing schemes implemented / scheduled for implementation.

Sources: EC Europa, EU Emissions Trading System (EU ETS), Government of Canada, Fuel charge rates, The world Bank (2020), [Carbon Pricing Dashboard](#)



Progress on the implementation of carbon pricing initiatives has been encouraging, reflecting the growing worldwide consensus that unrestricted carbon emissions and climate change are pressing issues. In 2020, initiatives implemented or scheduled for implementation would reach 22,3% of global emissions (12 GtCO₂e). Ten years ago, they were concentrated in Europe and barely covered 5% of global GHG emissions.

Carbon pricing is on the rise...

- **Existing carbon prices schemes are sometimes criticized for having too modest prices.** Less than 5% of global emissions covered under carbon pricing initiatives are priced at *"a level consistent with achieving the goals of the Paris Agreement"*.
- Global carbon prices must increase to keep global warming below 2°C despite the **limitations around the political and social acceptability despite social and political reluctances.**
- **Well-planned and progressive increases in carbon pricing** are needed for the sake of a timely and orderly transition, and to create **preparedness and acceptability.**
- There are **limitations to what a carbon price alone can do.** Various models reveal that **carbon prices tend to affect predominantly the electricity sector**, accounting for over 70% of the anticipated emission reductions.

...but tends to be insufficient





02.

UNPACKING THE “TRANSITION BOX”



KEY TAKEAWAYS Chapter 2

Our definition of transition

“The interim period and process by which a company transforms its business model and activities to adapt to a new paradigm, in our case, a carbon-constrained world”.

Transition actions could have undesirable consequences

Some of the unintended consequences of insufficient efforts include **carbon lock-in** (CO₂e emissions locked into an asset lifetime), **rebound effects** (intensity reduction not necessarily leading to absolute reductions), and **low-integrity** or a bonanza of **“transition washing products”**.

Societal issues must be embedded into transition schemes

A “fair transition” seeks to ensure that substantial benefits of a transition are shared widely, while also supporting economically vulnerable countries, regions, industries, communities, workers and consumers.

All brown companies are not equal

One distinguishes between:

- i. **Replaceable activities:** inputs & production processes can be substituted to significantly reduce GHG emissions
- ii. **Irreplaceable activities:** cleaner alternatives are non-existent or cannot be adopted at scale as of yet (technological or cost constraints).

Companies belonging to brown sectors could either **transform**, **shrink** or **shut down**. However, criteria determining the “replaceability” of economic activities remain difficult to define.

2.1 | SEMANTICS TO CLEAN THE HAZE



TRANSITION IS NOT

- Micro: about assets, projects or facilities *per se*
- Slight & marginal improvements or trivial changes
- Static capture of past and/or current performances
- The trash or scrap yard of green finance instruments (“2nd division”)



TRANSITION IS

- Holistic: about entities and consistency of their disparate actions
- An interim period towards new business models fit to cope with a carbon constrained-economy (a new paradigm)
- Dynamic, process or pathway (forward looking), iteration
- Willingness, capacities, disclosure, shareholder dialogue & accountability
- Efforts to be on track (R&D, CAPEX, OPEX), governance and incentives

Definition of transitional activities in the EU Taxonomy Regulation (2020/852)



“Economic activities and sectors for which there are **no technologically and economically feasible low-carbon alternatives**. Those transitional economic activities should qualify as contributing substantially to climate change mitigation **if their greenhouse gas emissions are substantially lower than the sector or industry average**, they **do not hamper the development and deployment of low-carbon alternatives** and they **do not lead to a lock-in** of assets incompatible with the objective of climate neutrality, considering the economic lifetime of those assets.

The technical screening criteria for such transitional economic activities should ensure that those transitional activities **have a credible path towards climate-neutrality** and should be **adjusted accordingly at regular intervals**”.

Transition etymology & meaning analysis

A dynamic and holistic concept

Definition of “transition”

Etymologically, “transition” comes from the Latin word “*transitionem*”, (nominative *transitio*) meaning “a going across or over”.

In contemporary usage, dictionaries define it as a “*temporary phase*” and “*switch or changeover from one state of things or condition to another*”.

By transition, we mean: **“the interim period and process by which a company transforms its business model and activities to adapt to a new paradigm, in our case a carbon-constrained world”**

- Transition should not be mistaken for its arrival point or end-goals (for instance, carbon net neutrality or climate temperature scenarios alignment).
- It refers to the time-bound pathway(s) to get there (forward-looking notion) and relates to the fundamental and inevitable transformation undertaken by an entity to become resilient to a new set of overarching conditions.
- Transition is a holistic notion, thereby a car or a plant, or any asset, cannot *per se* be in transition. Identified assets or projects can only at best serve the transition of the whole entity they relate or belong to.
- All-embracing analysis or strategic tools are necessary to capture transition dynamics.



Transition etymology & meaning analysis

...with demanding implications

Transition is poised to have deeply rooted and far-reaching consequences upon the identity and capital stock of the organization, both tangible and intangible, including workforce skills.

Capital flexibility of companies is crucial. If transition is over delayed, it turns abrupt and less intentional, with higher sunk costs and value destruction.

Most of the time, transition is not a positive-sum game, there are winners and losers, across and within economic sectors.

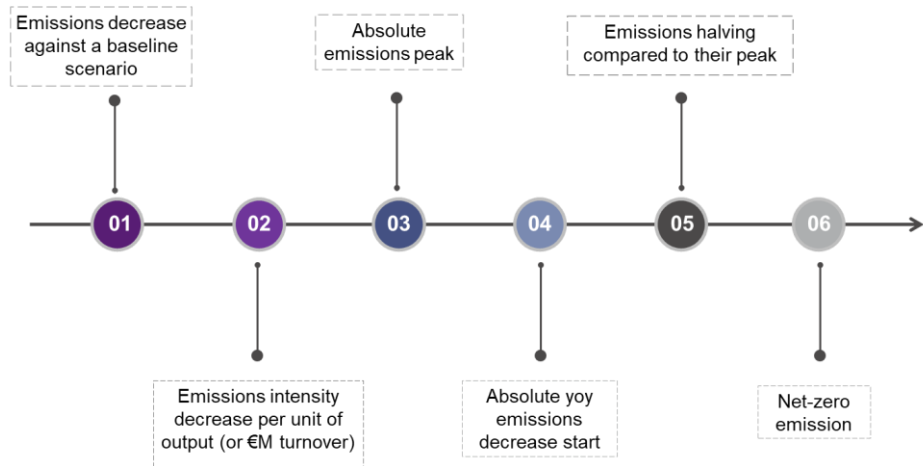
The extent to which a company needs to completely reinvent itself depends on its legacy and current performance.

In some cases, it might be a burden, meaning the transition battle is already lost.

Transition spans over significant periods of time. Usually, it does not follow a linear pace and must be **timely & orderly** (neither too late nor too early, as first movers could suffer from unfair level playing field and competitive disadvantage).

Transition is a dynamic process and needs to be regularly updated. There is no single trajectory to complete it. **Far-sighted vision** from top management and **flexibility** to adjust are equally necessary.

Planning is critical to deal with the mismatch between the operating timescale of persons in responsibility and the delivery target.





Guillaume Neveux
Founding Partner
I Care & Consult



The notions of pathway and dynamic are key: climate transition will not occur overnight but in a “transition window” of 10-20 years.

We developed a three-step process to help companies turn the “2°C alignment” concept into an operational action. First, we perform a 2°C stress test to reveal financial risks and opportunities of climate scenarios. Second, we define an ambitious 1.5°C trajectory in line with stakeholders’ requirements such as SBTi. Third, we build a bottom-up GHG reduction action plan to match this trajectory based on necessary levers to be implemented in the next 5-15 years.

*Often, we adopt a Life Cycle Analysis (LCA) approach while assessing activities. **We then combine the two perspectives: the alignment of the company’s own activities such as energy efficiency and the alignment of the markets where the company is present.***

*What we consider as an ambitious transition strategy for an oil & gas company is **to transform its oil & gas business into a “global energy” business.** It requires the company to reorient its pure fossil fuel and high carbon intensive portfolio to a more balanced portfolio that consist of no coal, less oil, more gas, and of course, renewable energy such as biomass and low carbon electricity.*

***Each sector has its specific role in the climate transition** and every company, no matter which sector it comes from, can become 2°C aligned if it reduces its carbon footprint enough.*

[The full interview is available here](#)




2.2 | ARE BROWN COMPANIES ALL EQUAL?

The concept of “replaceability”

A characteristic intrinsic to the nature or purpose of an economic activity

TABLES | GICS classification of high and low stakes sectors

High climate impact	Low climate impact	The EU Taxonomy Draft Delegated Acts define a list of “transitional activities”	
<ul style="list-style-type: none"> • Energy equipment's & services • Oil, gas & consumable fuels • Chemicals • Construction materials • Containers & packaging • Metals & mining • Paper & Forest products • Capital goods • Transportation • Automobiles and components • Food beverage and tobacco • Real estate • Semiconductors & Semiconductor equipment • Technology Hardware & equipment utilities 	<ul style="list-style-type: none"> • Commercial and professional services • Consumer durables & apparel • Consumer services • Food & staples retailing • Health care equipment and services • Household & personal products • Media & entertainment • Pharmaceuticals biotechnology & life sciences • Retailing • Software & services • Telecommunication services • Banks • Diversified financials • Insurance 	 <ul style="list-style-type: none"> • Growing of perennial crops • Livestock production • Manufacture of cement • Manufacture of aluminum • Manufacture of iron and steel • Manufacture of hydrogen • Manufacture of chlorine • Manufacture of anhydrous ammonia • Manufacture of nitric acid • Manufacture of plastics in primary form • Manufacture of biogas and biofuels for use in transport • Transport by motorbikes, passenger cars and light commercial vehicles • Freight transport services by road • Inland freight water transport • Sea and coastal freight water transport 	

- Official and/or market agreed classifications are needed to determine exactly what “brown industries” are.

- The Technical Expert Group (TEG), in its recommendations on the EU Climate Transition Benchmark and EU Paris Aligned Benchmark, sought to avoid greenwashing risk, consisting of underweighting high-intensity sectors.

- It therefore proposed a constraint on sector allocation: compared to investment universe, exposure to high stake sectors must be equal or greater. The TEG suggested to use classification such as the Global Industrial Classification System (GICS).

The concept of “replaceability”

... defining the prospect of economic sectors in a low-carbon economy

Two categories of brown activities

Replaceable Activities

Industries whose inputs and production processes can be relatively substituted to significantly reduce GHG emissions.

An example is electricity generation where low-emitting sources like wind and solar can, to some extent, be relied on for power generation as opposed to fossil fuel sources, such as coal (although base load feature is key).

Irreplaceable Activities

Industries whose inputs and production processes can be incrementally improved to significantly reduce the GHG emissions emanating from their activities.

Lack of mature and deployable low-carbon alternatives (technological and physical bottlenecks).

Companies predominantly belonging to brown sectors either need:

To transform

To shrink

To shut down

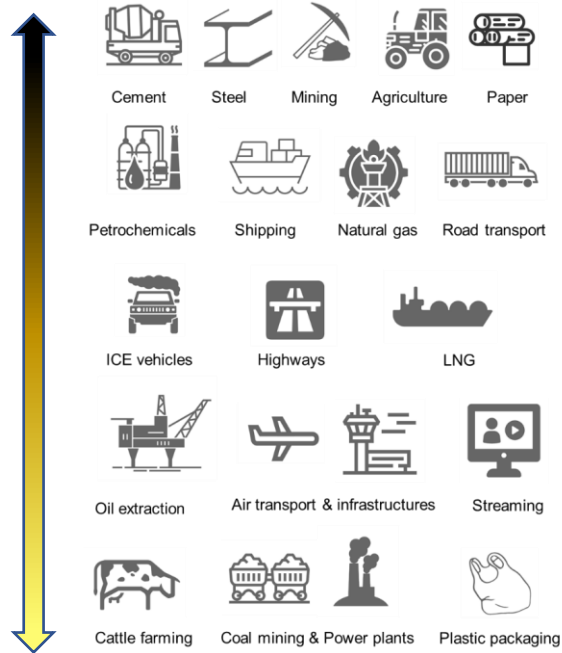
Replaceable industries must rather shrink or even shut down. Nonetheless, some brown industries for which green alternatives exist cannot transition at scale and at an affordable cost without impairing inclusive transition.

- Brown industries display various features, be it in terms of **feedstock, technology & operational processes as well as final output**, serving different purposes or needs.
- These all add up to determining their carbon footprints and **the burden of responsibility** they must bear in the search for appropriate and fair transition solutions.
- Policy makers have classified industries only according to their carbon footprint, but **social considerations are essential**, especially when considering the repartition of carbon cuts and their acceptability.
- **Geographic context** is of the utmost importance and influenced by the level of economic development in a given location.

What industries are urged to transition?

An in-depth look into life-cycles...

More irreplaceable industries (at least on the short-term)



More replaceable industries, or with available substitutes

Two categories of brown activities

Technical Criteria

- **Substitutability:** alternative technology or service exists.
- **Reusability or recyclability:** the activity or product could be recycled or reused with some changes and adaptation.
- **Risks of carbon lock-in:** revolves around the lifespan of the assets/activities and reversibility of the infrastructure. It occurs when a market is stuck with a standard even though participants would be better off with an alternative.

Social Criteria

- **End-use:** the activity or product helps to meet basic services such as heating, lighting, clean water, by contrast with leisure purpose such as international tourism.
- **Marginal abatement cost:** whether it can be socially managed.
- **Access fairness & affordability:** the activity or product is not only accessible to a minority of the population.
- **Demand trends:** The activity or product takes into account the consumption dynamics intertwined with other socio-economic aspects (lifestyles, cultural identity, symbolic, and social preferences).
- **Ubiquity & pervasiveness:** The product or activity surrounds daily life.

What industries are urged to transition?

...to identify burning priorities and emission abatements

Hard-to-abate emissions in the industry

1. In the IEA's Sustainable Development Scenario, direct emissions from industry must decline by 50% until 2050.
2. Overall, most emissions savings are expected from production of cement, iron & steel and petrochemicals (2/3 of total industry sector CO₂).
3. Electrification is decisive to decarbonize the industry sector because heat pumps can account for sizeable extra electricity demand.
4. Cement, and iron & steel, which require higher-temperature heat, are particularly hard to electrify.
5. Efforts must be focused on developing alternative materials and improving recycling rates.

Interview insights



Ladislav Smia

Co-head of RI Research
Mirova

- “It is true that cement and steel are more technically difficult to replace, but we don’t necessarily agree that cement and steel are “irreplaceable”. Wood can often substitute cement, for instance, even when building high towers. The Mjōsa Tower in Norway is 18 stories (or 85.4 meters) tall; the skeleton and the facade of the building are made of wood.
- Some products from “high-emitting industries” have beneficial end-uses and serve as enablers of the transition. It is what the EU taxonomy calls “greening by” activities. A life-cycle analysis is necessary while assessing brown activities.

The example of plastic

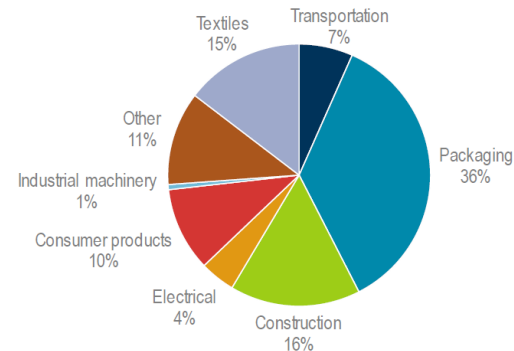
Packaging is the leading end-use of plastic consumption globally.

Ironically, plastic is a material that lasts for hundreds of years, yet it is often used once for a short period of time to maintain the condition of the packaged product.

Packaging can also be frivolous and used as a marketing tool. As such, it is replaceable or with huge room for reduction. In construction or transportation use cases, substitutability is less obvious.

Packaging, similar to bottled water, is highly sensitive to regulation (see recent bans on single use) and customers’ practices and behaviors .

FIGURE | Plastic estimated consumption of plastic by end-use sector



Source: R.Geyer, J.R Jambeck and K.Law, 2017

Case study: meat, an example of (partially) replaceable industry identified

A strategic sector
✓

Technological criteria
✓

Economical & Social criteria
✓

Hurdles or Risks
X

Cattle farming alone accounts for instance for:

- 15% of the global GHG emissions (source: FAO)
- 80% of deforestation in Amazon countries*

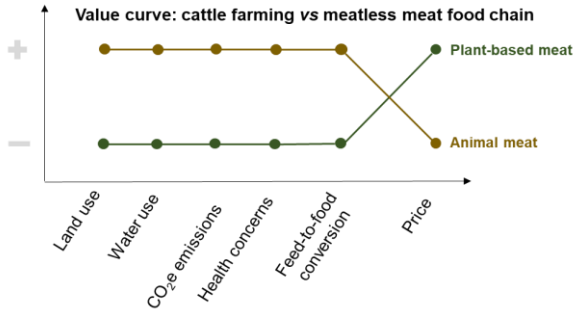
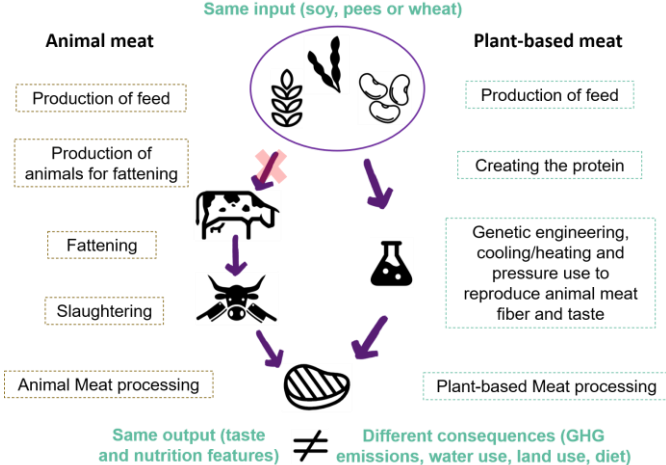
* Source: Nepstad et al. 2008

- Emergence of alternatives:** insect-based protein or plant-based meat (or simply reduced consumption)

- New market players:** “Impossible food” and “Beyond Meat”
- Growing Market:** ~\$3bn in 2019 > \$140bn in 10 years according to a report from [Barclays](#)
- Minor changes in consumption habits required,** but cultural barriers
- More competition, prices are steering down**
- Radical innovation in the protein industry could mean being able both to decently feed 10bn people on earth while alleviating pressure on land use, deforestation and greenhouse gas emissions

- Challengers:** traditional meat companies' lobby
- Market risk:** In a contested market, some players are poised to disappear. Animal producers as well as fattening and slaughtering activities are at risk. Indeed, plant-based meat value chain is simpler, shorter and more efficient: involvement of fewer stakeholders and resources

Two food chains: same output, different consequences



Case study: meat, an example of (partially) replaceable industry identified

Unexpected “technological risk”

The notion of technological risk is often applied to tangible & equipment related industries (e.g., power or car-making industries).

However, the protein industry is also challenged due to “technological innovation”. Rather than incrementally reducing the negative impacts of animal meat industry, **its final use & features for the end-customer are mimicking thanks to a technological leapfrog** (the “animal step” is bypassed).

Nutrition, environmental & pricing features

	Conventional burger (animal meat)	Impossible burger	Beyond burger	The vegetarian Butcher (mc ² NoBeef)
Nutritional facts	Calories: 295 Total Fat: 14g Cholesterol: 47mg Sodium: 414mg Protein: 17g Sugar: 4.2g Calcium: 102mg Iron: 2.9mg	Calories: 240 Total Fat: 14g Cholesterol: 0mg Sodium: 370mg Protein: 19g Sugar: <1g Calcium: 170mg Iron: 4.2mg	Calories: 270 Total Fat: 20g Cholesterol: 380mg Sodium: 380mg Protein: 20g Sugar: 0g Calcium: 20mg Iron: 5.04mg	Calories: 186 Total Fat: 8.1g Cholesterol: 1.9g Protein: 18.6g Sugar: 2.8g Calcium: -- Iron: --
Environmental facts	Kg of CO ₂ e/kg: 99.5 Freshwater withdrawals l/kg: 1,451 Land use m ² /kg: 326	Kg of CO ₂ e /kg: 3.5 Freshwater withdrawals l/kg: 107 Land use m ² /kg: 2.5	Kg of CO ₂ e /kg: 3.5 Freshwater withdrawals l/kg: 9.7 Land use m ² /kg: 2.7	
Retail price	Price/kg: \$15 - \$20	Price/kg: \$26.5	Price/kg: \$25	

Sources: [Conventional burgers nutrition facts](#); [Beyond burger nutrition facts](#); [Impossible burger nutrition facts](#); [The vegetarian butcher: Burgers environmental impact](#); [The economist: Plant-based meat could create a radically different food chain](#)
Who: [Cancer: Carcinogenicity of the consumption of red meat and processed meat](#)

Benchmark

Health considerations:

- A conventional burger contains almost twice as much total fat as a vegetarian butcher burger (14g vs. 8,1g).
- Processed meat has been classified as a carcinogen by the World Health Organization.

Environmental considerations:

- A plant-based burger is 28 times less polluting than the conventional burger (3.5 CO₂e/kg vs. 99.5 CO₂e/kg).
- It takes 145 times more liters of fresh water to produce 1kg of conventional burger than a Beyond burger.
- It takes 130 times more square meters to produce a conventional burger than an Impossible burger or a Beyond burger.

2.3 | THE TRANSITION PANDORA'S BOX

Carbon lock-in & rebound effect

Carbon lock-in risks are inherent to assets with long lives

Definition

Carbon-intensive facilities or assets persisting over time and “locking out” low-carbon alternatives

- Restrict future flexibility and constrain future paths.
- Lead to higher stranded assets risks.

What are the assets prone to lock-in? Technologies with long life-time, high upfront costs and low operating costs



Four criteria to assess carbon lock-in

1

Asset average lifetime

Carbon lock-in risk increases with equipment lifetime: opportunities to invest in lower-carbon technologies arise less often for long-lived technologies and/or with limited turnover

Example of sensitive assets:
Coal power plants (45 years),
Internal Combustion Engine (ICE) vehicles (15 years),
Gas power plants (25 years)

2

Committed CO₂ emissions

Cumulative CO₂ committed by the assets under full normal operation (commitment-based CO₂ accounting)

*Lifetime of the assets (years) X
utilization rate and emissions
factor = "committed emissions"*

3

Financial barriers to alternatives & early retirement

Cost of alternative technology, regulation or carbon price needed for early replacement or decommissioning

4

Institutional, political and social factors

Resulting from norms, amount of subsidies towards incumbent technologies, local employment preservation concerns from politicians, social / behavioral lock-in (consumers' habits)

Source: [Assessing carbon lock-in](#), Peter Erickson et al 2015 *Environ. Res. Lett.* 10 084023

Carbon lock-in & rebound effect

Rebound effect can wipe out expected energy savings

Energy efficiency is not a panacea to curb absolute emissions and can lead to unintended consequences

What?

- **Rebound effects:** when an improvement in energy efficiency triggers an increase in demand for energy. Energy efficiency does not reduce energy demand in a linear, direct, one-to-one manner.
- **Backfire effect:** a rebound exceeding initial gains and increases overall demand.

Consequences?

Making energy efficiency ineffective at reducing energy consumption and GHG.

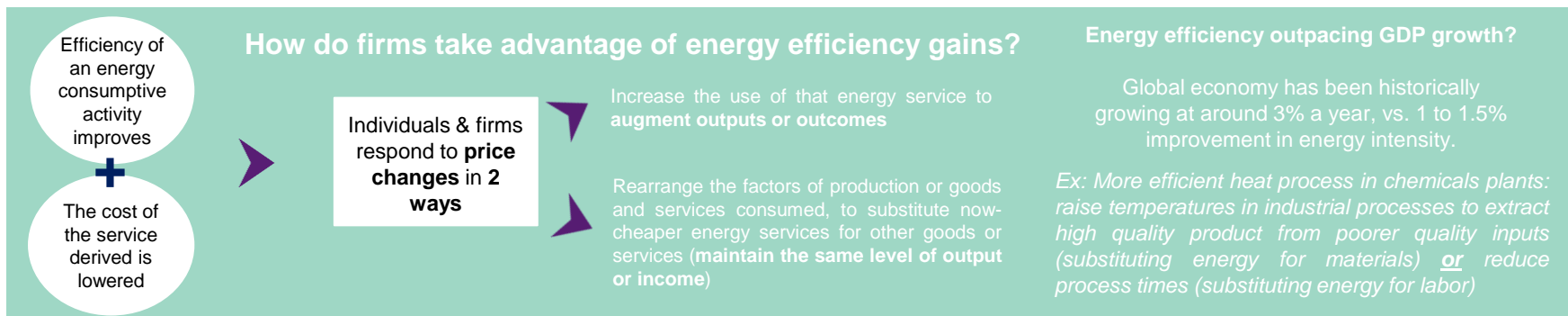
Under what conditions?

Magnitude depends on context:

- **Level of income:** e.g., developing countries where future energy demand growth is expected.
- **Demand saturation/price elasticity** for the products/services in question.
- **Productive activities vs. end-use consumer efficiency.**

How much?

- In rich countries : cars, home heating and cooling, or appliances : **10 to 30%** of the initial energy savings.
- Industrial sectors (electric power, steel) in developing countries : **50 to 90%**.
- Economy wide : **40% to 60% rebound** for developed economies, **50% to greater than 100%** for developing economies.



INTERVIEW

TRANSITION REQUIRES TRANSFORMATION, NOT JUST TRIVIAL IMPROVEMENTS



Ladislav Smia
Co-head of RI Research
Mirova



- It is true that cement and steel are more technically difficult to replace, but we don't necessarily agree that cement and steel are "irreplaceable". Wood can often substitute cement, for instance, even when building high towers. The Mjøsa Tower in Norway is 18 stories (or 85.4 meters) tall; the skeleton and the facade of the building are made out of wood.
- As long as brown activities remain cheaper and more convenient than green activities, it'll be hard to get rid of them. But efforts to put a higher price on fossil fuels have led to major social consequences in several countries. **Focusing innovation on green technologies to make them more competitive and attractive could be a more effective and socially just path to achieving the energy transition.**
- You're right that from a climate standpoint, decommissioning brown assets is obviously preferable over simply selling these assets, but it would involve incurring significant financial losses. **I believe that public authorities have a strong role to play with regard to financing dismantlement.** We cannot require companies to write-off existing brown assets without a regulatory push.
- Most cement and steel companies display only marginal improvements, mainly based on cost optimization with co-benefits. Still, there are few transformative technologies.**
- Green bonds cannot do this alone, though, so it is equally important to review how green bonds fit into the issuers' overall sustainability strategy, how the projects under the green bond would help them transition their business.**

The full interview is available here

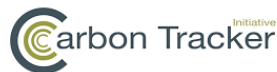


INTERVIEW

CO₂ INTENSITY TARGETS' FLAWS ON A PLANET THAT WORKS ON ABSOLUTES



Andrew Grant
Senior Analyst
Carbon Tracker



Carbon Tracker's view of the transition is framed by the concept of the "carbon budget" – a product of the science which tells us that there is a finite amount of CO₂ that can be released for any given temperature outcome. The planet will therefore need to reach a state of net-zero in order to stabilize warming at any level, because if we are still releasing GHGs on a net-positive basis, the amount of GHGs in the atmosphere is still going up, so the temperature is still going up. [...] **this means that the transition is a matter of "when" rather than "if", and reductions on the use of fossil fuels and indeed other sources of GHGs are inevitable.**

At current rates, the carbon budgets for 1.5°C and 1.75°C would be exhausted respectively in 13 and 24 years. However, proved reserves of coal amount to 130 years, and oil and gas 50 years each at current levels of production

If a company wants to be seen as "Paris-compliant", this means only going ahead with the lowest cost projects in its portfolio that fit within a Paris-aligned level of demand. [...] At the moment, no companies seem to be willing to face the reality of needing to lower overall oil and gas use – they all assume that they will be the last one standing, running the risk of overinvesting in projects that do not work financially in a low carbon world.

The first step towards maximizing returns and minimizing risk in the energy transition, and to be seen as Paris-aligned, is to limit new projects exceeding a Paris-aligned budget and prefer those that fit within the agreement. Once this is done, the company may have excess cash generated from its existing assets, which would not be reinvested into higher cost growth assets.

What the company chooses to do with this cash is a matter for discussion between management and shareholders – if they think that they have the skills to make a success of moving into another industry, that is up to them. If not, they can always take the harvest approach and return capital to shareholders via dividends and buybacks so that investors can redeploy capital as preferred. So, while diversification is an option, it won't be suitable for all, and should be considered on a case by case basis.

[The full interview is available here](#)



“Fair transition”

Sharing efforts and easing some burdens

Definition

"FAIR TRANSITION"

A fair/just transition seeks to ensure that the substantial benefits of a green economy transition are shared widely while also supporting those who stand to lose economically – be they countries, regions, industries, communities, workers or consumers*

FOR BUSINESSES

The governance and efforts made by a company to avoid, minimize, or compensate the social negative impacts arising from its transition, especially on employment.

*Source: European Bank for Reconstruction and Development (June 2020), "The EBRD Just transition Initiative", available [here](#).





KEY TAKEAWAYS

Although action to limit global warming to 2°C will undoubtedly create jobs, in the meantime, **some segments of the economy will be shattered. Cohorts of workers are at risk of becoming redundant.**

To overcome vested interests and obstruction from incumbent actors/stakeholders, **the concept of a “fair transition” is garnering attention from investors & policy-makers** notably in the aftermath of coal phase-out announcements (in France by 2021, Germany by 2038, Italy by 2025, the Netherlands by 2030, Spain by 2030).

According to the International Labor Organization (ILO), the low-carbon transition could create **18 million additional jobs** by 2030. Four types of job evolutions are identified: creation, substitution, destruction and transformation. Around **6.5 million jobs could be created thanks to the circular economy and 1.6 million jobs in the oil sector are in jeopardy by 2030.**

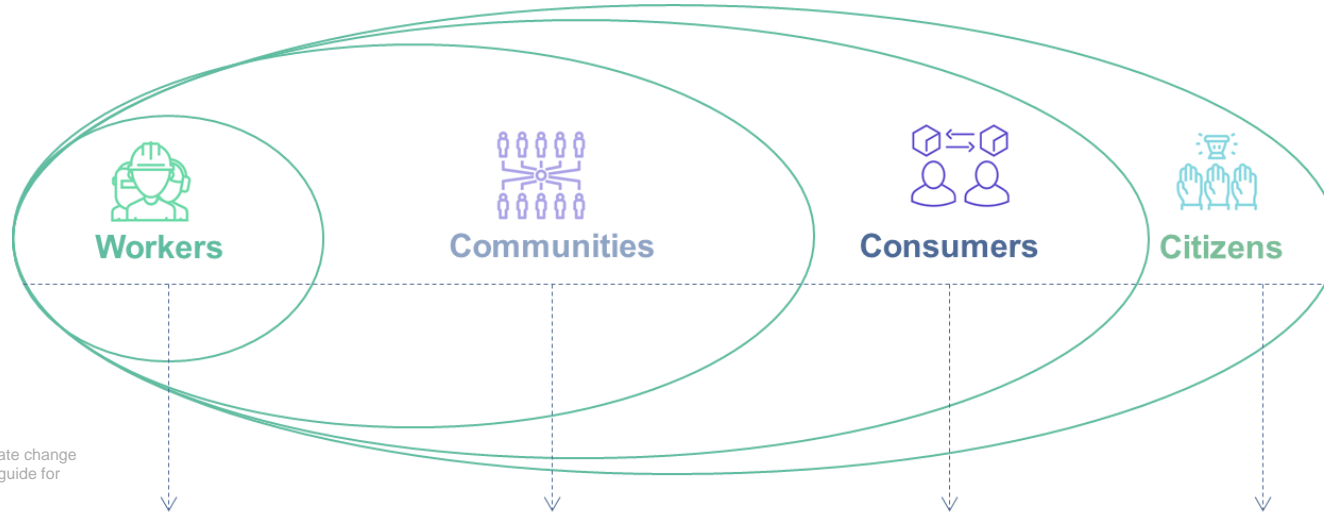
Geographically, Asia & Pacific will see an increase of 14 million jobs, compared to 3 million and 2 million respectively in Americas and Europe. **In the Middle East and Africa employment will fall by 300,000 to 350,000 jobs.**

Low-skilled jobs will be the most affected by the transition, as green sectors require higher skills according to the European Commission (2020) - A Just Transition Fund report.

There is therefore a need to support workers in the most carbon-intensive sectors, particularly with training programs and social protection schemes.



The human dimension of a Just Transition



Source: LSE (2018), Climate change and the just transition - A guide for investor action & Authors

- Involving workers by anticipating employment shifts
- Ensuring dialogue and retraining programs
- Protecting health and safety programs including pensions and benefits

- Understanding negative or positive effects possible from the transition for communities
- Redistributing economic gain from the transition to most vulnerable communities
- Including communities into the process of transition

- Allowing access to basic good and services during and after the transition, including energy, foods and water
- Removing barriers to consumers to support the transition
- Developing transparency on the environmental transition strategy

- Creating the dialogue framework with citizen and designing local and national policy according to them
- Understanding the implications of climate policy for all citizens such as carbon taxes and low carbon incentives

The role of public authorities in steering fair transition to a low-carbon economy

Social Support

Ensure adequate support for workers made redundant by the low-carbon transition, so that they and their communities are not left behind

- Job-search assistance
 - Income support
- Pension bridging programs
- Mobility Packages
- Training and educational programs

Economic revitalization

Help territories transition away from their reliance on fossil-fuel industries

- Innovation strategy
- Public investment strategy
- Industrial strategy

Land restoration

Provide assistance for the decontamination, regeneration and repurposing of sites.

- Decontamination and regeneration of sites
- Consistency with "polluter-pays principle"

Locally Driven

Strong monitoring, review and governance mechanisms

Source: European Commission (2020), [A Just Transition Fund](#)

Public authorities: where the rubber meets the road

How should a fair transition initiative be governed?

- **Engage with local stakeholders** before and all throughout the transition process
- **Understand local conditions:** a just transition is related to local issues and *in situ* situations

Examples of actions:

- **Create forums whose mandate is to meet with affected communities** to hear their concerns, better understand the local situation and establish a relationship between them and the public agency in charge of the transition
- **Create a “local transition center”** to answer questions from workers affected by the transition

What should a just transition initiative provide for workers and communities in transition?

- **Active labour market** to “help enterprises and workers in the anticipation of changing labour market demands in the context of the transition”
- **Social protection policies** to increase “resilience and [safeguard] populations against the impacts of economic and environmental vulnerabilities and shocks”
- Strong labour and welfare policies should go hand in hand with publicly available and up-to-date labour data in all transitioning areas and their neighbouring regions

How should a just transition initiative be planned, monitored and reviewed?

Public authorities should

- Give a clear, long-term and binding timeline for the phasing out of their country or region’s carbon-intensive sectors
- Adequately monitor and evaluate their just transition policies as they are implemented
- Publicly report on them
- Allow for some mid-course adjustments, based on factual, scientific assessments of clearly-defined success indicators

Source: European Commission (2020), [A Just Transition Fund](#)

Stakeholders & commitments: the different dimensions of a “Just Transition”

Challenges	Businesses		Public Authorities
	Workforce involvement	Social protection policies	Economic redistribution
	Workers		Consumers & communities
<p>Highly-exposed sectors (high emitting industries)</p> <p>Engaging workers and unions in the strategic planning of the transition, ahead of social turmoil</p> <ul style="list-style-type: none"> ➢ Defining some activities or product phasing-out timelines, business mix diversification, active human resources policies. <hr/> <p>If assets and production capacities repurposing is impossible:</p> <ul style="list-style-type: none"> ➢ favoring existing employees to work on the decommissioning of doomed plants or facilities. 	<ul style="list-style-type: none"> • Identifying among employees the jobs and workers’ cohorts at risk of becoming redundant. • Prioritizing the most vulnerable employees with low employability (e.g., elderly or non-graduate workers). • Exploring first the repurposing of fossil fuel facilities (e.g., conversion of coal power plants to biomass plants or other activities), before considering decommissioning or assets disposals. • Making efforts to go beyond legal requirements in terms of employee’s support (training, career advice & redeployment). 	<ul style="list-style-type: none"> • Redistributing the wealth created by the ecological transition in particular for those populations most affected by climate change: <ul style="list-style-type: none"> ➢ Workers from severely hit sectors ➢ Emerging countries and coastal populations ➢ Farmers facing climate-change related weather events, etc.) • Tackling energy poverty in industrialized countries. • Ensuring fairness in carbon pricing. 	
<p>Resilience to climate change consequences</p> <p>Involving local workers in the governance of future environmental challenges.</p>	<p>Ensuring workers are resilient to heat stress and other physical impacts of climate change to protect wellbeing, incomes, and productivity.</p>	<p>Anticipating the consequences in terms of affordability of some basic services and existence of substitutes.</p>	

Source: Green & Sustainable Hub , Natixis (2020) & UNPRI (2019), [Why a just transition is crucial for effective climate action](#)

The need for mobility packages

- Employment consequences of the low-carbon transition **are geographically concentrated**
- **Carbon-intensive sectors such as coal mining are centralized and clustered**
- However, for operation and maintenance of green activities that tend to be disseminated, jobs created are therefore geographically widespread

Reskilling policies

A review of retraining programs by Kluge et al. (2016) estimates that only one third of reskilling programs have a positive impact on labour market outcome.

In order to be effective, reskilling policies must:

- 1 Be periodically reviewed and revised
- 2 Target specific workers considered most likely to succeed
- 3 Respond to specific job offers and skill mismatches in the local labour market

Source: European Commission (2020), A Just Transition Fund & OECD (2018), A review of "Transition Management" strategies



Employment challenges in the context of decarbonization strategies

Quantitative impacts of climate policies on employment: 18 million additional net jobs¹

Jobs are affected in four ways (see below)

Job creation	Job destruction	Job transformation	Job substitution
<p>The expansion of a low carbon economy will translate into higher labour demand across many sectors.</p> <p>Examples:</p> <ul style="list-style-type: none">• Energy efficiency• Renewable energy• Organic agriculture• Adaptation projects• Infrastructure projects	<p>Certain jobs may be eliminated – either phased out or massively reduced in numbers – without direct replacement.</p> <p>This may happen where polluting and energy-and-materials intensive economic activities are reduced or phased out entirely.</p> <p>Example:</p> <ul style="list-style-type: none">• Coal industry at large (from mining to power generation)	<p>Many, and perhaps most existing workers (metal and construction workers) will simply have their jobs transformed and redefined as day-to-day workplace practices, skill sets, work methods and job profiles are “greened”.</p> <p>Examples :</p> <ul style="list-style-type: none">• Plumbers and electricians working in the brown economy can, in principle, be reoriented to carry out similar work in the green economy	<p>Some jobs will be substituted as a result of shifts in the economy to more efficiency, to lower carbon, and to less polluting technologies, processes and products.</p> <p>Examples:</p> <ul style="list-style-type: none">• Shifts from fossil fuels to renewables• From road transportation to rail• From internal combustion engines (ICE) to electric vehicle powertrains• From landfilling to recycling and refurbishing

¹ International Labor Organization (2018) [Greening with Jobs](#) report : 24 million jobs created – 6 million jobs eliminated in a just transition 2030 scenario

² United Nations (2020), [Just transition of the workforce, and the creation of decent work and quality jobs](#)

Foreseeable employment evolutions by 2030 arising from decarbonization policies

FIGURE | Employment evolution in the energy sector by 2030 (worldwide)¹

Job evolution	Industries with highest job demand growth	Job evolution	Industries with strongest job demand decline
6.5 million	Construction	-1.6 million	Petroleum refinery
2.5 million	Manufacture of electrical machinery	-1.4 million	Extraction of crude petroleum and services related to crude oil extraction, excluding surveying
1.2 million	Mining of copper ores and concentrates	-0.8 million	Production of electricity by coal
0.8 million	Production of electricity by hydropower	-0.7 million	Mining of coal and lignite, peat extraction
0.8 million	Cultivation of vegetables, fruits, nuts	-0.5 million	Private households with employed persons
0.8 million	Production of electricity by solar photovoltaics	-0.3 million	Manufacture of gas, distribution of gaseous fuels through mains
0.7 million	Retail trade, except of motor vehicles and motorcycles; repair of personal and household goods	-0.2 million	Extraction of natural gas and services related to natural gas extraction, excluding surveying

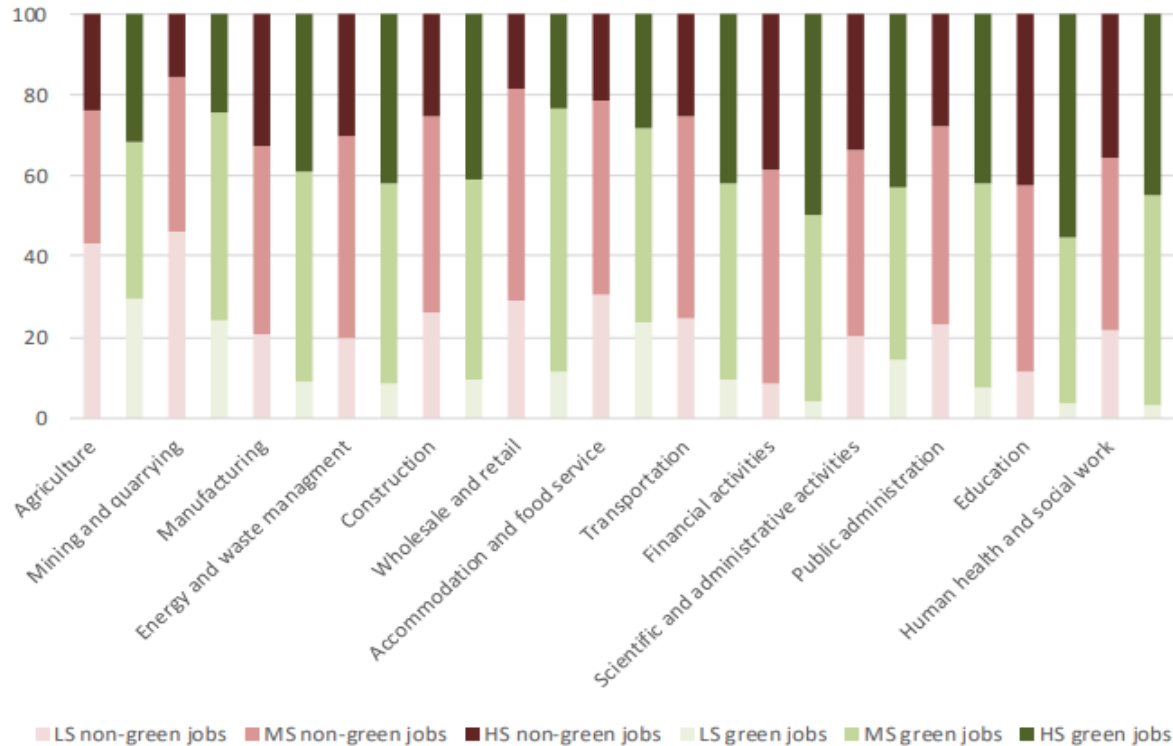
¹ International Labour Organization (ILO) (2018) [Greening with Jobs](#) report : 24 million jobs created – 6 million jobs eliminated

Focus on the coal sector in the EU in 2018²

- **207 coal-fired power plants still operating** across 21 Member States.
- **128 coal mines** still being exploited in 12 Member States.
- **A total of 237,000 jobs**, of which 185 000 are in coal mining.
- **215,000 jobs** indirectly dependent on coal activities.
- **Poland** faces the greatest risk for job losses, followed by **Germany, Romania, Bulgaria and Spain**.
- At a regional level, massive jobs in these sectors are to be found in **Silesia (Poland)** and in **Sud Vest Oltenia (Romania)**.
- **Silesia could lose up to 40,000 jobs**, which is about half of total employment in the region. Three other regions located in the Czech.
- Romania and Bulgaria could each lose more than 10 000 jobs in the transition.

Employment transformation in the context of decarbonization strategies

FIGURE | Employment evolution by skill level by 2030 (%)



- In terms of political solution, this means that reskilling and employment policies will be particularly needed in the sectors where mismatches are greatest.
- In non-green sectors where low-skill (LS) jobs are being replaced mostly by medium-skill (MS) jobs in green sectors, upskilling/reskilling might be effective.
- By contrast, in brown sectors where low-skill jobs are being replaced by high-skill (HS) jobs in more sustainable activities, early retirement policies, combined with training measures for young workers, might be more effective according to the European Commission.

Source: European Commission (2020), [A Just Transition Fund](#)

Fair Transition initiatives around the world



The “Solidarity and Just Transition Silesia Declaration”

The “Solidarity and Just Transition Silesia Declaration” was signed by **50 countries** at COP24.

The declaration states that *“a just transition of the workforce and the **creation of decent work and quality jobs** are crucial to ensure an effective and **inclusive transition**”.*

It emphasizes that *“development measures to make **infrastructure climate-resilient** and enhance **institutional capacity** in this respect have the potential to be a **source of decent jobs creation for both women and men** while improving **resilience in vulnerable countries**”.*

“Climate Action for Jobs Initiative”

“Climate Action for Jobs Initiative”, co-led by the **International Labour Organisation**, Spain and Peru, with **46 countries** committing to develop “national plans for a just transition and create decent green jobs”.

It is based on three inter-related complementary areas; advocacy and outreach; a policy innovation hub that will gather knowledge and generate innovative solutions; and **capacity building and support** for governments, workers’ and employers’ organizations.

The Initiative brings together **governments, trade unions, employers’ organizations and international agencies**.

The European Union Just Transition mechanism

The European Commission recently disclosed **“The Just Transition Mechanism”** (see [Green Deal Communication](#), December 2019), which focuses on the regions and sectors that are most affected by the transition **because they depend on fossil fuels or carbon-intensive processes**.

It will draw on sources of funding **from the EU budget** as well as the **European Investment Bank** group to leverage the necessary private and public resources.

The goal is reportedly *“to protect the citizens and workers most vulnerable to the transition, **providing access to re-skilling programs and jobs in new economic sectors, or energy-efficient housing**”.*

The European Commission committed to work with the Member States and regions to help them put in place territorial transition plans.

Joe Biden’s agenda

Increase coal companies’ payments into the **black lung benefits** program

Reform the black lung benefits system so it is **no longer in favor of coal companies**

Pay for pensions and health benefits for coal miners and their families

Create a task force on Coal and Power Plant communities, helping these communities access federal investments

Leverage private sector investments to **help create high-paying union jobs based upon the unique assets of each community**, partner with unions and community colleges to create training opportunities for these new jobs

Repair infrastructure, keep public employees like firefighters and teachers on the payroll, and keep local hospitals open.

Case study: UK utility SSE “Just transition plan”



In November 2020, The UK utility SSE has published a “Just Transition plan”. The firm, which employs 12,000 people around the world, has pledged to adhere to 20 principles to help to protect workers and communities as the UK moves towards net zero. **SSE’s Just Transition plan is classified in two categories :**

Opportunities linked to the transition into a Net Zero world

Principles for green jobs	Principles for consumer fairness	Principles for building and operating new assets
<ul style="list-style-type: none"> Guarantee fair and decent work Attract and grow talent Value employee voice Boost inclusion and diversity 	<ul style="list-style-type: none"> Co-create with stakeholders Factor-in whole system costs and benefits Make transparent, evidence-based decisions Advocate for fairness 	<ul style="list-style-type: none"> Support competitive domestic supply chains Set social safeguards Share value with communities Implement responsible developer standards

Consequences linked to the transition out of High-Carbon world

Principles for people in high carbon jobs	Principles for supporting communities
<ul style="list-style-type: none"> Re-purpose thermal generators for a net-zero world Establish and maintain trust Provide forward notice of change Prioritize retraining and redeployment 	<ul style="list-style-type: none"> Deliver robust stakeholder consultation Form partnerships across sectors Promote further industrial development Respect and record cultural heritage

Examples of principles in practice

- SSE will create over 1,000 new direct, contractor and supply chain jobs linked to the £3bn Seagreen offshore wind farm near Angus, the £580m Viking onshore wind farm on Shetland and the £630m subsea power cable connecting the island to the Scottish mainland.
- It has launched a pilot ‘STEM returners’ Program to recruit people who have taken a break from a STEM career, as well as a new STEM Education Program across Scotland, forming strategic and local partnerships with schools and colleges near its sites.
- It closed its last coal-fired power station, Fiddler’s Ferry, near Warrington, at the end of March 2020. 39 employees transitioned to work on the station’s decommissioning program, five were redeployed to other roles within SSE, one retired and 95 redundancies were completed following collective consultation with employees and unions. Several training courses were delivered ahead of station closure, which included support for redeployment in alternative roles in new sectors.
- The Humber Cluster Plan: working with partners to develop a comprehensive plan that will illustrate how the Humber region can achieve net-zero carbon emissions by 2040, potentially making it the first industrial cluster in the world to do so.

Source: SSE (November 2020), Supporting a just transition

INTERVIEW

FAIR TRANSITION DEFINITION FROM UNIONS



Samantha Mason

Policy Officer
PCS Trade

Workers and communities should not pay the price of transition and ensure that they are protected in terms of their livelihoods and future job prospects.

The global trade union movement have long argued for the concept of a Just Transition to be included in national economic plans. This was incorporated into the preamble of the Paris Climate agreement in 2015, and backed up by the Silesia declaration at the last COP.

The necessity of retraining programs

There have been many studies detailing the transition from fossil fuel energy jobs to renewables. Many of these skills are comparable but would require retraining/reskilling programs. What we may call jobs that need repurposing for a different energy technology. For example, a report for the Scottish Green Party in 2015 – “Jobs in Scotland’s New Economy” sets out a clear comparison with jobs and skillsets in offshore oil and gas with offshore wind renewable energy infrastructure. This includes engineers, machine operatives, helicopter pilots, surveyors, welders as well as those with Science, Technology, Engineering and Maths (STEM) skills.

Meeting the imperatives of the science of climate change and the targets of the Paris accords will require national level coordination with proactive employment and economic restructuring policies, which put workers and their communities at the forefront.

The full interview is available here



INTERVIEW

LOW-CARBON TRANSITION AGENDA: AVOIDING SOCIAL QUICKSAND



PATRICK ARTUS
Senior Economic Advisor of Natixis

- ''** *To mitigate the social effects of a CO₂ tax, the most efficient solution is to explicitly redistribute the proceeds of the tax to the population, specially to the low-income people [...] in a way which is completely decorrelated from their energy consumption.*
- ''** *I am worried that the pressure to go too fast would lead to bad decisions: using technologies that would prove afterwards not to be the right ones (for instance lithium-ion batteries vs hydrogen), disrupting a number of industries (car making, airlines, tourism...) before they can adjust their technologies.*
- ''** *The same applies to the capital markets, if the demand for the debt and the equity of the “brown” companies diminishes rapidly, the market value of these companies will collapse, hence a financial crisis and the shrinking of their investments.*
- ''** *The estimated elasticity of fossil energy consumption to its price is very low: -0.09; it means that an 11% increase in the price of fossil energy is required to reduce its consumption by 1%. **Therefore, a price-based mechanism (like a CO₂ tax) would be very inefficient to reduce sufficiently the use of fossil energy** (remember that, to respect the Paris Agreement, a 4% a year reduction in CO₂ emissions is required whereas CO₂ emissions worldwide have increased by 1% in 2019). The consequence is obviously that **regulations will have to be the main instrument to reduce CO₂ emissions.***

The full interview is available here





03.

TRANSITION LEVERS & CASE STUDIES



KEY TAKEAWAYS Chapter 3

To assess the different transition profiles of companies, we designed a **methodology encompassing five levers** a firm can activate to reduce its emissions and align with a below 2°C global temperature increase scenario.

At corporate level, transitioning is multi-faceted involving these different but complementary levers...

Quit/Exit

Exiting an activity because of its highly emissive feature (coal, tar sands) and/or because there are competitive substitutes. Firms can either convert, divest or decommission brown assets.

Diversify

Growing organically, acquiring or merging with less emitting actors to change their business mix (e.g., foray in renewable energy for an Oil & Gas company).

Decarbonize core activities

Investing and implementing new processes, feedstock/fuel changes, R&D expenses in less carbon-intensive processes (incremental or radical innovations).

Offset

Compensating for emissions by buying or developing offsetting projects (VCS, Gold Standard), including natural capital solutions, or by investing in/and developing CCUS projects.

Provide decarbonization solutions

Helping other companies to decarbonize; low-carbon electricity or biofuels providers, an aluminum producer helping with mobility's electrification (lighter cars)

- Our methodology frames a **change management model** that differentiates brown companies into groups depending on whether they need to **transform, shrink or shut down**.
- In the case studies proposed, we paid heed to **levers mobilization, the governance associated, investments and timeline involved in the transition pathway**. Trade-offs, obstacles, unintended consequences and the impact of the chosen levers on the overall transition of the company are analyzed (results achieved, impact on carbon intensity, foray in new market).

3.1 | OUR FIVE TRANSITION LEVERS

Mapping of the different levers actioned by a sample of companies

	Self-decarbonization ("greening of")				Outbound decarbonization ("greening by")
	Quit/exit some activities	Diversify activities	Decarbonize core activities	Offset your emissions	Greening of (solutions provider)
	✓	✓			
	✓	✓			
	✓	✓			✓
	✓	✓	✓		✓
	✓	✓	✓	✓	✓
					✓
		✓	✓	✓	✓
		✓			✓
					✓
			✓		✓
					✓

Source: companies' websites and authors

- Mobilizing *to some extent* different levers does not answer the question of **whether it is done sufficiently**, nor if it reflects the overall strategy of the company.
- In the case of the most irreplaceable industries, one expects less activities diversification (e.g., cement producers will not become mobility providers).
- **“Exiting” could be from a source of power supply or a feedstock** (e.g., coal, or palm oil for biomass), **or from a segment of activity or product** (e.g., coal mining for a mining company). Quitting requires to diversify if the company is to survive.
- **Levers are often intertwined.** Decarbonizing core activities has benefits in terms of outbound decarbonization. If a company offers lower carbon basic materials, it lowers the upstream emissions of its customers (a lower emission cement ticks the box “decarbonize core activities” but also “outbound decarbonization” (solutions providers) to real estate companies).

3.2 | OVERVIEW OF CASE STUDIES

- ✓ LEVER #1 | Quit/Exit most climate harmful activities
- ✓ LEVER #2 | Diversify activities & products
- ✓ LEVER #3 | Decarbonize core & hard-to-abate activities
- ✓ LEVER #4 | Offset emissions
- ✓ LEVER #5 | Provide decarbonization solutions



Lever #1 | Quit/Exit most climate harmful activities

What does an “exit” strategy mean ?

Change activity and/or business model by divesting or disengaging from some activities (coal), with two alternatives unequally beneficial for climate change: asset disposal/sale vs. decommissioning

What are the activities concerned ?

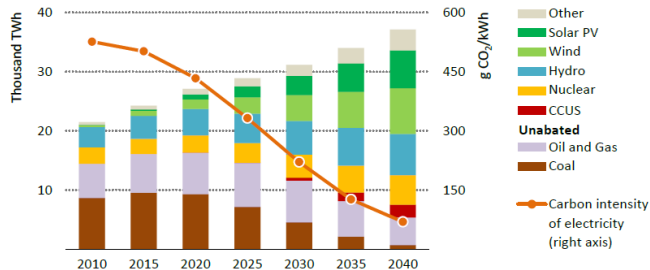
There is no real consensus to define a list of such activities:

- A taxonomy of brown activities could be developed within the EU Taxonomy Framework (it is part of the review clause of the Taxonomy Regulation)
- One bears in mind that **nuances for the same source of energy are necessary**. As an illustration, emissions (scope 1 and scope 2) from oil production can vary significantly, from 20g CO₂ equivalent/per megajoule for Venezuela’s production to less than 5g for Saudi Arabia*.

Example of activity: coal power generation

The figure below shows that **unabated coal must be reduced to almost zero in power generation by 2040** according to the IEA’s Sustainable Development Scenario (SDS), which is its most ambitious and Paris Agreement aligned scenario. There may be **divergences in terms of the timing and extent of such phase-out ambitions**.

FIGURE | Projected Electricity generation & carbon intensity by source in the Sustainable Development Scenario

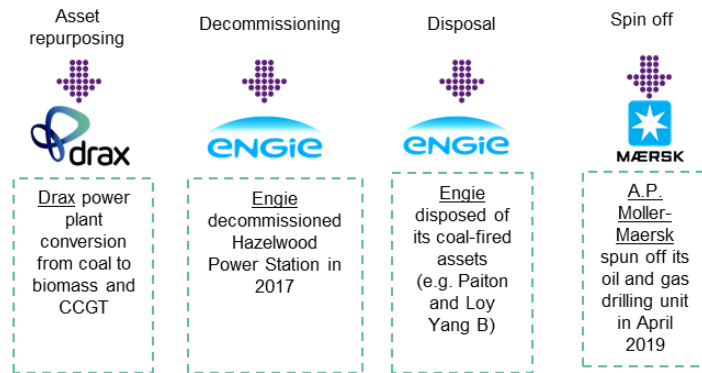


* Source: IEA (2018), World Energy Outlook; The Economist (November 2nd 2019), Briefing Saudi Aramco, Stanford University; Rystad

Strategies to exit

- 1 Asset repurposing: the polluting assets are reused in less carbon-intensive activities
- 2 Asset decommissioning: the polluting asset is gradually closed
- 3 Asset disposal: the polluting asset is sold to a third party
- 4 Asset divestment and spin-offs

Divestment and spin-offs are the fastest way for individual companies to achieve carbon reductions (both in relative and absolute), but they are by definition one-off events and do not reduce overall GHG emissions .



Focus on the components of “exit lever”

Selling off coal-fired power plants to third parties does not reduce overall emissions: upon the closing of such transactions, assets usually remain in operation and continue to generate emissions under a different owner.

Note that the [GHG Protocol](#) requires base year emissions recalculation in case of structural changes. Recalculation of baselines is necessary because such structural changes merely transfer emissions from one company to another without any change of emissions released to the atmosphere. Whether base year emissions are recalculated (excluding the sold assets) depends on the significance of the changes.

As such, a complete decommissioning of the most highly emissive assets is more impactful than a mere change in ownership.

However, we should not judge companies that choose to sell certain assets, as we understand the financial implications of such decisions.

Public authorities should, under specific circumstances, subsidize decommissioning. In any case, disposal has to be reviewed holistically with other steps that a company takes to transition, to determine if it is a one-off event or part of a strategy that is comprehensive and include internal core decarbonization.

Among the Exit/Quit options, the “repurposing” or “redevelopment” of the facilities is probably the most beneficial as it allows to maintain economic activity in the areas, especially to preserve jobs.



As an illustration of “repurposing”, Siemens Gamesa has experimented with a new storage solution based on volcanic stones that capture and store heat produced from renewable energy sources. Former coal power plants are reportedly converted for such large-scale and inter-seasonal storage (stones can stay hot for weeks). Thermal fossil fuel power stations can thereby become CO₂ free energy storage plants, combining existing equipment with new technology. This transformation minimizes the negative effects of plant closure with the furnace being replaced by electric thermal energy storage (ETES), while steam cycle and operation processes remain in place.

The Danish oil & natural gas company (formerly Dong Energy AS) became Ørsted in 2017 following its divestment from upstream oil & gas. Ørsted's operations include electricity generation from offshore wind & bioenergy, energy storage, renewable hydrogen & technological innovation for decarbonization. It is a market leader in offshore wind (25% of global market share), intends to triple the number of persons it powers from 9.5 million in 2019 to 30 million by 2025.

Power sector's transition opportunities

This case study focuses on the **offshore wind market** (Ørsted's biggest green footprint so far).

- **Offshore wind market** has had an annual growth of 30% since 2010. The volume of potential power generation is estimated at 420,000 TWh per year worldwide (IEA, Offshore Wind Outlook 2019), which is 18 times more than global electricity demand in 2018 (23,300 TWh).
- Prediction of a market growth of 13% per year over the next two decades in IEA's Stated Policies Scenarios.

Ørsted is an **unrivaled leader**: it developed the world's first offshore wind farm in 1991, built the largest wind turbine in 2017 and the world's largest wind farm that came online in 2020.

Governance, timeline & shareholding

- **Planning to exit coal entirely by 2023.** This would see its emissions plunge by 96% (an 83% decrease as of mid-2019) against a 2006 baseline when it used up more than 6.2 million tons of coal.
- **Adopting a science-based target for emission reduction in heat and electricity generation** by cutting back Scope 1 & 2 GHG emissions to 98kWh by 2025 from a 2006 base year, and reducing absolute Scope 3 GHG emissions to 50% by 2032 against a 2018 base line.
- **Embarking on a conversion of its coal-fired plants to sustainable biomass.** In 2018, offshore wind and bioenergy accounted for 81% Ørsted's capital employed.
- **Selling its O&G assets rather than decommissioning it,** meaning that the facilities would keep on generating emissions during their operating life but Ørsted would no longer be liable for those emissions.

How the company opted for the "exit" lever

In 2017, Ørsted decided to **sell its upstream oil and gas business** to Ineos for \$1.3 billion.

- Transition process included a **deep rebranding process & change of the business model** from an upstream O&G producer, coal-based electricity & heat generator, to an entirely green electricity & heat generator.
- Ørsted is a **partially State-owned company** and the government has been vocal in terms of the energy transition (public shareholding can be a determinant criteria, *idem* with Engie). As of September 2019, the Danish government owns 50.1% of the company.
- The Danish government must keep a majority share until 2025. Decreasing its participation from the 50% is subject to a new political agreement.

Source: Ørsted's company report

The effectiveness of its transition is reflected in its numbers: from 462g CO₂e/kWh in 2006 to 131g CO₂e/kWh in 2018 and striving to reach 10 g CO₂e/kWh through a complete phasing out of coal by the beginning of 2023

EXIT

- Divestment from coal
- Phase out from O&G with a major divestment in 2017 (selling the exploration business for US \$1.3bn)

DIVERSIFY

- Develop, build, own, operate & exploit offshore and onshore wind farms and/or turbines.
- Bioenergy (biomass CHP plants and biogas generation)

DECARBONIZE CORE ACTIVITIES

Convert all its coal-fired power plants to biomass-fired power plants (mainly using wood pellets & wood chips) by 2023

OFFSET

Not mentioned by the company

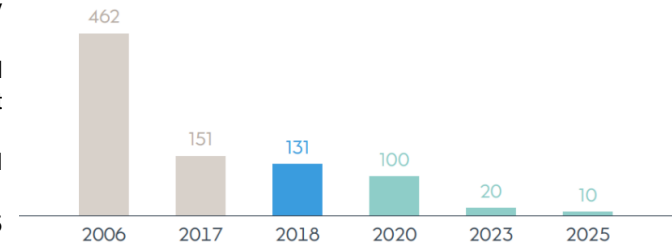
PROVIDE DECARBONIZATION SOLUTIONS

Develop intermittent energies & create scalable Battery Energy Storage System. Create competitive storage systems: Carnegie Road project (Ørsted's first commercial stand-alone BESS)

In a nutshell

- **Is it ambitious?** This strategy matches Paris agreement pledges. The transition has already taken place and the company has almost become a pure green player.
- **Is it consistent?** The pivotal shift occurred in 2017 when the company divested from oil and gas exploration and exploitation, and it has been consistent and progressive over the last five years. It is a good example of consistent, total and radical change in business model.
- **Is it game changing?** Being able to propose scalable and competitive offshore wind facilities and operations makes Ørsted a game changer and contributor to the transition.
- **Is it enough?** Yes it is. A carbon intensity of around 10 gCO₂/kWh is to be reached in 2025 and would make Ørsted an indisputable forerunner.

FIGURE | Ørsted's power carbon intensity (g CO₂e/kWh)



Source: Ørsted's company report

Engie: the impact of exiting coal on the Group's transition

FIGURE | The power sector

Engie is a French multinational energy utility group in the gas and electricity value chain and operates in 70 countries. **Since 2016, with the "Zero-carbon transition" plan, it has recorded a significant decrease in both absolute and relative GHG emissions** coupled with the installation of renewable capacities in both absolute and relative terms. Engie pledged to align with the 2°C target of the Paris Agreement and its decarbonizing targets have been certified 2°C aligned by the SBTi (Science Based Targets Initiative) in 2020.



40%

of global energy-related CO₂ emissions

Influence other sectors' emissions

especially those with significant Scope 2 emissions.

Two main barriers for drastic emission reduction in the power sector

The steady global electricity demand

The dominance of coal in the global electricity mix (38% in 2018 *versus* 35.5% for low-carbon technologies)

How Engie opted for the "Exit" lever?

1

By phasing out coal

In 2019, coal capacity represented 4% of the electricity generation capacity (a 55% reduction in Scope 1 carbon emissions occurred between 2016-2019). Decommissioning and asset-disposal have been deployed to exit from coal (Chile, Australia, UK). The CO₂ emissions related to power generation should reach 43 Mt by 2030 (vs. 149 Mt in 2016).

2

By disposing carbon intensive assets

Between 2016 and 2018, Engie generated €16bn through the disposal of these assets (in the USA, India, Indonesia). In 2019, it disposed of its coal-fired power plants in Thailand, the Netherlands and Germany.

3

By pulling back from projects

In Chile, Engie is for instance replacing 1 GW of coal-fired assets with 1 GW of renewable energy.

TAKEAWAYS

- **Companies should be ready to take bold measures** (backing away from already financed projects with some public support).
- **The exit lever can be part of the strategic orientation.** Between 2015 and 2019, coal decreased from 13% to 4% in Engie's energy mix. It also set the target of 58% of renewable energy in the electricity mix in 2030 (28% in 2019).

Source: Engie, "2020 Integrated Report" (April 2020)

Engie: the impact of exiting coal on the Group's transition



Engie targets an 85% absolute direct (scope 1+2) emission reduction for 2050: from 149Mt in 2012 to <20Mt in 2050. The exit lever has been activated radically (see the figure below, the coal capacity declined from 15.1 in 2015 GW to 7.2GW in 2018). The decommissioning & disposal of assets contribute to a large part of the direct emissions reduction.

EXIT

Between 2015 and 2019, coal decreased from 13% to 4% in Engie's energy mix.

DIVERSIFY

Investing significantly in clean gas (hydrogen, biogas, €800m between 2018-2023 to achieve the targets of 10% of renewable gas by 2025, 30% in 2030, 100% in 2050). Engie sets the target of 58% of renewable energy in the electricity mix in 2030 (28% in 2019).

DECARBONIZE

- An 85% absolute direct (scope 1+2) emission reduction for 2050
- A 52% reduction of emissions per kWh of energy production between 2017 and 2030
- A 34% reduction of the emissions linked to the use of Engie's products sold between 2017 and 2030s

OFFSET

Not mentioned by the company

PROVIDE DECARBONIZATION SOLUTIONS

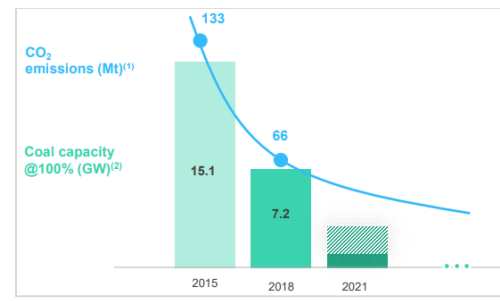
Providing low carbon energy to clients, integrated energy efficiency solutions for buildings and works to offer efficient renewable energy storage systems (power to gas).

In a nutshell

- **Is it ambitious?** According to the Transition Pathway Initiative, its emissions intensity and targets are aligned with the Paris Agreement. The rapid activation of the exit lever was a positive signal (the full assessment is available [here](#)).
- **Is it consistent?** Not completely. Engie is not a pure green player yet, though it sets a clear transition plan and builds its strategy on transition opportunities.
- **Is it game changing?** Yes, to some extent. It disposed some of its carbon intensive assets instead of decommissioning it (equivalent to a complete cease). Nonetheless, by making the carbon-neutral transition at the core of the strategy, acting worldwide, the Group offers a sound transition example. .
- **Is it enough?** So far, yes. The company is on the right track and needs to meet its engagements with the same dedication it exited coal.

Source: Engie's company report

FIGURE | Coal phase out and CO₂ reduction



Lever #2 | Diversify activities & products

What does diversification mean ?

Diversification is a well-known business option employed to expand a company's market position. In the context of brown industries' transition, it has an additional application as it could also allow reducing a company's carbon intensity while expanding its activities and growing its revenues.

Diversification is often the first step of a phase-out process to hedge against transition risks in more carbon intensive sectors. The impact of actioning the diversification lever is magnified at scale when done alongside other levers because external growth by itself would do little but merely reduce the carbon intensity of a company without affecting its absolute emissions.

Input Diversification

Input diversification describes a change in **feedstock, fuels or chemicals**. It reduces carbon intensity for a given end-product.

This would not be considered as diversifying in our analytical framework as we strictly linked "diversification" with the offering of new products. Such input diversification rather falls within our "decarbonize core emissions" lever.

Output Diversification

Output diversification describes **the expansion of a company's range of products and services and the reduction of its overall carbon intensity of products sold**. It is this form of diversification that we refer to in our 5-lever framework.

It can be pursued through external growth (inorganic growth) by acquiring new output production capacity from other companies and/or through internal product development.

What are the activities concerned ?

- **Horizontal diversification** is a must have in some specific sectors **where there are substitutes**, i.e., more replaceable ones (see the section "are brown companies all equal ?").
- It is not considered activating the diversification lever either if the new product has the same characteristics as the existing one except it is less carbon-intensive to produce.
- We can consider the diversification lever to be activated **when the parent company is developing a new business in which it was not previously involved in** as long as it was not its main or predominant business (i.e., it derives the most profit from).

EXAMPLE OF DIVERSIFICATION

In the oil & gas industry for instance, substitutability varies according to end use, from extremely high for power generation, moderate for passengers' cars, to very limited for air transport or trucks or petrochemicals..

NOT A DIVERSIFICATION STRATEGY

Neste's renewable diesel, obtained through animal fat and hydrogenated vegetable oil processing has the same chemical construction as conventional diesel. This new product development is not considered as activities diversification in our sense but would instead fall under the core decarbonization lever

Drax, an example of diversification through input changes

Drax is a British group operating at different stages in the power sector. It historically generated electricity from coal-fired power plants but today provides power from different sources. It is activating the “Exit/quit” lever by phasing out power generation from coal replacing it by biomass and gas in its massive 4,000 MW power plant in Yorkshire (Drax power plant).

It has already **converted 4 out of 6 generating units of its power plant to biomass and will convert the two remaining ones to Combined Cycle Gas Turbines**. Drax Biomass, a subsidiary of Drax group, provides its main power plants with wooden pellets that are manufactured in North America (Louisiana and Mississippi).

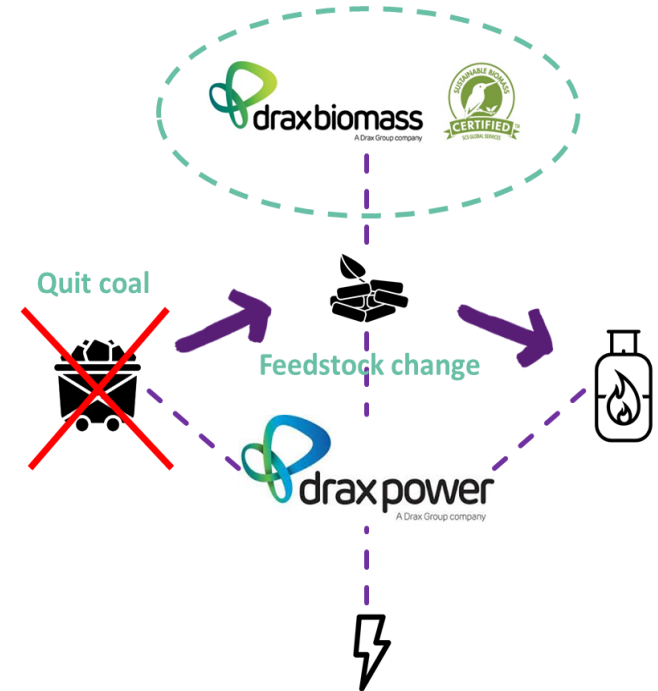
The integration of wooden pellets manufacturing (Drax Biomass) and transportation through a Drax group subsidiary is a way to secure wooden pellets sourcing for one of UK’s strategic power plants (Drax power station in North Yorkshire).

By converting Drax power station to biomass, **the company decarbonizes its core business**. The point of such conversion is **an input diversification** (switch from coal to wood pellets) & organic decarbonization (historical process-related emission reduction). The company is currently one of the biggest generators of renewable power in Great Britain.

It therefore also activates another lever as **a solution provider as it reduces the scope 2 emissions of its clients**.

By converting two coal-fired electricity production units to biomass in 2017, Drax Group’s total Scope 1 carbon emissions decreased by 33.4% between 2017 and 2018 (from 6,296 kt to 4,355 kt of CO₂e) and its intensity by 24% (from 297 t/GWh to 225 t/GWh).

Source: Drax Annual report 2018, Enabling a zero carbon, lower cost energy future.



Oil services companies' opportunistic transition

Although triggered by a slump in oil prices, the **pivotal shift of oil & gas services companies** could have tremendous repercussions on low-carbon technologies developments.

It might also be a significant driver of change in the Oil & Gas industry, as skills needed for the industry to prosper are shifting.

According to Haynes and Boone, a law firm, 190 North American Oil services companies filed for bankruptcy between 2015 and September 2019. The slump in oil prices affected directly oil services companies as the decrease in profitability and blurry perspectives made it hard for majors to invest in new projects.

Examples of oil companies' diversification strategy

Fugro, Aker Solutions, Xodus, Subsea 7, TechnipFMC, Saipem are all oil services companies adapting to unstable oil prices environment by diversifying toward low carbon technology projects engineering:



TechnipFMC decided to spin off a business that focuses on liquefied natural gas and oil alternatives (bio-fuels etc.).



Saipem derives 66% of its revenues from non-oil projects (gas, infrastructure and renewables) in 2019 vs 50% in 2016.



Fugro derives more than half of its revenues from non-oil and gas projects while 5 years ago it was about 22%.

This pivot from oil & gas services companies that are shifting from oil projects towards lower-carbon activities is mainly driven by the oil prices' environment and a growing pool of low-carbon projects. This strategic shift of skills and expertise toward low-carbon technologies could lead to a cost reduction for low-carbon solutions.



Lever #3 | Decarbonize core activities

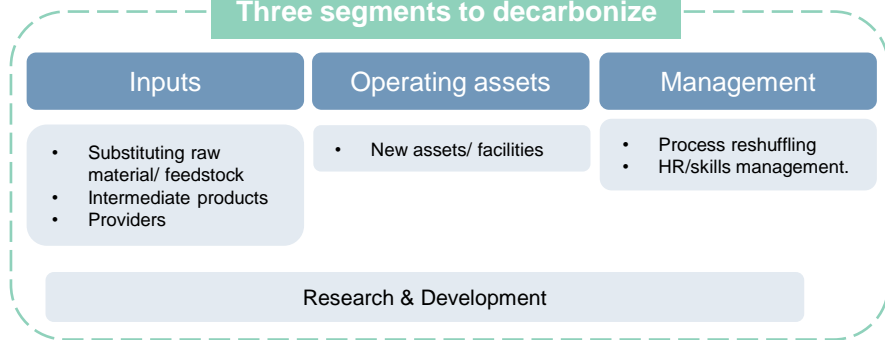
What does a “decarbonize core” strategy means ?

It refers to the efforts and actions undertaken by a company to **keep offering the same products and services** (for instance steel, aluminum, air mobility) but **with a significantly lower carbon content** (decarbonize core and hard-to-abate GHG emissions). Essentially, one offers the same end-product or service but with reduced emissions. It results from **greater efficiency, new process, technologies or raw materials/feedstocks changes**. It involves dedicated investments in new assets/equipment, process reshuffling as well as dedicated R&D and often ad hoc HR/skills management

What are the activities concerned ?

There is enormous potential for emissions abatement in high emitting industries. As was expounded when we discussed the notion of irreplaceability, **some carbon-intensive sectors cannot be directly/instantly phased out because there are neither existing nor viable substitutes**. Hence the emissions from affected activities and processes need to be deeply decarbonized during their operating life in order to align with climate trajectories.

Three segments to decarbonize



Example of new technologies to decarbonize

Hydrogen-based direct iron reduction for primary steel production could allow for substitution from coal or natural gas to electricity – if the hydrogen is green (generated from electrolysis). Prevailing industry and expert views suggest that 100% electrolytic hydrogen-based steel production is not sufficiently advanced to allow for economic potential to be exploited before 2030.

Hydrogen fuel could become an attractive option to indirectly electrify industrial high-temperature heat, either *via* direct combustion or blending with natural gas.

The electrification of clinker production using induction or microwave heat, though such technology is at the laboratory stage.

Electro-technologies for process heat, such as infrared and ultraviolet heating, induction melting, and electric boilers offer further potential for electrification across a range of industrial activities.

LIMITS: THE RISK OF THE REBOUND EFFECT

This “rebound effect” (Binswanger, 2001, Brookes, 1990, Khazzoom, 1980, Saunders, 1992) states that **increased energy efficiency often leads to increased energy consumption**.

Although the energy consumption at the micro level (for the individual) goes down, overall energy consumption at the macro level (for societies) increases due to the combined increase in use from all individuals and demographic growth. The rebound effect is particularly relevant for changing towards more sustainable lifestyles - suggesting that it is not sufficient to improve technology without considering behaviour.¹

¹UK Research and Innovation (2007), The rebound effect report ([available here](#))

Focus on energy efficiency

Energy efficiency is considered as the most important lever for industry decarbonization

The IEA estimates that efficiency measures can make out **37% of the decarbonization potential of the Sustainable Development Scenario** compared to the baseline Stated Policies Scenario.

As highlighted by the IEA (see interview “The instrumental role of industry decarbonization in IEA’s sustainable development scenario”):

“There is no single or simple solution to reach these [climate] goals. Instead, a variety of technologies and policy measures need to be pushed to reach sustainability targets.

The largest near-term options are in energy efficiency, material efficiency and fuel switching”. Both energy efficiency and fuel switching reduce oil and coal consumption by almost a third in 2050, with electricity, natural gas and bioenergy stepping in as substitutes and some use of hydrogen in the iron and steel industries, where pilot projects start around the mid-2020s”.

Source: IEA World Energy Outlook 2019, Table 7.6

Summary of material efficiency strategies in the Sustainable Development Scenario

Design	Manufacturing	Use	End-of-life
Overview			
<ul style="list-style-type: none"> Lightweighting. Reduce over-design, optimise design. Design for use, long life and reuse. 	<ul style="list-style-type: none"> Reduce material losses. Reduce material overuse. 	<ul style="list-style-type: none"> Lifetime extension and repair. More intensive use. 	<ul style="list-style-type: none"> Remanufacture and repurpose. Direct material reuse. Recycle.
Steel			
<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Vehicle lightweighting. <input checked="" type="checkbox"/> Building design, reduce over-specification and concrete-steel composite construction; modular design for future materials reuse. 	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Improve steel semi-manufacturing and end-use product manufacturing yields. 	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Use buildings for longer through refurbishment. <input checked="" type="checkbox"/> Mode shift to reduce the number of vehicles being produced. 	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Direct reuse of steel (with highest potential in specific end-uses such as ships). <input checked="" type="checkbox"/> Recycle.
Cement			
<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Building design, reduce over-specification and concrete-steel composite construction; modular design for future materials reuse. 	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Improved construction, including reducing onsite construction waste, reducing cement content in concrete and pre-cast fabrication. 	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Using buildings for longer through refurbishment. 	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Concrete reuse.
Aluminium			
<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Vehicle lightweighting (steel-aluminium substitution) offsets some reductions from other strategies. 	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Improve aluminium semi-manufacturing and end-use product manufacturing yields. 	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Mode shift to reduce the number of vehicles being produced. 	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Direct reuse of aluminium. <input checked="" type="checkbox"/> Recycle.
<input checked="" type="checkbox"/> High potential <input checked="" type="checkbox"/> Medium potential <input checked="" type="checkbox"/> Low potential <input type="checkbox"/> Increase in demand			

Overview of low carbon innovations for brown industries

Sector	Technology	Type of innovation: Incremental (I) or Radical (R) and technical description	Maturity*	GHG Benefits	Diffusion bottlenecks
All energy-intensive processing industries	Energy efficiency	I/R - Reduce energy consumption through best available technologies in steam, motor, heat pump and combined-heat and power systems	All	Less energy and CO ₂ (+)	Costs, lack of awareness and expertise
	Material Efficiency & Recycling	I/R - Reduce the (primary) material intensity of supplying material services through improved product design, product re-use, high-quality recycling, and different business models; includes cross-sectoral symbiosis products	All	Resource efficiency less CO ₂ (++)	Low resource vs. high labor costs, requires organizational and technical innovation, lower quality materials
	Carbon Capture and Storage Technologies (CCS)	I/R - Typical end of the pipe technology, can be incremental, but typically needs significant additional space and technology for integration in process design, which can make it radical; needs infrastructure to transport captured CO ₂	Up to 6	Less CO ₂ (++)	Additional energy demand, costs, infrastructure, acceptance by local public

The iron & steel sector's technology options

Sector	Technology	Type of innovation: Incremental (I) or Radical (R) and technical description	Maturity*	GHG Benefits	Diffusion bottlenecks
Iron and Steel	Recirculating Blast Furnace & CCS	R - Currently under R&D (e.g., ULCOS project) needs high integration into existing plants which might need major changes in plant / site setup	4–5	Less CO ₂ (++)	Higher energy demand, costs, infrastructure, acceptance
	Smelt reduction & CCS	RR - Makes obsolete coke ovens, BF & BOF of conventional steel factories	3–4	Less CO ₂ (++)/ (+++)	Costs, infrastructure, acceptance
	Direct reduction with H ₂	RR - Makes obsolete coke ovens, BF & BOF of conventional steel factories, but is combined with electric arc furnace; needs H ₂ supply infrastructure	3–4	Less CO ₂ (+++), potentially excess electricity converted to H ₂	Costs, infrastructure & technology
	Electrowinning	RRR - Makes obsolete coke ovens, BF & BOF of conventional steel factories, needs large electricity supply; technology only on lab scale available	2–3	Less CO ₂ (+++ with RES electricity) smaller, probably lower CAPEX	Only available in lab; low coal/CO ₂ - prices and high electricity prices
Aluminum	Advanced (inert) anodes	I - Avoids oxidation and consumption of anodes and the CO ₂ emissions resulting from this	3–4	Less CO ₂ (++) , lower energy demand	Availability of technology, research needed

The example of the shipping industry

Shipping is a key enabler of international trade, accounting for about three-quarters of total freight transport activity. It is also the most energy-efficient way to carry cargo in terms of energy use per ton-kilometer (tkm).

However :

- The shipping industry accounts for around **2.5% - 3% of global CO₂ emissions** according to the IEA.
- The sector's emissions are estimated to **grow around 50% to 250% by 2050** according to different economic and technological innovation scenarios.

Technologies to decarbonize the sector

Hull
shape
design

Sails

Kits

Turbines

Alternative
fuels*

No specific technological solution makes consensus over the entire industry. However, small boats are likely to adopt electric propulsion or hydrogen fuel cells. For long distances and larger boats, ammoniac and hydrogen as a fuel, biofuels and synthetic fuels are considered as credible options.

Initiatives to reduce shipping industry's emission

Year	Recent environmental initiatives
2011	<p>2 international standards developed to improve energy efficiency:</p> <ul style="list-style-type: none"> • Energy Efficiency Design Index (EEDI) • Ship Energy Efficiency Management Plan (SEEMP)
2018	<p>107 members of the International Maritime Organization (IMO) adopted the industry's premier strategy on reduction of GHG emissions:</p> <ul style="list-style-type: none"> • By 40% by 2040 against a 2008 baseline • By 70% by 2050 against a 2008 baseline
2019	<p>100 chief executives in the maritime sector joined with 9 NGOs called the IMO for speed reduction for ships.</p> <ul style="list-style-type: none"> • Estimates show this could reduce fuel consumption by 18% if limited from 12 to 11 knots
2020	<p>The IMO created the global sulphur cap:</p> <ul style="list-style-type: none"> • It requires shipping vessels to either use maritime fuels with a maximum sulphur content of 0.5% or install a scrubber to comply with sulphur dioxide emissions regulations.

Assessment of shipping companies by CDP

- CDP assesses the **operational and technical efficiency of companies' fleets** and how their vessel purchasing decisions affect this.
- It analyzes the **capital flexibility of companies** and assesses their **exposure to longer-term market risks for transported commodities**.
- Capital flexibility means companies may be less agile and slower to mobilize in response to future disruption such as climate regulation.

League Table rank	Company	Ticker	Stock exchange	Market Cap Average FY 2018 Q4 (US\$bn)	Weighted rank	Transition risks rank	Transition opportunities rank	Climate governance & strategy rank	Fleet breakdown (%)
1	NYK Line ^(a)	9101 JP	TSE	3.4	4.89	3	1	2	
2	A.P. Moller-Maersk	MAERSKA DC/ MAERSKB DC	CSE	25.3	5.03	6	2	1	
3	Mitsui O.S.K ^(a)	9104 JP	TSE	3.5	6.53	1	3	6	
4	K Line ^(a)	9107 JP	TSE	2.2	7.43	5	4	3	
5	HMM	011200 KS	KRX	1.0	8.87	7	8	4	
6	Norden	DNORD DC	CSE	0.6	9.34	9	9	5	
7	OOIL ^(a)	316 HK	HKEX	6.0	10.15	11	5	9	
8	U-Ming	2606 TT	TWSE	0.9	10.24	2	10	11	
9	Hapag-Lloyd	HLAG GR	FWB	4.5	10.32	4	6	14	
10	Wan Hai	2615 TT	TWSE	1.2	11.26	12	12	8	
11	Evergreen Marine	2603 TT	TWSE	1.8	11.55	17	7	12	
12	COSCO S.H ^(a)	601919 CH/1919 HK	SSE/HKEX	5.4	11.91	8	11	16	
13	Yang Ming	2609 TT	TWSE	0.7	12.40	10	13	15	
14	Pacific Basin	2343 HK	HKEX	0.9	12.46	16	14	10	
15	Teekay	TK US	NYSE	0.3	12.58	18	16	7	
16	Euronav	EURN BB	BXS	1.6	12.72	15	17	13	
17	NS United KK	9110 JP	TSE	0.5	13.86	14	18	17	
18	COSCO S.ET	600026 CH/1138 HK	SSE/HKEX	2.4	13.94	13	15	18	

Weighting

35% 30% 35%

Source: CDP, Shipping Report

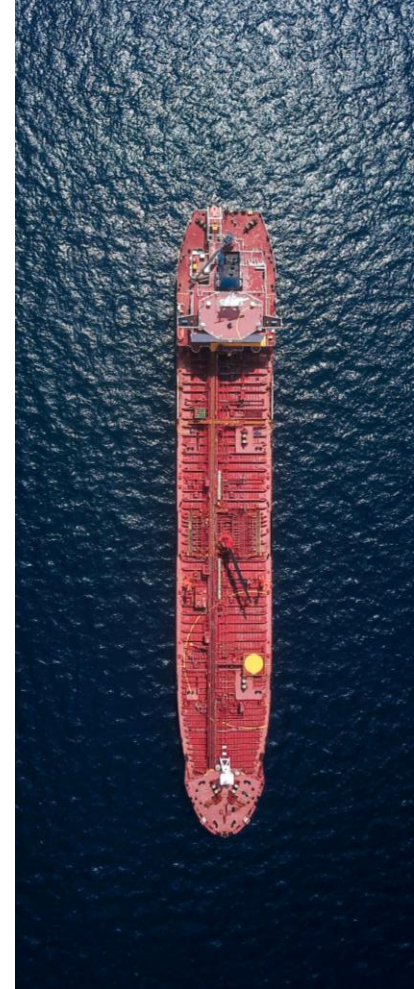
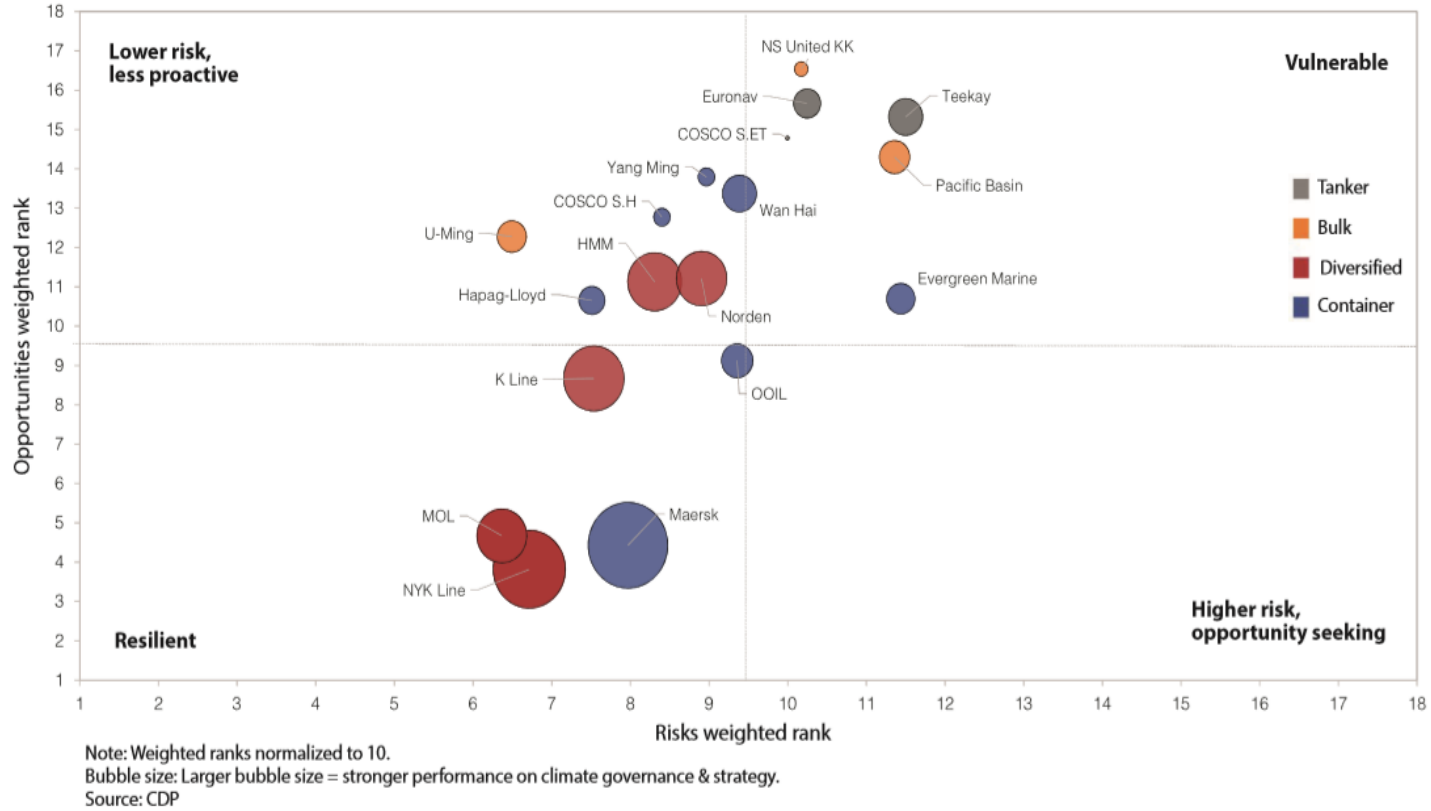


FIGURE | Opportunity vs. risk for low-carbon transition



Maersk's strategy to decarbonize its core activities

Maersk is the world's largest container shipping company. 65% of its GHG emissions come from its own transportation activities (Scope 1). Its main levers to decarbonize are fuel changes and efficiency measures. As of today, there is no substitute at scale to high-sulphur fuels. Maersk recognizes that massive innovation efforts and fuel transformation are necessary in the 5 to 10 years to come. The company has already reduced substantially its emissions at the cost of \$1 billion so far. **It has an intermediate goal to cut absolute emissions by 60% by 2030 (relative to 2008 levels) and aims to be carbon neutral by 2050.**

EXIT

A.P. Moller-Maersk spun off its oil and gas drilling unit in April 2019 after having sold its oil exploration and production business to Total in 2017

DIVERSIFY

Nothing on diversification as the company remains a freight transport provider. We might note that the company is restructuring. Maersk is splitting its freight forwarding and supply chain services subsidiary Damco into two entities.

DECARBONIZE CORE ACTIVITIES

Maersk is decarbonizing its core activities through the use of biofuels, efficient management of its fossil fuel consumption and the development of new carbon-neutral propulsion technologies.

OFFSET

Not mentioned

PROVIDE DECARBONIZATION SOLUTIONS

It strives to provide low-carbon transportation (see Maersk - H&M pilot project: the carbon neutral project, using biofuel saving 85% absolute emissions compared to bunker fuel)

In a nutshell

- **Is it ambitious?** Making a highly emissive activity carbon neutral by 2050 is ambitious. Further, it has an intermediate goal to cut absolute emissions by 60% (relative to 2008 levels) by 2030.
- **Is it consistent?** As the company is not diversified across different services, the consistency of disparate actions or initiatives is a less material criteria (although it sold its oil exploration and production business). The company puts an ambitious long-term target but seems quite uncertain on how to reach it.
- **Is it game changing?** Yes, as Maersk is willing to convince the whole industry to follow its journey towards low carbon transportation. It paves the way for ambitious industry transformation. By calling the entire industry to collaborate and invest in R&D toward carbon neutrality, the biggest player of container maritime transportation tends to reinforce its leading position and accompany change through the entire industry.
- **Is it enough?** Well, targets are climate-science aligned but quite uncertain in their achievability. The steepness of the decarbonization curve after 2040 reflects the uncertainty linked with a breakthrough innovation

Source: Maersk reports

FIGURE | Worldwide steady demand led to growing absolute GHG emissions (1990-2016)

	1990	2016
Cement production	1.1 Gt	4.2 Gt
Direct CO ₂ emissions	1.0 Gt	2.2 Gt
Carbon intensity (in kgCO ₂ per ton of cement)	91%	54%
Cement industry's share of global greenhouse gas emissions	2.8%	7%

Cement production is currently the third largest source of CO₂ emissions in the world, after fossil fuels & changes in land use.

FIGURE | Trends in cement production and emissions between 1990 and 2016 (in Mt), then in 2030 and 2050 in IEA 2DS

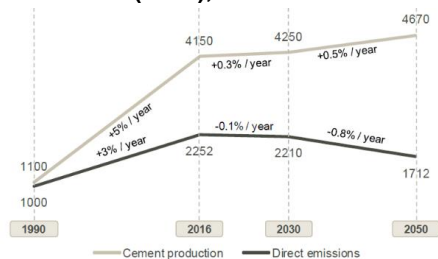


Chart 9- Source: CDP and IEA, reproduced by ODDO BHF Securities

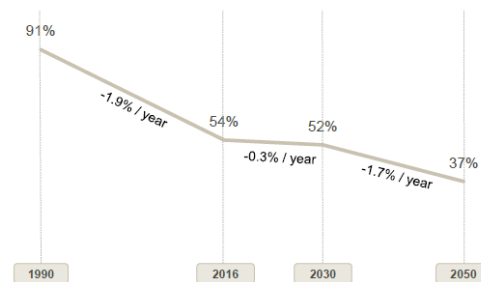
A clear decoupling is necessary between production and direct emissions.

FIGURE | Global average performances (2018) and 2030 and 2050 targets (IEA, 2DS)

Indicator	Global average	2030 target	2050 target
Captured emissions (MtCO ₂ /year)	0.3	14	552
C/K ratio (%)	66%	64%	60%
Alternative fuel rate (%)	6%	18%	30%
Thermal intensity of the clinker (in GJ/t clinker)	3.4	3.3	3.2
Carbon intensity (kg CO ₂ net/t cement)	540	520	370

2DS carbon intensity annual average reduction stands at 1.1% between 2016 and 2050.

FIGURE | Carbon intensity between 1999 and 2016, and between 2016 and 2050 in the 2DS scenario



The acceleration in the decarbonization effort after 2030 is not really substantiated (a carbon pricing of ~100€, more realistic by this time, is expected to spur demand for low-carbon products and R&D efforts). In the industry, investment cycles are long, upfront costs high and innovation limited (low product differentiation).

This case study is largely based on the report from ODDO SRI Research (published on 24.06.2019) and titled "Cement industry facing the decarbonization challenge in the 2° scenario". We are grateful to the lead author of this publication, Jean-Baptiste Rouphael (Tel. : + 33 (0)1 55 35 42 44 jean-baptiste.rouphael@oddo-bhf.com).

LafargeHolcim's endeavor to decarbonize cement production

Steady demand led to growing absolute GHG emissions (1990-2016)

LafargeHolcim emitted **561 kgCO₂/ton of cementitious product in 2019** (a 27% reduction compared with 1990 and a 1,4% reduction compared with 2018).

It has an objective of 550 kg CO₂/ton in 2022 and a revised target of 475 kgCO₂/ton in 2030, i.e. -38% compared to the 1990 level (the previous objective of 460 kg CO₂/ton in 2030, i.e., -40% compared to 1990, was lowered).

The EU Taxonomy Draft Delegated Acts threshold (only Scope 1 emission) was set at 498kgCO₂/t. The new Delegated Acts threshold is the average value of the top 10% of installations based on the data collected in the context of establishing the EU Emissions Trading System (EU ETS) industrial benchmarks for the period of 2021-2026.

The company has one of the lowest clinker ratios (72%), thanks in particular to its Indian subsidiary Ambuja (66%).

It outperforms several of its European peers but is behind Asian competitors that benefit from byproducts to lower their clinker ratio.

FIGURE | CO₂ intensity of European cement makers in 2018 (kgCO₂/t of cement) & 2016-2018 average annual growth

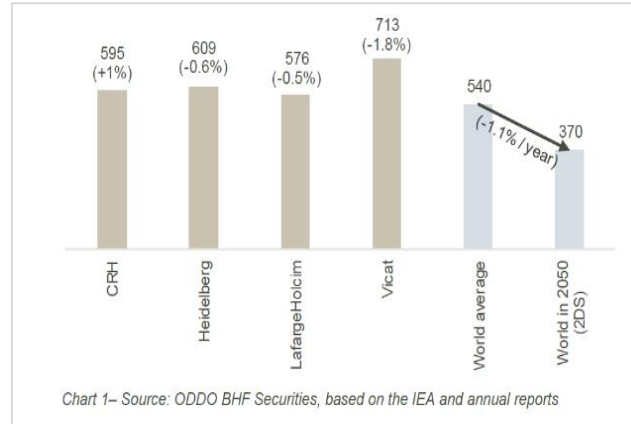
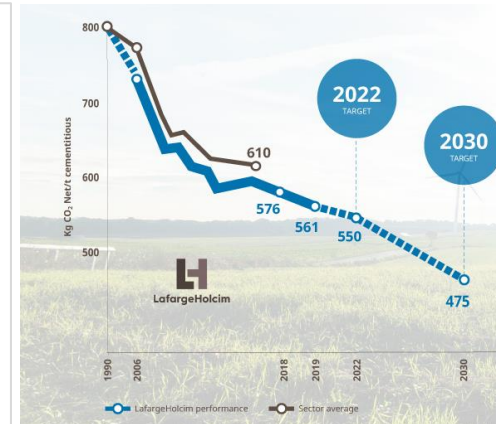


FIGURE | LafargeHolcim's 2022 and 2030 targets



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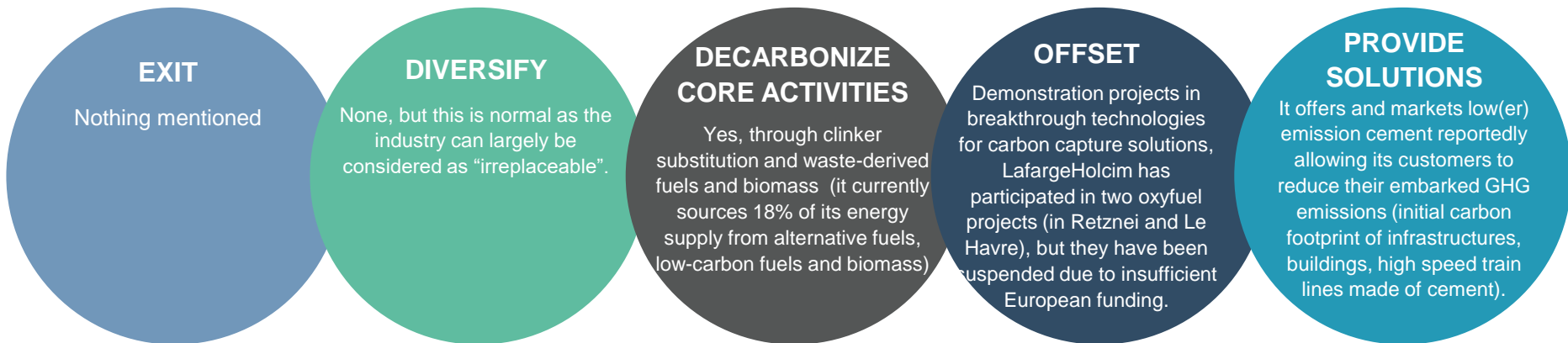
LafargeHolcim's endeavor to decarbonize cement production



LafargeHolcim

The downwardly revised target for 2030 remains 2DS aligned, answering the legitimate question whether the set targets are “enough” from a climate science standpoint.

LafargeHolcim considers multiple scenarios according to potential regulatory developments (high, medium and low variability of regulatory incentives). The company reportedly supports and follows the recommendations from the TCFD. Its subsidiary Ambuja is a member of the Science-Based Target Initiative (SBTi). As a backdrop in 2018, the EU Commission revised its EU-ETS directive to increase the pace of emissions reduction. The total number of quotas will decrease by 2.2%/year starting 2021 against 1.74% now. According to CDP, the company has an internal carbon price >€ 30/t of cement (vs. Vicat: 30€; HeidelbergCement: 20-30€; CRH:15-25€).



Focus on “decarbonize core activities” lever

The main transition lever for the cement industry is unarguably to “decarbonize core emissions”. This is because it is a basic material that is largely irreplaceable by its use in various forms of infrastructures such as housing, water distribution network, public transportation, etc.

Process CO₂ emissions and thermal energy emissions account respectively for 50% and 30% of the total GHG emissions generated from the production of one ton of standard Portland cement. The major intervention needed to curb these emissions would be to focus on improving process efficiency and electrifying most operations, but there is currently limited room for the application of electrification as it cannot efficiently produce the high temperature heating (>1450°) required.

Source: Engie's company report

LafargeHolcim's endeavor to decarbonize cement production



LafargeHolcim

KPIs Selection & calibration

Most compelling is that climate benchmarks for a 2°C scenario in the cement industry are not only available for carbon intensity per ton of cement but also for more granular phases of the production (breakdown between process CO₂ emissions and thermal energy emissions).

When looking at competitors and targets calibration assessment, there is one main reason explaining the better performance of Asian cement manufacturing plants compared with European or American ones: lower clinker to cement ratio thanks to byproducts of steel and coal industries.

Synthetic KPIs

Carbon intensity (kgCO₂/ton of cement)

- LafargeHolcim 2018: **576**;
- World average: **540**;
- World in 2DS in 2050: **370**;
- Existing targets for 2022: **560**
- Existing targets for 2030: **520**.

“**Low-carbon products**”: share of sustainable solutions (% of net sales in 2018), but the impact is captured through the previous KPI.

Sub-KPIs

Cement to clinker ratio (C/K ratio) as a percentage

LafargeHolcim: 72% in 2018; world average: 66% and world in 2DS in 2050: 60%

Recycling and circularity: in 2018, it reused 52 million tons of waste materials in its operations, the target for 2030 is set at 80 million tons.

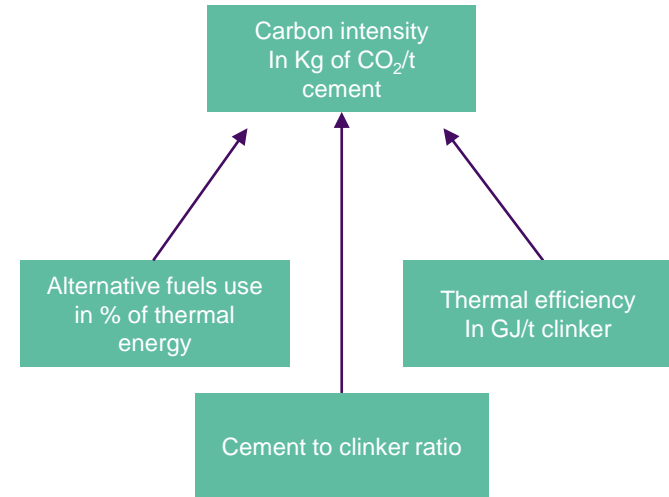
Thermal intensity

(GJ per ton of clinker): LafargeHolcim: 3.52 in 2018; world average 2015: 3.40; world in 2DS in 2050: 3.20.

Rate of alternative fuels

(as % of thermal energy): LafargeHolcim: 18% in 2018; World average: 6% ; World in 2DS in 2050: 30%

CHART | Main carbon performance indicators



Case study: aviation

FIGURE | Aviation industry's climate footprint

3%

The sector accounts for around 2.5-3% of GHG emissions globally excluding the effects of radiative forcing (*source: IEA*)

+70%

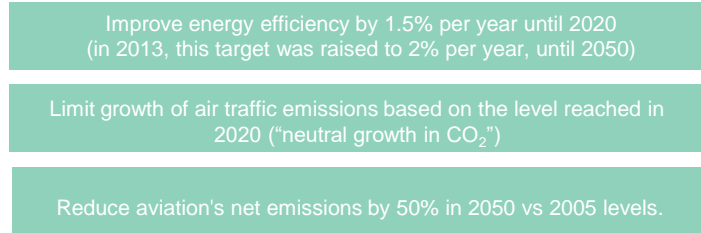
The sector's fuel efficiency has improved by 70% over the past two decades.



The greenhouse gases emissions of the sector is notably influenced by the **rebound effect**. The world annual traffic doubled between 2003 and 2018 from 4 trillion Revenue Passenger Kilometer (RPKs¹) to 8 trillions RPKs (*source: ICAO²*).

4.3 billion passengers (6.4% increase year-on-year) and 58 million tons of freight (2.4% increase year-on-year) were carried by airlines worldwide in 2018 (*source: ICAO²*).

FIGURE | The International Air Transport Association (IATA³) set out three climate targets



Source: [Aviation benefits beyond borders](#)

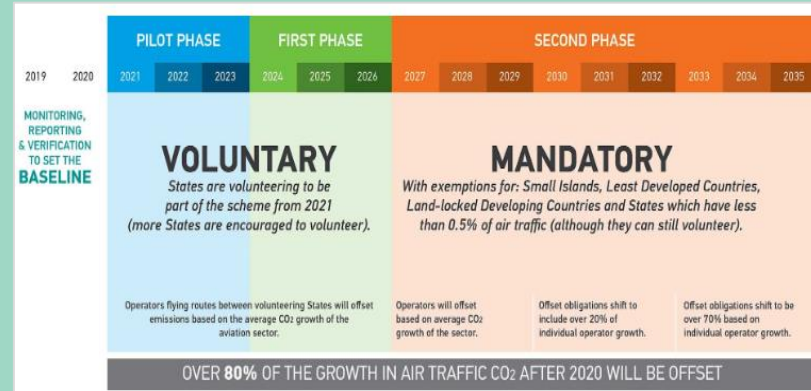
1. Revenue passenger kilometers (RPK) : one revenue passenger-kilometer means that one passenger is carried on one kilometer
2. International Civil Aviation Organization (ICAO) is an agency of the United Nations
3. The International Air Transport Association (IATA) is a trade association of the world's airlines founded in 1945. It has been described as a cartel since, in addition to setting technical standards for airlines, IATA also organized tariff conferences that served as a forum for price fixing

NEW STANDARDS & AMBITIONS

The ICAO adopted the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) in 2016. CORSIA is a global regime of market-based measures designed to offset the fraction of CO₂ emissions from international flights exceeding their 2020 level. It requires operators of subject aircraft to purchase carbon credits.

- Aims at reducing almost 2.5 billion tons of CO₂ between 2021 and 2035
- Proceeds from CORSIA could mobilize over \$40 billion in climate finance between 2021 and 2035

Timeline for the implementation of CORSIA



Airline companies' target emissions

- Airlines like Qantas and SAS have set CO₂ emissions reduction targets.
- They both committed to reduce net CO₂ emissions with 50% by 2050 (2005 baseline). SAS has set an intermediary target, aiming to reduce total emissions by 25% by 2030.
- Aircraft and engine manufacturers, such as Airbus and Safran, are developing low-emission aircrafts and propulsion systems compatible with sustainable fuels, contributing to the transformation of the industry.

FIGURE | Aviation targets in term of intensity emission reduction

Targets (gCO ₂ /RTK)	2019	2024	2025	2030
Turkish Airlines	660	643	640	N/A
IAG	628	572	562	N/A
Etihad Airways	631	574	559	N/A
International Pledges scenario (ICAO)	643	576	559	N/A
2°C scenario (TPI)	624	539	522	430

Source : Green & Sustainable Hub, see our article about [Etihad's \\$600 million Sustainability-linked Sukuk: the first of many things](#)

EXAMPLE OF ETIHAD AIRWAYS

Etihad Airways, the Abu Dhabi flag carrier, has launched **the first sustainability-linked bond in aviation** in October 2020. The Sustainability-linked bond is tied to one Key Performance Indicator (KPI): a reduction of 17,8% of the emission intensity of its passenger fleet by 2024, against a 2017 baseline of 574 CO₂/Revenue ton kilometers (RTK) for the total fleet.

Etihad Airways has also announced its **willingness to achieve Net-Zero Carbon emissions by 2050** (Scope 1 & 2) and a 50% reduction in net emissions by 2035 in a Sustainability Position Paper published in January 2020, which is more ambitious than the latest IATA target (i.e., **50% reduction in net aviation CO₂ emissions by 2050**, relative to 2005 levels).

Even though Etihad Airways' 2025 targets for its emission intensity (in gCO₂/RTK) are aligned with the sector's currently defined targets with the International Pledges scenario's 2030 target, they are not in line with 2°C scenario targets. According to the TPI (which uses a science-based methodology to assess companies' alignment to the Paris Agreement's 2°C scenario), companies' carbon intensity should not be above 539 gCO₂/RTK in 2024 and 522 gCO₂/RTK in 2025 and have to reach 430gCO₂/RTK in 2030 to be aligned with a 2°C scenario.

In 2019, Etihad Airways' carbon intensity was at 631 gCO₂/RTK in 2019 and is expected to be at 636 gCO₂/RTK in 2020.

As a reminder, the International Pledges scenario is based on current commitments made by the International Civil Aviation Organization (ICAO) and these commitments are known to be insufficient to set the aviation sector on a pathway compatible with the world of 2°C warming or below, as aimed for by the Paris Agreement.

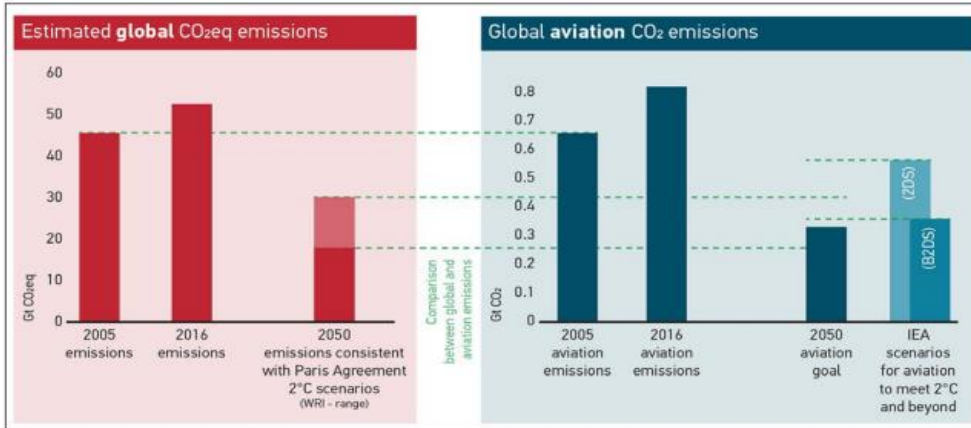
Transition levers for aviation

The aviation industry is a hard-to-abate sector with few substitutes, as time savings from this transport cannot be matched by alternative modes of transport. The solution for most of the industry players seems to be the **decarbonization of their core activities**.

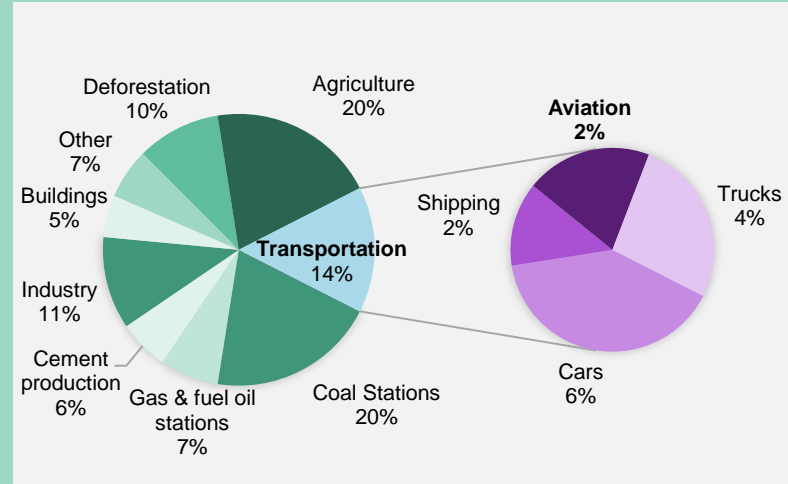
Four decarbonization entry points have been identified for curbing emissions in aviation:

1. Operating efficiency
2. Innovative technologies
3. Sustainable energy fuels
4. Carbon offsetting

FIGURE | Global emissions reduction based on Nationally determined contributions under COP 21 vs Aviation Carbon emissions based on industry target



AVIATION'S SHARE IN GLOBAL GHG EMISSIONS (2018)



Source: ODDO BHF Corporates and Markets (2019) Aviation: CO₂ - a threat to the industry's licence to grow

For distances above 800kms. In non-land locked countries, road transport is more competitive for distance under 200 km while depending on the speed of the train, rail can compete and surpass aviation in terms of door-to-door transport for distances comprised between 200 and 500 km.

Transition levers for aviation explained



Levers	Solutions	Potential contribution (ICAO)	Lifecycle CO ₂ emissions reduction per aircraft in % (IEA)	Availability & potential year of introduction	Examples & Initiatives
Innovative technologies	Innovative aircraft technologies <ul style="list-style-type: none"> Electric/hybrid aircrafts 	Notable impact as the operation of electric or hydrogen aircraft will not be associated with CO ₂ emissions from fuel combustion. However, life cycle benefits also depend on whether the electricity or hydrogen is obtained from lower carbon sources	Next-generation aircrafts: 30-70%	Airbus E-Fan X (hybrid electric demonstrator) ready to fly in 2021, ambition to bring hybrid or fully electric technology with up to 100 sets in the 2030s ~2035	Airbus' E-Fan X single-aisle aircraft is said to have a 2MW electric motor and three turbo-generators for a 100-seater craft, while an American start-up Wright Electric claims that it has filed a patent for a 50-seater all-electric aircraft.
Carbon offsetting	Market-based measures (CORSIA) – emission increases from international flights will have to be compensated for through carbon offsets	Complements the other measures by offsetting the CO ₂ emissions that cannot be reduced through use of technological improvements, operational improvements and SAFs with emission units from the carbon market		Pilot phase 2021-2023 First phase 2024-2026 Second phase 2027-2035	None

¹¹ A320neo family The Airbus A320neo family (neo for new engine option) is a development of the A320 family of narrow-body jet-airliners produced by Airbus. Launched on 1 December 2010, it made its first flight on 25 September 2014 and it was introduced by Lufthansa on 25 January 2016. It is declared to be 15% to 20% more fuel efficient than the A320ceo family. A key contributor to the NEO's performance is Sharklets – which were pioneered on the A320ceo (current engine option). These 2.4-metre-tall wingtip devices are standard on NEO aircraft, and result in up to four per cent reduced fuel burn over longer sectors, corresponding to an annual reduction in CO₂ emissions of around 900 tonnes per aircraft.

Transition levers for aviation explained



Levers	Solutions	Potential contribution (ICAO)	Lifecycle CO ₂ emissions reduction per aircraft in % (IEA)	Availability & potential year of introduction	Examples & Initiatives
Operating efficiency	<p>More efficient operations</p> <ul style="list-style-type: none"> Route optimization Increasing occupancy rate and freight load factor Onboard weight reduction Fleet renewal New-generation aircrafts (e.g. A320NEO) 	<p>Even under the most optimistic scenario, ICAO estimates long-term fuel efficiency improvements to be 1.37% per annum. 0.98% and 0.39% from technology and operations respectively. This is lower than ICAO's goal of 2% per annum.</p> <p>The IEA states that fast-tracking the renewal in the global fleet could reduce aviation's carbon footprint by nearly 10% by 2030.</p>	<ul style="list-style-type: none"> Air traffic management improvements: 5-10% Increasing utilization: 3% Early replacements of old aircrafts: 1-9% Retrofitting existing aircrafts: 4-5% Engine retrofits: ~15% New-generation aircrafts: 15% 	<p>Existing technology/ solutions, can be introduced in the short-term</p> <p>~2018 - 2025</p>	<p>Safran for example has developed an e-taxing system (unit cost is EUR1 million) that reduces fuel expenditure per flight by 4%.</p>
Sustainable energy fuels	<p>Sustainable aviation fuels (SAFs)</p> <ul style="list-style-type: none"> Biofuels Power-to-liquid <ul style="list-style-type: none"> LNG Hydrogen Electrofuels 	<p>In the short term, 2020 scenarios result in a fuel replacement rate up to 2.6% and GHG emissions reduction up to 1.2%. Until 2050, SAFs are estimated to have the potential to achieve 19% net CO₂ emission reduction.</p> <p>The share of hybrid solutions in the aviation sector is not expected to become a significant share of worldwide commercial traffic until 2050 according to ODDO BRH.</p>	<p>Synthetic fuels: 13-26%</p> <p>Note: current biofuel consumption is minimal and insufficient, compared to IEA's Sustainable Development Scenario – 10% of fuel demand in 2030</p>	<p>Certain technologies need to reach industrial scale production. Others (e.g. hydrogen, non-drop-in) still in development</p> <p>~2020</p>	<p>HEFA (Hydroprocessed Esters and Fatty Acids), also called HVO (Hydrotreated Vegetable Oil), is a renewable diesel fuel that can be produced from a wide array of vegetable oils and fats. It has a direct carbon footprint that's about half that of jet fuel (40-50g CO₂/MJ vs 89g CO₂).</p> <p>The European Union revised the regulation on biofuels' footprint in the REDII directive. It is being advocated that the industry focuses on the development of biojet fuel based on non-food crop. HEFA for example is made from animal fats, recovered oils and vegetable oils and it has a direct carbon footprint that's about half that of jet fuel (40-50g CO₂/MJ vs</p>

¹⁴ A320neo family The Airbus A320neo family (neo for new engine option) is a development of the A320 family of narrow-body jet-airliners produced by Airbus. Launched on 1 December 2010, it made its first flight on 25 September 2014 and it was introduced by Lufthansa on 25 January 2016. It is declared to be 15% to 20% more fuel efficient than the A320ceo family. A key contributor to the NEO's performance is Sharklets – which were pioneered on the A320ceo (current engine option). These 2.4-metre-tall wingtip devices are standard on NEO aircraft, and result in up to four per cent reduced fuel burn over longer sectors, corresponding to an annual reduction in CO₂ emissions of around 900 tones per aircraft.

Initiatives to manage air-transport demand

Airlines companies' initiatives on “flying responsibly”



The Dutch flag-carrier (a subsidiary of the AirFrance-KLM Group) launched its “Fly Responsibly” campaign encouraging people to avoid unnecessary flights and rather use alternatives such as trains when possible since June 2019.



Hungarian low-cost airline Wizz Air, calling on the industry to place a “ban on business class travel for any flight under five hours”.



Norwegian has decided not to offer business class, claiming that this makes it one of the most climate efficient airlines in the world.

Regulatory attempts by Governments to rein in demand

- The Netherlands, Belgium, Luxembourg, Sweden, Germany, Denmark, France, Italy and Bulgaria – released a joint statement in November 2019, calling on the incoming European Commission to “debate aviation pricing, e.g., in the form of aviation taxation or similar policies”.
- France had earlier announced an eco-tax on all flights departing the country as a way to raise funds that would finance other modes of transportation.

A DEMAND SIDE APPROACH IS NECESSARY

Comparing aviation against various criteria such as **end-use, substitutability and fairness of access**, the inconvenient truth could be that demand for air travel and freight needs to be contained, or even gradually reduced.

As much as it is necessary to encourage operational efficiency, new technologies and the use of cleaner fuels, **it is crucial to keep in mind the possible “rebound effect”** that could arise should the efficiency gains be passed on to the end-customers.

According to Airbus’ Global Market Forecast 2018, an important driver of air travel demand is the “wealth effect” and the overall increase in disposable income. **More than 75% of air travel is for private and leisure purposes**, illustrating how air travel is **more of a luxury than a basic need**.

END-USE SUBSTITUTES FOR AIR TRAVEL & AIR FREIGHT

- **Video-conferencing** can reduce the need for business travel (as evidenced by the COVID-19 pandemic)
- **Domestic air travel or short-haul flights** can be replaced by high-speed railways in non-land-locked or flat geographies with a sufficient demand for transport.
- International tourism, which is a luxury, can be replaced **by local tourism**.
- Certain cargoes can be transported *via* ground or sea transport, which may take longer but is much less emissive.

This is where the “Quit/Exit” lever may enter the toolkit available to the aviation sector for its transition. It goes without saying that **the complete phase out of certain end uses is highly unlikely, and that any reduction is not going to happen overnight**.

Lever #4 | Offset emissions

What does offsetting mean ?

A carbon offset is a compensation of carbon dioxide or GHG emissions resulting from a production or a consumption process. Usually, offsetting is a way to pay for carbon emissions either by buying/selling the right to emit (quotas) under regulatory constraint or by purchasing tradable carbon unit that are project-based. It means that emissions are supposedly reduced somewhere else thanks to the offset.

Companies claim to compensate their missions with carbon dioxide removal solutions by deliberate human activities (e.g., Carbon Capture Sequestration, reforestation), in addition to the removal that would occur *via* natural carbon cycle processes.

Emission Trading Scheme (ETS)

Regulatory ETS

- **Offsets can be bought on carbon markets such as the EU Emission Trading Scheme (EU-ETS)** in order to comply with regulatory caps on the total amount of CO₂ companies are allowed to emit.
- The EU-ETS is based on emission quotas distribution and not backed by projects allowing for material emissions reductions. It is seen as a financial incentive to reduce companies' carbon emissions.
- The greater the cost of CO₂ the less profitable becomes the polluting asset

Voluntary ETS

- **Offsets can be purchased on a discretionary basis, on the voluntary market** to mitigate companies' own GHG emissions.
- As carbon accounting is becoming mainstream, companies are looking for ways to "reduce" their carbon footprint
- **Compensation is often used for marketing purposes** but also to anticipate upcoming regulations.
- The use of offsets is not counted as reductions toward the progress of companies' science-based targets.
- On voluntary markets, **offsets are certified by third-parties according to different standards**
- Voluntary offsets are not yet regulated by any international body but methodologies to comply with basic criteria emerge

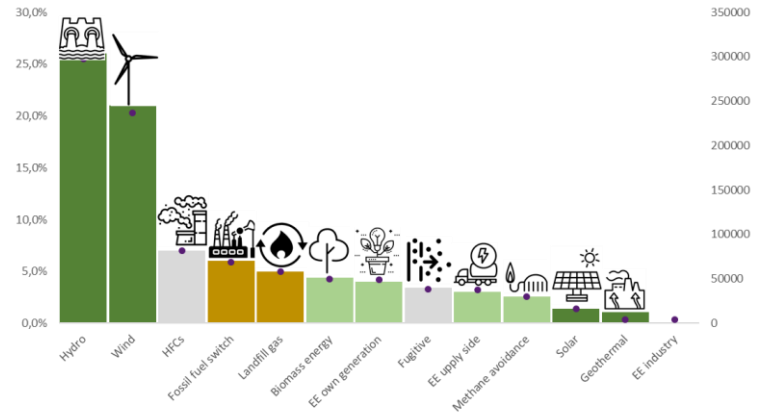
Focus on the Clean Development Mechanism (CDM)

The CDM was created as part of United Nations' Kyoto protocol in 1995

- \$215bn investment in CDM projects in developing countries
- 1bn tons of CO₂ equivalent mitigated since 2004 (Germany's annual GHG emissions = removing 180 million passenger cars from the road)
- 5000+ projects registered
- 4500+ organizations involved in the CDM
- Its carbon credits are allowed to be traded on the South Korean ETS, and can also be credited as carbon tax in Mexico and Colombia

Once approved by the clean development mechanism (CDM), a carbon-offset project can be used as carbon credit and linked with emissions trading schemes.

FIGURE | Clean Development Mechanism projects



Source: UNEP DTU

■ Certified emissions reductions/year (%) ● Certified emissions reduction/year (absolute)

Bio-sequestration as an offset lever

Bio-sequestration

Bio sequestration is the capture and storage of the atmospheric greenhouse gas carbon dioxide by continual or enhanced biological processes.

- **2 billion tons of CO₂ absorbed per year thanks to forests** (source: FAO)
- The Global Carbon Project (Carbon budget, 2017) estimates that **forestry could have captured up to 29% of human induced emissions** (between the 2008-2017 period)

How can companies manage bio-sequestration offset ?

- Companies must disclose their methodologies while offsetting so that they can be held accountable and avoid double counting. One way that companies can verify and report their carbon offsetting efforts is through third party certifications.

Main certification standards



Type/standard	Carbon credit name	Credits main users	Projects
CDM. Offset mechanism under the Kyoto Protocol (Article 12) Project-based & Standardized approach	Certified Emission Reductions (CERs)	Countries that have a reduction commitment under the Kyoto Protocol Private buyers that are covered under an ETS (e.g., EU-ETS) Voluntary buyers	
Jl Track 1: Offset mechanism under the Kyoto Protocol (Article 6) Project-based & Standardized approach	Emission Reduction Units (ERUs)	Countries that have a reduction commitment under the Kyoto Protocol Private buyers that are covered under an ETS (e.g., EU-ETS) Voluntary buyers	Renewables, Energy efficiency, Coal mine methane, Waste management, Agricultural manure, N ₂ O abatement, Other industrial gases, Agricultural practice, Afforestation and reforestation
Nonprofit organization Project-based voluntary offset mechanism Approved as a compliance offset project registry for CA cap-and-trade regulation	Verified Carbon Units (VCUs)	Voluntary buyers mainly in the U.S. and Europe Approved Offset Project Registry under the CA ETS	
Nonprofit organization Project-based, voluntary offset mechanism that can be used as add-on certification to CDM and Jl projects or for voluntary projects	Gold Standard Voluntary Emission Reductions (GS VERs) GS CERs for CDM projects GS ERUs for Jl projects	Mostly voluntary buyers GS CERs and ERUs Private buyers that are covered under an ETS Few countries that have a reduction commitment under the Kyoto Protocol	Renewables, Energy efficiency, Waste management, Agricultural manure, Afforestation and reforestation

BIO-SEQUESTRATION OFFSET LIMITS

Time mismatch and permanence of storage

- The offset is expected to happen slowly over a future period of time, while the effects of the CO₂ emitted today has a more immediate impact.
- Climate change makes it even harder for trees to live long and “peaceful lives” as increasing extreme weather events (droughts, wildfires) are increasingly accelerating deforestation growing threats. In this vicious circle, CO₂ should not be emitted in the first place rather than being compensated for.

Controversies & mismanagement

- **Land deprivation:** Offsetting projects could mean privatizing entire territories once used by local populations for subsistence agriculture.
- **Radiative forcing** could be increased by tree plantations at certain latitudes.
- Large-scale bio-sequestration: unintended negative consequences such as the **use of limited water resources and biodiversity degradation.**
- REDD+ : a mechanism developed by Parties to the United Nations Framework Convention on Climate Change (UNFCCC). It provides financial incentive for developing countries to reduce emissions from forest degradation. REDD+ currently serves as a vehicle for forestry projects financing, but, its definition of a forest does not **exclude monoculture tree plantations**, it only excludes oil palm plantations.

Criteria for meaningful carbon offset



1. Be additional: the project would not have happened without carbon credits that make it profitable. By contrast, if it would have happened without carbon credits, it is not deemed additional.



2. Be based on a realistic baseline: the baseline estimates what emissions would have been without the project (more efficient stoves vs wood stoves, renewable energies vs coal & gas, etc.).



3. Be independently verified: a qualified third-party (CDM, VCS, JI Track 1, Gold Standard etc.) must verify GHG emissions reductions.



4. Address permanence: in the case of bio-sequestration, wildfires could compromise carbon sequestration permanence. The risk needs to be addressed in order to guarantee carbon sequestration.



5. Do no "net harm" : Projects must not create negative externalities (human health, biodiversity, air pollution etc...). It should rather generate co-benefits.

6. Avoid leakages: An offsetting project could create carbon credits while increasing emissions elsewhere. A reforestation project could displace subsistence agriculture away from native communities.



We have identified six criteria determining the quality and integrity of a carbon offset.

Both companies looking to offset their emissions and investors can rely on them to **maximize the potential impact of the offset and minimize the risk of unintended consequences.**

Carbon Capture and Storage technologies

Carbon capture and storage (CCS): includes applications where the CO₂ is captured and permanently stored

Carbon capture, utilization and storage (CCUS): includes CCS, CCU and also where the CO₂ is both used and stored, for example in enhanced oil recovery or in building materials, where the use results in some or all of the CO₂ being permanently stored ([IEA](#), Sept. 2020)

Investments in CCUS are scarce. Most mainstream 2°C compatible scenarios (at least from the IEA) rely on the large-scale adoption of carbon capture and storage technologies (CCUS) but investments are still lagging.

Annual CCUS investment has consistently accounted for less than 0.5% of global investment in clean energy and efficiency technologies. (IEA, Sept. 2020). For a sectorial case study, see our case study on LafargeHolcim.

There is scientific and commercial hesitation vis-à-vis CCS

CCS' only intrinsic value resides in reducing CO₂ emissions to comply with upcoming climate change regulations (CCUS is different as it involves the "use" of the carbon sequestered, but as today, there are little viable "use cases", an example is the injection in concrete, with new method storing CO₂ in it, see carbon curing developed for instance by Aramco). It feels like adding a technology on top of a system that set up the problem (climate change) in the first place. This paradox is called **incremental innovation** in sociotechnical system*. It is opposed to radical innovation: transcending a sociotechnical system to reinvent a new one. **There is therefore an opportunity cost** in building incremental carbon dioxide removal technologies instead of developing other less emissive radical new technologies.

At the current rate of technological progress, carbon capture might be the only cost-effective way for certain industries to decarbonize their production processes in the near term.

Carbon capture can be technologically feasible as several pilot projects demonstrate (see Drax case study) but remains in its infancy. Often, **projects are not economically viable without public support. Further, sequestration is not yet mastered**, going against the hypothesis of a **timely transition**.

The EU Taxonomy Technical Report from the Technical Expert Group assumes that CCS is eligible for green financing if it enables an economic activity in the manufacturing sector to meet its screening criteria (e.g., gCO₂/KWh threshold).

It depends on the activity for which CCS would be implemented. CCS is eligible to green financing if substantial mitigation impacts can be demonstrated by reducing emissions towards meeting the activity criteria: the use of CO₂ for enhanced oil extraction would not qualify. To be eligible to green financing on a coal power plant, CCS would have to demonstrate that the plant could reach zero emissions by 2050. CCS for gas-fired power plants may qualify but is subjected to the requirement that fugitive emissions across the gas supply chain need to be measured rather than estimated.

*Sociotechnical system: refers to interactions between society's complex infrastructures and human behavior.

INTERVIEW

NATURAL CAPITAL FINANCE ROLE IN THE TRANSITION



GAUTIER QUÉRU
Fund Director, Land Degradation
Neutrality Fund Member, Mirova



EDIT KISS
Director of Development and
Portfolio Management,
Althelia Funds

“ *The land use sector is instrumental to the 2°C target and climate emergency. **Nature based solutions represent 50% of the near-term mitigation opportunity (by 2020) and 37% of the longer-term 2030 mitigation opportunity.*** ”

“ *We need to **increase and secure stable demand for sustainable agroforestry with the help of corporates**, that can act as off takers of the sustainable agriproducts from the “responsible value chains” financed by the LDN Fund.* ”

“ *Nature-based solutions are gathering momentum and appear to be at a similar stage as renewable energies were 15 years ago.* ”

“ *The **production of agricultural goods, such as meat, soya (for animal feed), palm oil, corn, is the first driver of tropical deforestation.** Furthermore, a significant share of this agricultural commodity production is intended for exportations. High income countries thereby “import deforestation”.* ”

*On the zero-deforestation commitments I would just say that the issue is still that **all these players making these commitments but do not want to pay a premium for the sustainable attributes and/or for the external externalities like carbon** so it is not helping with the financing gap/business case unless they start looking at it more holistically.*

[The full interview is available here](#)



Lever #5 | Provide decarbonization solutions

Another way brown industries can contribute to climate change mitigation is to **provide products and solutions to reduce the environmental footprint of other industries**. The EU Taxonomy Regulation acknowledges the potential impact and categorizes them as “*enabling activities*”. They can be either long-term or short-term, depending on whether they enable **low-carbon activities** or other activities that are “**transitioning**”. A few examples of green solutions provided by GHG intensive industries are presented in the table below.

“Brown” sectors	Enabling solutions	Enabled sectors
Steel production	Steel is used in the manufacturing of wind turbines for electricity generation, which replaces other more emitting sources of energy such as coal or natural gas. Every part of a wind turbine depends on iron and steel . Components include cast iron, forged steel rotor hub, electrical steel parts, generator, tubular towers etc. <i>For instance, ArcelorMittal identifies wind and solar energy as its market sub-segments and provides solutions for these industries.</i>	Power generation
Oil & gas	Oil & gas companies can develop Sustainable Aviation Fuels (SAFs) produced from renewable feedstock such as waste or biomass . Compared to traditional jet fuel, SAFs helps to reduce lifecycle CO₂ emissions in the aviation industry, where there are few low-carbon alternatives currently. According to BP, SAFs can produce up to 80% fewer emissions than conventional jet fuel over its lifecycle . <i>Neste (covered in a detailed case study later in the section) is an oil refining and marketing company that produces such SAFs.</i>	Aviation
Rubber tire production	According to data from the European Commission , tires account for 20-30% of the total energy for a moving vehicle due to their rolling resistance . By producing more fuel-efficient tires, tire manufacturers can help cars reduce their rolling resistance, use less fuel and emit less over the lifetime of the tire. <i>Many tire manufactures like Bridgestone, Michelin and Nokian Tires are developing tires with lower rolling resistance as a lever in their sustainability strategies.</i>	Transportation
Construction	The design and materials used in building construction and renovation affect the energy efficiency of the building over its in-use lifetime . During the buildings’ operational phase, space heating and cooling, water heating and lighting consume energy , and hence contribute to GHG emissions reduction. Materials that increase the thermal insulation of buildings such as foam glass, PU and XPS decrease the need for space heating. The use of more efficient space and water heating equipment (e.g., heat pumps) also contributes to energy efficiency of buildings.	Buildings & Real Estate (operational phase)



Greening by solutions

One difference between the “greening of” and “greening by” levers is the way GHG emissions can be analyzed. **For companies providing solutions for other industries, it goes beyond Scope 1, 2 and 3 GHG emissions reduction of their own activities.** It also includes the measure of “**avoided emissions**”. Avoided emissions are measured compared to a less favorable reference case. The World Resource Institute released a [working paper](#) about avoided emissions, providing a framework for estimating and disclosing GHG emissions impact of a product relative to the situation where that product does not exist.

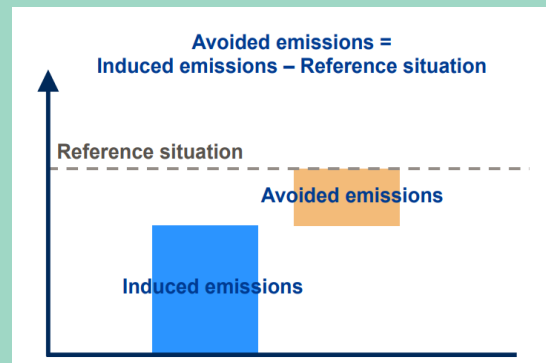
Companies engaging in the “greening by” lever often report the **emissions avoided**, or the **emissions reduction** of their customers.

There can be **potential shortcomings to analyzing these emissions**:

- **There are no international standards to account for and report avoided emissions.** Industries or companies had to develop their own approach. Depending on the reference situation chosen, there is a risk of an **overestimation** of the expected GHG emissions of the reference situation, resulting in an **overestimation of avoided emissions**.
- **We should not forget the absolute GHG emissions induced**, which continually deplete the carbon budget. The Science Based Targets Initiative (SBTi) view avoided emissions to fall under a **separate accounting system** and do not take them into account when reviewing science-based targets of companies.

When assessing a company, it is necessary to adopt a **holistic view and try to consider all the impacts of its business**. Transitioning is not blindly using one sole lever; often several levers can be activated **simultaneously** to achieve maximum GHG emissions reduction. On top of avoiding emissions by providing solutions, more can be achieved if it also decarbonizes its own activities.

Conversely, if the reference situation can be avoided entirely by quitting a certain activity, then option to quit/exit should be thoroughly examined.

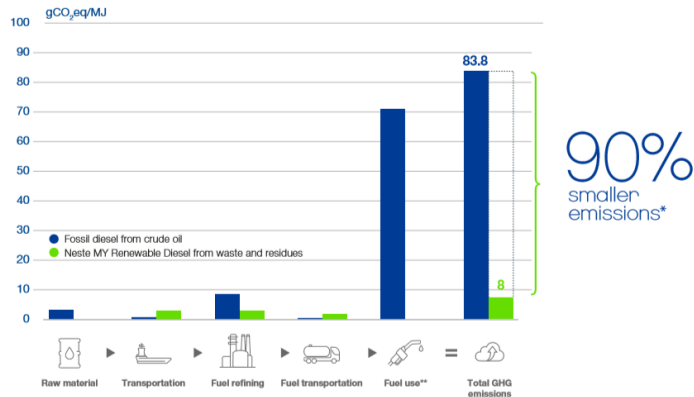


Neste: a provider of decarbonization solutions

Neste is a downstream oil company but is also a major producer of biofuels (the world's largest producer of renewable diesel). It has developed a lower-carbon solutions portfolio for road transport, aviation, bio-based plastics & polymers (for a more sustainable petrochemical industry).

How & why the lever examined has been actioned by Neste?

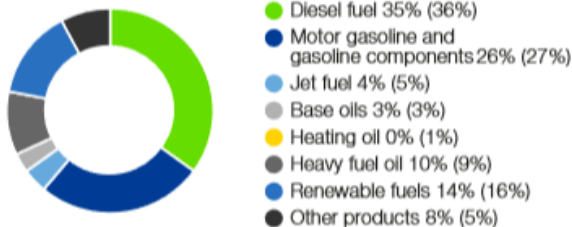
- Development of a technology based on the hydrogen treatment of **vegetable oils (HVO) and waste animal fat to create renewable diesel** called “NEXBTL”. As a byproduct, the technology can also be used to create **renewable gasoline and bio propane**.
- Creation of “MY Renewable Diesel”, a biodiesel produced from renewable raw materials (waste fats, residues and vegetable oils), delivering a **90% reduction in total GHG emissions** compared with fossil fuel-based diesel (see charts). It can be used in the chemical industry as a raw material for renewable plastics or solvent in paints.



Governance, timeline, investments around its lever mobilization

- **Government shareholding** : the Republic of Finland holds 35.96% of Neste's total share capital (as of 31 July 2019). No other shareholder holds more than 10% of shares.
- **Commitment to sustainable palm oil as raw material in anticipation of criticisms** relating to biofuels (100% certified, through the Indonesian Sustainable Palm Oil, ISPO; the International Sustainability & Carbon Certification, ISCC; & Roundtable on Sustainable Palm Oil, RSPO).
- **Unintended and detrimental consequences as it stresses demand on palm oil** and spurs competition for land use. Palm oil accounted for 17% of renewable raw material usage in 2018.
- **A 69% GHG reduction on average due to palm oil** when refined into Neste MY Renewable Diesel. In January 2019, Neste's deforestation risk management performance was evaluated within CDP Forests program as belonging to the leading performers' Leadership-class.
- EU compliant International Sustainability and Carbon Certification (ISCC) compliance of Neste's renewable products refineries.

Sales by product from in-house production, %



Source: Neste reports

Overall impact of this lever on the transition of the company and next steps

- Slightly modified from Neste MY Renewable Diesel (blended with fossil for sector's requirements), Neste MY Renewable Jet Fuel™ provides the aviation industry with biofuel, helping to decarbonize the industry. Even though 17% of its biofuel was generated from palm oil in 2018, the company generated 83% of its biofuels using waste as its raw material.
- Neste helps its customers to reduce their GHG emissions by providing renewable fuel (7.9 Mt CO₂e avoided in 2018). However, renewable fuel only accounts for around 14-16% of sales in 2018, conventional refining activities representing the rest.
- In January 2019, Neste reached the leading performers' "A List" in the CDP Climate Change assessment. Only 126 companies globally were awarded with the 'A List' placement, Neste being the only energy company to disclose its forest footprint as part of the CDP Forests program

Circularity

- Use of waste plastic as a raw material for fuels, chemicals and new plastics
- A target of more than 1 Mt of liquefied waste plastics annually from 2030 onwards as a raw material for its fossil refinery to reduce crude oil dependence (for illustration, 1Mt represents nearly 4% of the discarded plastic waste currently generated in Europe)

Emissions reduction

- A target of an annual **14 Mt CO₂e reduction by 2023** & an annual **20Mt CO₂e avoidance of scope 3 emissions** by 2030 (vs.7.9 Mt CO₂e in 2018). However, it does not disclose any target for other business lines (diesel fuel, motor gasoline,...)
- Neste communicates in terms of avoided emissions (against a counterfactual/baseline, which is "traditional products used by customers), and not reduced emissions. Regrettably, the company does not have a public target on carbon intensity reduction per MJ delivered. Greater clarity between reduced and avoided emissions would be a plus in the company's communication.
- Employees or executive's remuneration incentives to achieve climate related targets
- Neste discloses energy efficiency targets and aims at reducing energy consumption by **500 GWh** during 2017-2025 (for comparison, 2017 consumption: 12.3TWh, such reduction is meant to be achieved through existing facilities improvement such as wastewater treatment plants at Porvoo and Rotterdam Refineries and the commissioning of the new combined heat and power plant scheduled for commissioning in 2019 in Porvoo). No information is provided on alignment strategy and scenario analysis.

EXIT

In July 2019, Neste signed an agreement to sell its fuel retail business of 75 fuel stations in Russia to focus on its strategic priority: “Neste MY Renewable Diesel”.

DIVERSIFY

Neste does not diversify as it sticks to its core-business and decarbonizes it through input/feedstock diversification.

DECARBONIZE CORE ACTIVITIES

It decarbonizes the final-use of products with renewable diesel developments. It is also switching part of its electricity supply to wind power at its Rotterdam refinery (no numbers available).

OFFSET

Not mentioned by the company

PROVIDE DECARBONIZATION SOLUTIONS

The patented technology (NEXTBTL) helps to develop fuels from waste, residues & hydrogenated vegetable oil. The products which mimic conventional fuels chemical structure helps the decarbonization of the transportation sector.

In a nutshell

- **Is it ambitious?** Neste intends on growing its renewable fuel production capacity and reach a 20Mt CO₂e annual scope 3 emissions reduction by 2030. This is ambitious but Neste does not disclose any information regarding its conventional fuel refining activity.
- **Is it consistent?** Neste’s transition strategy is overall consistent, as it is strategically orienting its activity towards renewable diesel generation from waste and residues. However, the bulk of its activities is still highly emitting. It is concerning that the company does not address any decarbonization targets regarding its conventional refining activities.
- **Is it game changing?** By introducing a mix of technologies (Neste MY Renewable Isoalkane, Neste MY Renewable Propane, i.e. 100% bio-LPG) and providing renewable fuels at an industrial scale, the company contributes to the refining industry transformation. To offer fuels with similar features is clearly a strong transition driver. It introduces a substitute to conventional diesel.
- **Is it enough?** Not for the moment, highly emissive activities of the company are not addressed with the same importance as renewable fuels although the latter represent 14% of its sales, it is not sufficient to say that the company is really transitioning on the short run. Indeed 86% of its activity remains highly emissive.

3.3 | A FOCUS ON THE AMBIVALENT ROLE OF GAS

Sensing gas' potential contribution to climate change mitigation

Two main benefits of gas-fired plants amid transitioning energy systems

1

Versatility & flexibility : combined cycle gas turbine (CCGTs) can play various roles. **CCGTs can be run for baseload and/or peak load purposes**, depending on either immediate grid constraints or the structure of the given country's or region's power generation mix.

In the absence of large-scale, commercially viable electricity storage solutions, **CCGTs' balancing role has been made even more pivotal since the development of renewable energies which are intermittent by nature.**

2

Substitution for more CO₂ intensive fossil fuels in the power sector amid transitioning energy systems. In the recent trends of the European power sector, one finds two specific types of coal-to-gas switches triggered by the implementation of climate change-centric environmental policies:

- Carbon price-driven coal-to-gas switch (UK, Germany) following price developments at the Emissions Trading Scheme level
- Coal supply-driven coal-to-gas switch (Spain in 2019)

In Western Europe (France, Germany, Italy, Spain, United Kingdom), gas-fired plants can be seen as key enablers of the freshly-launched national coal phase out policies.

Natural gas substituting for more carbon-intensive fossil fuels in power generation mixes is not by nature a distinctive feature of the energy transition.

The "shale revolution" in the US in the early 2000s is an ambiguous case:

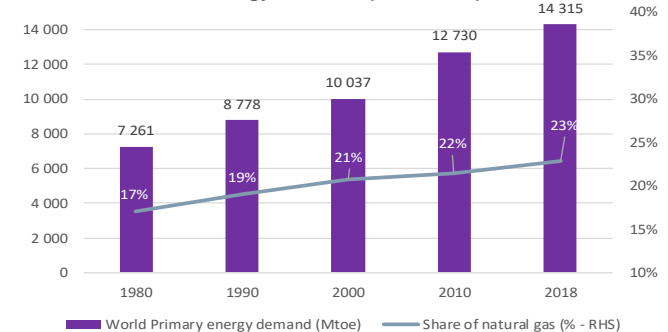
- It triggered a massive coal-to-gas switch in the electricity sector over the past 10 years...
- ...in a still highly hydrocarbon-dependent economy, with no overarching plan to transition towards a zero-carbon energy system and dependence on hydrocarbon exports.

In the case of Saudi Arabia, the increased role of natural gas in the domestic energy system can even be seen as having optimized oil rentierism.

The share of CCGTs growing to 58% in 2018 (from 50% in the early 2000s) at the expense of oil...

- ...can be seen as having allowed a more efficient use of hydrocarbons resources in the perspective of increased oil exports as well as a growing plastics & petrochemical sector.

FIGURE | Share of gas (%) in world primary energy demand (1980-2018)



Source: IEA (WEO 2019)

Emerging forms of gas can make existing gas infrastructures compatible with a low-carbon economy

Biomethane and “green” hydrogen offer new avenues to accelerate the world economy’s decarbonization

“Green hydrogen” is produced by zero-carbon electricity-powered electrolysis & aims at:

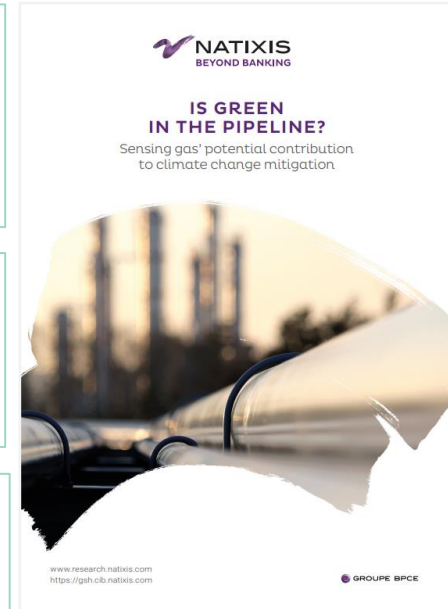
- **Taking advantage of the chemical properties of hydrogen (zero CO₂ emission upon combustion) to extend its use** to sectors / activities based on the combustion of fossil fuels, in particular hard-to-abate sectors such as long-haul mobility;
- **Decarbonizing the production of hydrogen** (Scope 1 & scope 2 emissions) **to reduce the overall carbon footprint of sectors / activities using it as feedstock.**

Biomethane is a near pure form of natural gas & brings indirect climate benefits (production associated with removal of GHGs). **The molecule can be safely injected into existing gas infrastructures:**

- Its development does not involve any **retrofitting/repurposing of existing gas infrastructures**
- Existing networks & storage sites can safely play a direct role in the progressive substitution of this molecule for natural gas

Green hydrogen, and to a lesser extent biomethane, are both plagued by high production costs relative to natural gas due to:

- Current **lack of economies of scale** for both molecules
- For green hydrogen, high CAPEX (electrolyzer and high storage cost) & OPEX (electricity)



See our full report “What role for natural gas in the transition towards a low-carbon economy?”

Biomethane and “green hydrogen” offer new avenues to accelerate the economy’s decarbonization

CHART | Four theoretical benefits of green hydrogen

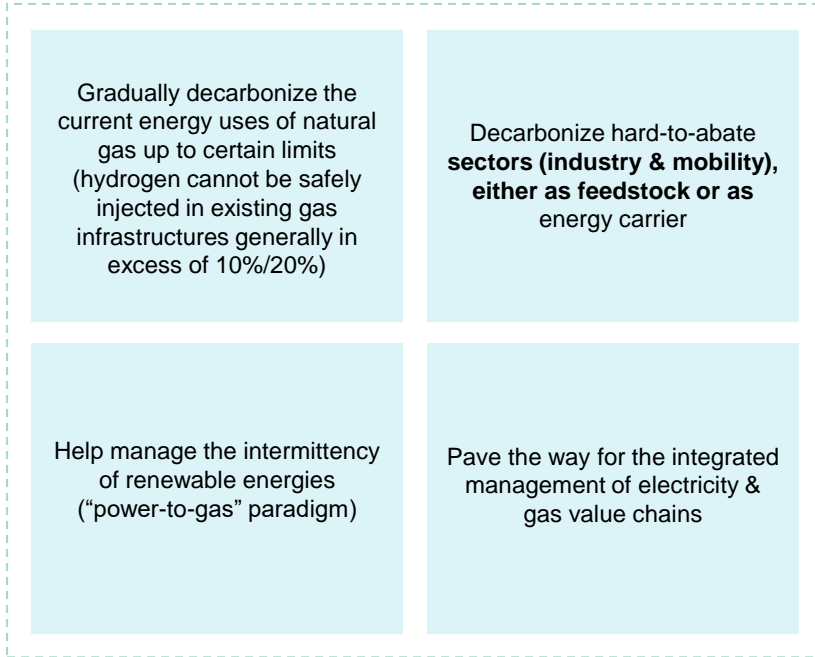
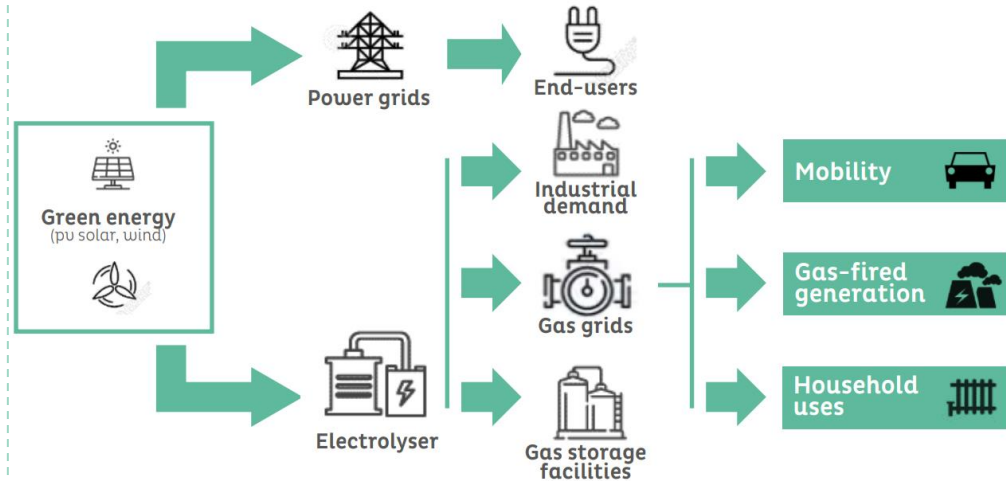


CHART | Simplified overview of the potential green hydrogen value chain



See our full report “What role for natural gas in the transition towards a low-carbon economy?”



Through the integration of low-carbon gases, existing gas infrastructures can actively tackle the asset stranding risk

At this stage, due to technical & economic reasons, "domestic" gas infrastructures seem most able to respond to some challenges raised by the development of biomethane and green hydrogen.

Gas networks are capable of transporting energy over long distances at very low cost, hereby offering the best solution to gas transport from a techno-economic perspective

They can transport & deliver very large quantities of energy. Their current sizing does not constitute an obstacle to any rapid growth in low-carbon gas blending

Gas networks have intrinsic flexibility thanks to the use of pressure adjustment, offering at this stage, the possibility of safely injecting quantities of low-carbon gas at any time

In almost any developed country making use of natural gas for residential heating purposes, **existing gas networks have been developed in the perspective of an exhaustive yet tight coverage of the entire territory**, enabling a broad & homogeneous decarbonization of the end uses of natural gas

Early involvement in the emergence of biomethane & green hydrogen offers gas infrastructure operators/owners an **almost free option** for the time being to manage disruptive technology changes:

Adaptation CAPEX required for injecting biomethane and, for the time being, hydrogen into existing infrastructure are almost zero.

With regard to hydrogen, adaptation CAPEX should remain very limited for **at least 10 years**.

The technical elements above also suggest that the **developments of biomethane & hydrogen can be jointly managed** and therefore **without potential conflicts** between the two molecules at least in the next 10 years.

Through involvement in projects around biomethane & green hydrogen, **gas infrastructures can participate in the development of responses to certain technical limitations raised by the electrify-everything approach**, particularly in the mobility sector.



Sensing the “transitional” nature of gas assets/ downstream uses

The discussion on the role of natural gas in the energy transition calls for nuanced conclusions

1

In the absence of a systematization of the use of carbon capture and sequestration (CCS), **the use of the molecule for energy purposes will not make it possible to achieve carbon neutrality by 2050.**

2

On the other hand, **gas offers a key lever for exiting coal, alone or in addition to renewable energies.**

3

Better still, the use of existing midstream gas infrastructure for the development of low-carbon gases can create a continuum until a low-carbon economy is achieved.

By playing this role, these infrastructures can promote the emergence of disruptive technologies while limiting the stranded costs for the owners of the infrastructures & the final cost of electricity borne by the consumer.



Overall, the EU taxonomy sees a limited role of the current uses of natural gas for electricity generation and heating in a low-carbon economy, unless CCS is massively deployed. However, it highlights the potential role of low-carbon gases as far-reaching decarbonization agents.

As a result, **the EU Taxonomy draws an implicit distinction between the molecule itself** (with direct and/or indirect carbon footprint from extraction to final use) **and the various associated infrastructure assets forming the sectoral value chain** (gas pipelines, storage cavities, LNG trains). The underlying stance is that in some specific instances, these infrastructure assets can enjoy potential use and preserved economic value in a low-carbon economy.

By 2030, natural gas has a **key role to play in exiting coal and oil in electricity generation**, mainly in geographical areas (Europe, North America, Japan and, to a lesser extent, China and India) where the existing asset base is sufficiently diversified to allow trade-offs between fuels (i.e., using existing natural gas assets to displace coal and oil assets whenever possible).

Past this horizon, **assuming that CCS has still not shown any sign of attaining commercial maturity by 2025**, developing the existing asset base in its current configuration (Upstream, Midstream, CCGTs) **would have no environmental justification**, and would in fact perpetuate the carbon lock-in of economic systems.

In parallel, and probably until 2040-2050, gas infrastructures would play a crucial role in helping the biomethane & green hydrogen industries attain maturity, without prejudging to begin with, which of these would impose itself as the decarbonization agent of choice.



04.

TRANSITION FINANCE TOOLKIT



KEY TAKEAWAYS Chapter 4

Green Finance is now a core component of Climate Action and benefits from a strong impetus and legislative plans from policy-makers. The global Green/Sustainable/Social debt market reached \$1.192 trillion threshold as of December 2020.

Brown industries are still largely absent from the Green Bond market, which still focuses on green activities and players

- Investors are relatively less confident in predominantly and/or historically brown companies as they assess company's profile & strategy in addition to the Use-of-Proceeds.
- There is a lack of standards for activities in "grey areas" (whose "greenness" depends on observed performances like efficiency gains).

The EU Taxonomy tries to address the lack of standards for activities in grey areas

- Stringent thresholds can be fairly understood from the climate neutrality objective but could lead to a niche of eligible companies or assets.
- The level of stringency, combined with its binary nature (i.e., without shades) makes the acceleration of brown industries' transition difficult.

There is increasing investors' appetite for transition KPI-linked products that could include brown industries

The General Corporate Purpose model tied to a key performance indicator on which different financial mechanism could be built allows a more holistic and forward-looking approach of climate finance. UoP & General Corporate Purpose should not be opposed and can be complementary.

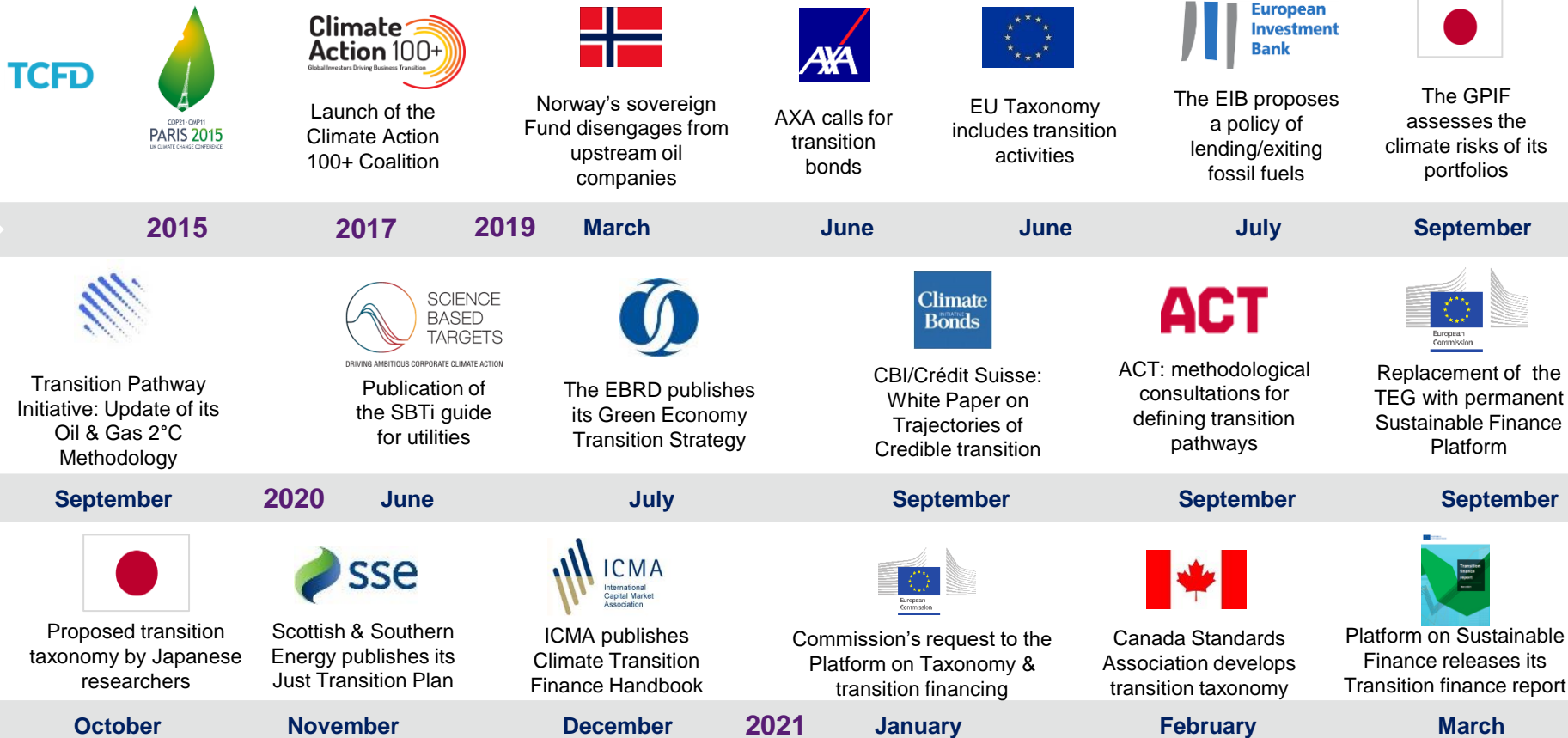
There is a new standard around Sustainability-Linked Bonds

The ICMA has launched guidelines on the disclosures that should be made by issuers when raising funds in debt capital markets (the "**Climate Transition Finance Handbook**").

Investors have willingness / appetite to invest in brown companies' transition, but without leniency and are open to new instruments (KPI-linked instrument), as shown in our Investors survey.

Source: Green & Sustainable Hub, Natixis

Strong momentum for transition finance



Self-labelled transition bond issuances

青山發電有限公司
Castle Peak Power Co. Ltd.

Castle Peak Power Energy Transition Bond
\$ 350M 10Y Energy Transition Senior
Unsecured Bond

Issue Date

25 July 2017
22 June 2020



SNAM Transition Bond
€ 500M 10Y Transition Senior Unsecured Bond

Issue Date

17 June 2020



EBRD Green Transition Bond
€ 625M 5Y Green Transition
Senior Unsecured Bond

Issue Date

17 October 2019



GRUPE
BPCE

BPCE Transition Bond
€ 100M 10Y Transition Senior Non-Preferred
Bond

Issue Date

9 December 2020



Marfrig Sustainable Transition Bond
€ 500M 10Y Sustainable Transition
Senior Unsecured Bond

Issue Date

6 August 2019



Your Gas Network

Cadent Transition Bond
€ 500M 12Y Transition
Senior Unsecured Bond

Issue Date

11 March 2020



中國銀行
BANK OF CHINA

Bank of China ICMA Handbook-Linked Dual
Tranche Transition Bond
\$ 500M 3Y Transition Senior Unsecured Bond
¥ 1.8B 2Y Transition Senior Unsecured Bond

Issue Date

7 January 2021

4.1 | THE EU TAXONOMY OF SUSTAINABLE ACTIVITIES

A decisive boost in reshaping mainstream finance & exiting the sustainable finance niche

A “**science-based dictionary**” defining what is unambiguously green setting disclosure requirements for **various actors** covering a **broad scope of activities** with 90 activities assessed for climate change mitigation, and 98 for adaptation (Draft Delegated Acts, Nov. 2020).

COVERAGE

- **Welcome coverage of high emitting sectors but criteria’s stringency** makes it only practicable for forerunner “brown companies”
- Need for an **intermediary level of green & a definition of criteria defining brown or “harm”**

USE & PURPOSE

- **Numerous uses** (*design of sustainable products, funds, financing programs or supervisors and central banks interventions*)
- **Purposes beyond financing or investing activities** (*public procurement requirements, industrial policies, etc.*)

CRITERIA

- **Demanding data collection** for activities’ conformity assessment
- Companies’ processes and information systems **reshuffle** needed to feed the metrics and produce compliance data/KPIs

FURTHER DEVELOPMENT

- Adaptation & mitigation criteria will be extended, **adjusted** and **refined** regularly.
- Criteria for contribution to other environmental objectives are to be **developed** by the future Sustainable Finance Platform

An evolving scheme with **interim periods** during which some actors – verifiers, auditing firms, banks – will play a key jurisprudential role until full completion of technical screening criteria.



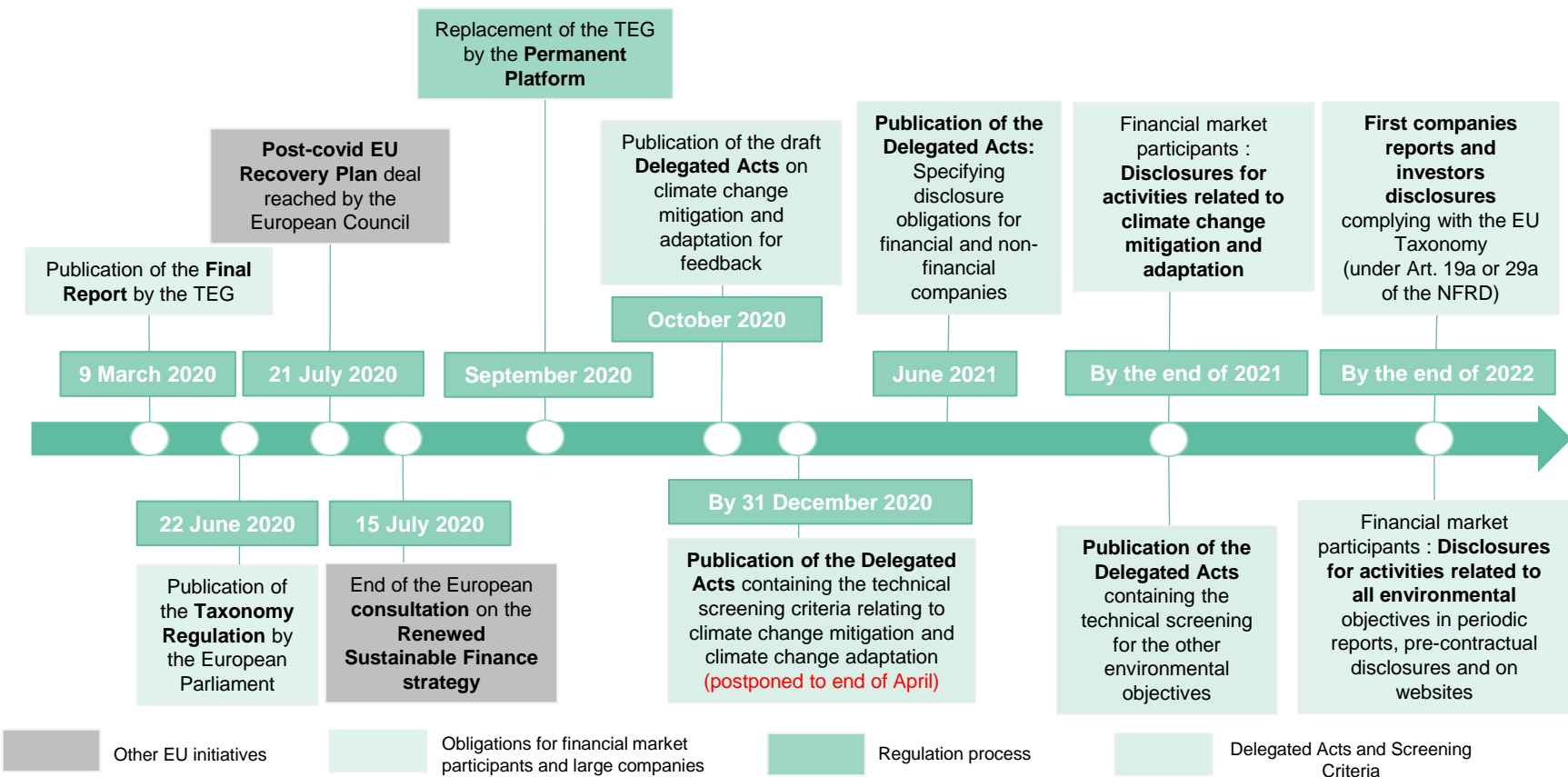
Entry into force in a very short lapse of time
First set of Taxonomy disclosures required by the end of 2021

- We invite actors **to seize the opportunities offered by the Taxonomy** and not to see it as a burdensome additional transparency requirement.
- A strategic use of the Taxonomy is possible for companies aiming at making their business models resilient to a carbon-constraint economy. Taxonomy KPI dashboards on revenues, CAPEX and R&D can be a compass in their transition journeys.
- In return, the policy-makers must closely monitor the (unintended) effects of the Taxonomy Regulation, be able to adjust, and feed their decisions with active feedback from market participants. Until now, transparency and dialogue have been remarkable.

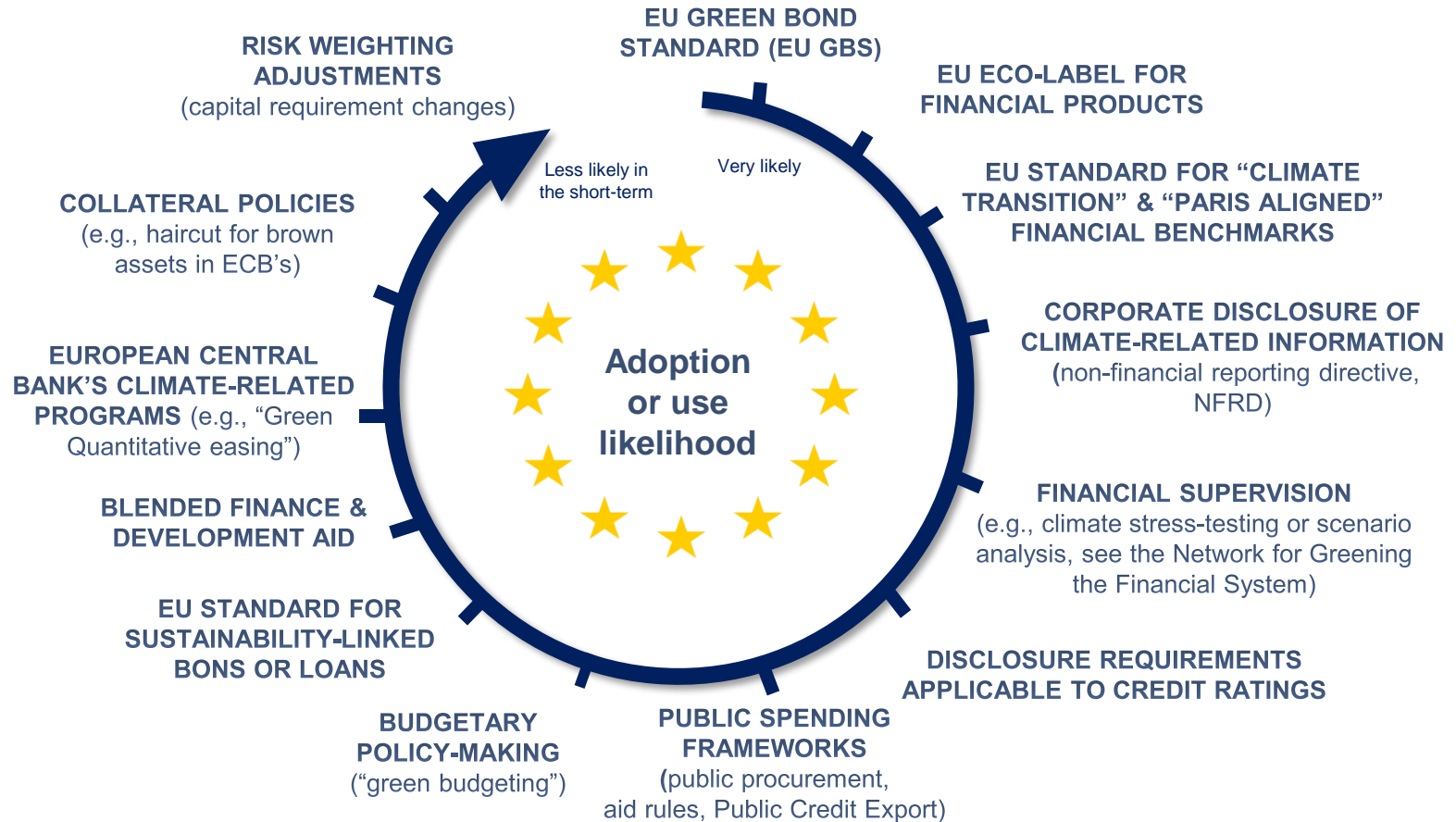


[Click here to see our dedicated report](#)

The EU Taxonomy Timeline: legislative process and entry into force



Overview of the potential and various uses of the Taxonomy



EU Sustainable Finance Platform's views on “transition finance”

The Taxonomy **entered into force in July 2020** and sets out different means by which economic activities can substantially contribute to that objective.

With regard to the objective of climate change mitigation, the Regulation explicitly defines “**transitional activities**” as those making a substantial contribution to environmental objectives within sectors where low-carbon alternatives are not yet available and thus caters in some respects for the need to support the transition. Transitional activities are considered sustainable to the extent that they meet clear requirements and support the transition to climate neutrality in line with EU climate objectives.

By June 1st, 2021, the Commission will adopt delegated acts setting out the content, presentation, and methodologies for complying with the disclosure requirements under Article 8 of the Taxonomy Regulation.

The Aim of the EU Platform on Sustainable Finance

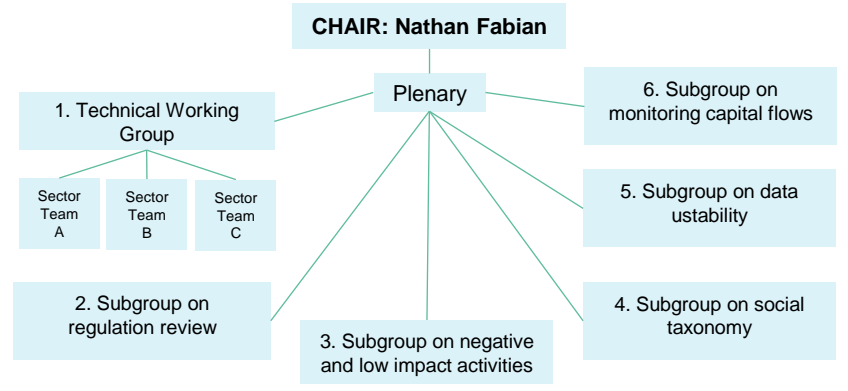
The platform is an **advisory body** subject to the Commission's **horizontal rules for expert groups**. Its main purpose is to **advise the European Commission on several tasks and topics related to further developing the EU Taxonomy** and support the Commission in the technical preparation of delegated acts, in order to implement the EU taxonomy.

Based on the mandate of the Platform in Article 20 Taxonomy Regulation, the members and observers started work on **four main tasks** to deliver key deliverables:

1. Advising the Commission on the **technical screening criteria** for the EU Taxonomy, including on the usability of the criteria
2. Advising the Commission on the review of the Taxonomy Regulation and on covering other sustainability objectives, **including social objectives and activities that significantly harm the environment**
3. **Monitoring and reporting** on capital flows towards sustainable investments
4. Advising the Commission on **sustainable finance policy** more broadly

The Platform's Organization

The Platform has, in principle, an unlimited duration, taking into account the different tasks provided for in the Taxonomy Regulation and the need to amend the technical screening criteria of the EU taxonomy over time, in order to reflect, for instance, changing EU environmental legislation or technological developments.



EU Sustainable Finance Platform's views on transition finance

The Request & Need for Advisory

In accordance with Article 20 of the Taxonomy Regulation, a platform is mandated to advise the European Commission in the evaluation and development of sustainable finance policies.

As part of their deliverables, the subgroups on negative and low-impact activities and on data and usability are each considering the applicability and use of the taxonomy to guide and incentivize the transition to a sustainable economy from different angles.

The expertise and preliminary findings of the Platform would therefore provide valuable input at this stage and could feed into the Commission's work on finalizing the delegated act on climate change objectives, the future Article 8 delegated act and the Renewed Sustainable Finance Strategy.

The Commission asked the platform on Sustainable Finance to provide advice on the existing and potential use of the EU taxonomy framework for enabling the financing of the transition towards a sustainable economy.

Given the fact that this matter is highly time sensitive, the request entails that the Platform provides its advice by mid-March 2021.

Members and observers in the platform

50 members selected from more than 500 applications

E.g.

- BNP Paribas
- Bloomberg
- Airbus
- Allianz
- ICMA
- Climate Bonds Initiative
- Global Reporting Initiative

7 members of public entities appointed through Article 20

- EEA
- EIB
- EIF
- EBA
- EIOPA
- ESMA
- FRA

10 invited observers

- EBRD
- ECB
- EFRAG
- EPA
- ESM
- NGFS
- OECD
- UNEP FI
- Cdp SpA

The Required Scope of Advice

The Platform was asked to provide answers to the following questions:

- Can the current EU taxonomy framework be used to provide **greater support for attracting capital for the transition of companies towards “sustainable” activities**, including in ways not yet proposed by the Commission and if so in which ways?
- Can the EU taxonomy framework **support finance for companies undertaking activities that do not yet meet**, or may be unable to meet, the substantial contribution criteria? And how can this be done?
- Can the current EU Taxonomy framework support **finance for companies active in sectors that are not covered in the Taxonomy Regulation's Delegated Act**?
- How does the use of key **terminology such as “sustainable”, “green” and “harmful” compare across the taxonomy framework** and other relevant sustainable finance frameworks and how can it be clarified and harmonized?
- What **further avenues** could be explored to enable financing the transition through **development of the taxonomy framework** and beyond?
- Can we clearly address the **concerns that the taxonomy will be used to prevent financing of transitional activities**, while at the same time ensuring that we are **not facilitating “green-washing”**?

The EU Sustainable Finance Platform's views on transition finance

Takeaways from the March 2021 report

Recommendations are divided into three groups:

1. Use other policies and tools | 2. Maximize the current Taxonomy | 3. Develop the future Taxonomy

Reminders:

- The Taxonomy in its current form describes which activities are green, without specifying those that are at risk of causing significant harm. It focuses on individual economic activities and is, therefore, more granular than "transition".
- Taxonomy-reporting is mandatory for financial products that claim to either have an environmental objective or environmentally beneficial characteristics. The Taxonomy is useful for targeting, tracking and communicating progress.
- The EU Taxonomy contains criteria pertaining to specific activities carried out by companies. It is, therefore, not a classification of companies as such nor of their overall transition pathways.



[Click here to access the report](#)



Key proposals

- **Entity-level disclosure:** companies are encouraged to disclose their transition strategies and specify the role of the EU Taxonomy therein. Voluntary, forward-looking disclosures relating to taxonomy alignment can help to provide that longer-term vision.
- **Launch of a feedback loop:** stakeholders are given the opportunity to provide suggestions to the Platform on **what activities should be considered next** for inclusion in the Taxonomy and **whether criteria for existing activities should be revised**
- **Developing additional categories / criteria for activities with “no significant impact”** (little or no impact) and **“causing significant harm”** (identifying activities & performance levels that companies and financiers must move away from)
- **Going downstream in value chains:** currently, the technical screening criteria relate to either the final product (e.g., vehicles produced) or the production process (metals, cement) but it could include the downstream activities of the value chain (recognizing the contribution of the entire supply chain around taxonomy-aligned activities by financing, distributing, and selling of taxonomy-aligned products or services, or by providing critical materials to taxonomy-aligned activities)
- **Include activities that enable companies to stop performing significantly harmful activities** (through for instance decommissioning or closure)
- **Interim period & significant harm:** introduction of a phase-out trajectory from “Significant Harm” (SH) to progress towards the alignment with a “Substantial Contribution” (SC) over transition timeframes. Possibility to support significant improvements in performance of activities towards (but not reaching) the substantial contribution criteria)
- **Forward-looking activity-specific investment plan:** recognize activities that are part of an activity-specific investment plan to meet the Taxonomy criteria, through CapEx, OpEx and related finance (allowing companies to consider their investments as taxonomy-aligned)
- **Sustainability-linked Bonds:** the Taxonomy will also be attached to entity-level forward looking and holistic financial instruments, offering a comprehensive picture of companies' carbon neutrality strategies (taxonomy-related KPIs & SPTs).

INTERVIEW

BROWN INDUSTRIES' ROLE IN THE SUSTAINABLE FINANCE LANDSCAPE



CHRISTA CLAPP
Research Director, Cicero

°CICERO
Climate Finance

- “ If sustainable finance is limited to pure play green actors, we are not encouraging an economy-wide transition that is necessary to achieve the climate targets set out in the Paris Agreement. Traditional brown industries need to also be encouraged to play a role in the transition to low carbon, by making efficiency improvements and fuel-shifts that avoid locking-in fossil-based infrastructure. ”**
- “ Trillions of dollars are needed for infrastructure investments in the next decade, and if we ensure low-carbon climate resilient infrastructure decisions, we could save in damage costs from climate-related disasters. We need financing for all Shades of Green to solve the climate challenge. ”**
- “ Green bonds from oil companies are the most obvious controversial example. Key concerns include if the company is really planning a transition to a low-carbon future, and how they will avoid locking-in fossil fuel dependency. ”**
- “ Strong corporate governance is necessary to ensure that project selection and management are aligned with their ambitions for a green transition. Climate targets and procedures to support the achievement of those objectives within a corporation are important, in addition to environmental expertise and criteria being included in project selection and evaluation. ”**

The full interview is available here



INTERVIEW

BROWN INDUSTRIES' ROLE IN THE SUSTAINABLE FINANCE LANDSCAPE



CHRISTA CLAPP
Research Director, Cicero

°CICERO
Climate Finance

CICERO Shades of Green

Examples



Dark green is allocated to projects and solutions that correspond to the long-term vision of a low carbon and climate resilient future. Fossil-fueled technologies that lock in long-term emissions do not qualify for financing. Ideally, exposure to transitional and physical climate risk is considered or mitigated.



Wind energy projects with a strong governance structure that integrates environmental concerns



Medium green is allocated to projects and solutions that represent steps towards the long-term vision, but are not quite there yet. Fossil-fueled technologies that lock in long-term emissions do not qualify for financing. Physical and transition climate risks might be considered.



Bridging technologies such as plug-in hybrid buses



Light green is allocated to projects and solutions that are climate friendly but do not represent or contribute to the long-term vision. These represent necessary and potentially significant short-term GHG emission reductions, but need to be managed to avoid extension of equipment lifetime that can lock-in fossil fuel elements. Projects may be exposed to the physical and transitional climate risk without appropriate strategies in place to protect them.



Efficiency investments for fossil fuel technologies where clean alternatives are not available



Brown is allocated to projects and solutions that are in opposition to the long-term vision of a low carbon and climate resilient future.



New infrastructure for coal

Source: Cicero (2019)

The full interview is available here



INTERVIEW

“BROWN INDUSTRIES” ROLE IN THE SUSTAINABLE FINANCE LANDSCAPE



MANUEL ADAMINI
Head of Investor Engagement,
Climate Bonds Initiative



*The green bond market has grown from zero to around \$750 billion outstanding in about a decade. This is a global phenomenon. But it doesn't change the equation yet. [...] We face a climate finance gap of around \$2.5trillion per year, add SDG goals with their critical contribution to climate resilience, then we're looking at \$5-7trillion. **Achieving the milestone of \$1 trillion in annual green investment early in the 2020s will help change global perception of these numbers from headline style goals to achievable, investment reality.***

*While per-sector contributions can vary significantly across countries and regions and are sensitive to sector boundary definitions, the big five tend to be: energy, buildings, transport, energy-intensive manufacturing and materials, and agriculture/land-use (change). [...] **We need to activate [...] segments of the market that have remained absent [from the Green Bonds market] but offer huge emissions reductions potential as well as nice yield. [...] we're talking cement and concrete, metals and mining, and private transport.** This doesn't sound particularly green – yet we can't achieve our green targets without reductions in these sectors, and that's exactly the point.*

*We can spend every dollar only once. **We have to carefully set gatekeepers and markers when admitting brownish sectors to the green game.** [...] I want to see issuers committed to strategic change: green intentions turning into tangible and verifiably climate-relevant measures.*

***To the extent that KPI-linked products help the market better price [climate] risk, it is surely worth the try.** This market is young and still learning, and all innovation hence welcome.*

The full interview is available here



4.2 | OUR INVESTOR SURVEY ON TRANSITION

Brown industries' transition: a conditional appetite

In a nutshell



75 individual responses collected in 2019

(investors companies totaling ~\$9trn AuM)

Vivid willingness to invest in brown companies' transition among surveyed investors but **without leniency**.

As long as it is not properly defined with criteria, thresholds, or reference to scenario, **43%** are not in favor of transition bonds or loans.

Investors are open to new instruments (e.g., KPI-linked instruments).

Although it is a very nascent market, provided that **trust** is established regarding KPIs selection and calibration.

56% believe such instruments could be a driver of change and are willing to invest in it.

"Top picks" for transition products

Decarbonization of energy supply

Changes in business models towards circularity

Expenditures in breakthrough technologies

High expectations in terms of disclosure and credibility of the transition pathways.

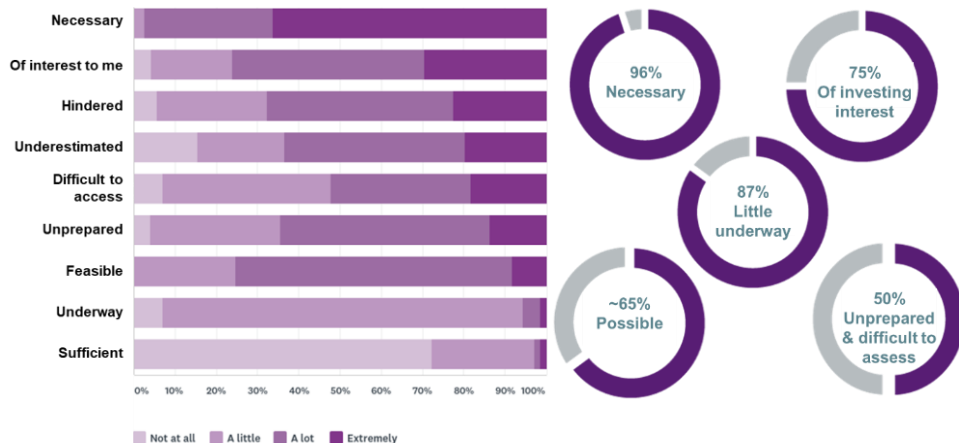
Ability to assess their ambition level against standards such as the EU Taxonomy or the Science-based Target Initiative will unarguably be a plus.

The full survey is available here



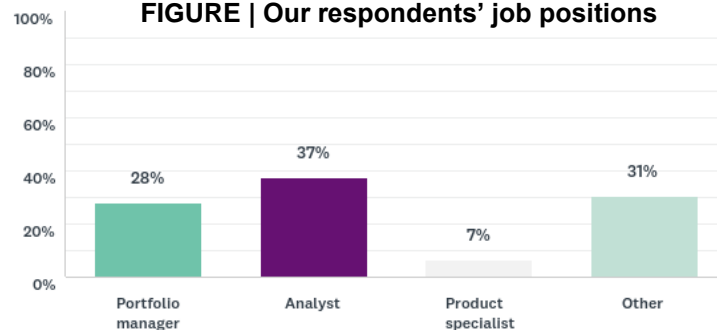
Brown Industries' transition in investors' view

How would you qualify brown industries' transition?



This survey was held online between March 2019 and Nov. 2019. We collected **75 individual answers** from people working in investment companies totaling **~\$9trn of assets under management**.

FIGURE | Our respondents' job positions



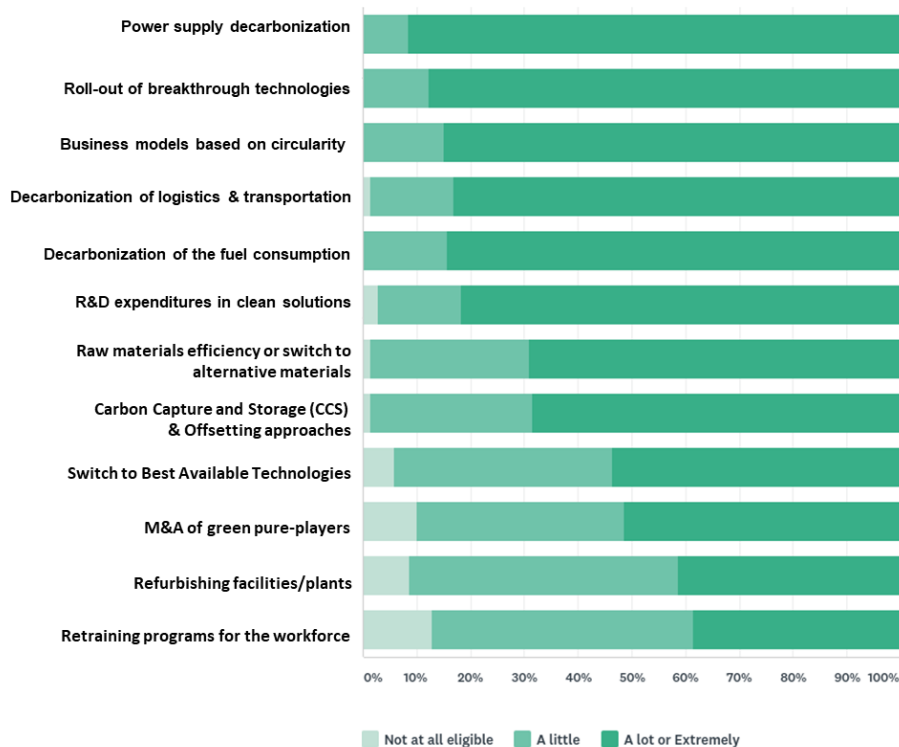
Sample of investors that have accepted to disclose their participation to our survey



Investors' preferred project categories



FIGURE | What technologies or expenditures would you consider as eligible proceeds for a green financing?



TOP PICKS

- Decarbonization of the power supply (renewable energy PPAs, i.e., OPEX, or direct investment in clean power supply)
- Roll-out of transformative technologies (45% consider it as “a lot” eligible and almost 43% as “extremely”)
- Business models based on circularity (waste or byproducts valorization, recycled scrap/“urban mining”)
- R&D expenditures in clean solutions

RELUCTANCIES

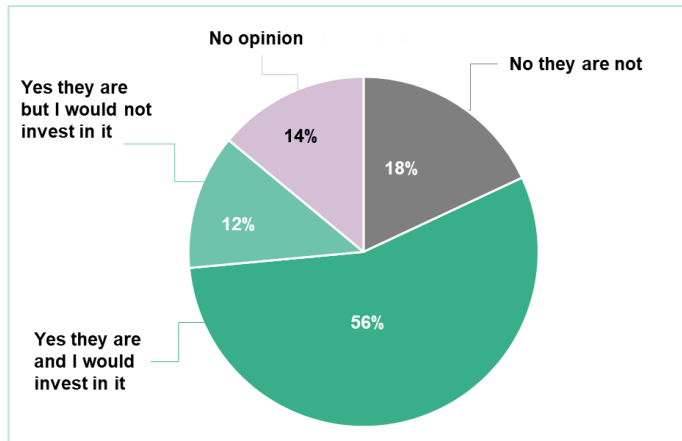
- CCS and other offsetting approaches do not convince investors (6% consider them as “not all eligible”, and almost 40% as “a little “eligible”).
- Refurbishing facilities/plans is not attractive for investors (50% answered “a little”).

“FAIR TRANSITION”

Sadly, in our view because the “just transition” and the management of its social cost is important, almost 50% of the respondents consider retraining programs for the workforce as “a little” eligible.

Transition KPI-linked instruments: appetite is clearly there provided that trust is established

Do you believe sustainability-linked financial instruments tied to KPIs can be a driver of change for brown companies?
If yes, would you invest in such financial instruments?



ANONYMIZED RESPONDENTS' QUOTES

*"We would invest in such instruments after a **case by case analysis**"
[...] "I think any initiative is welcome, but it is a **case by case approach to decide if we invest or not.**"*

*"Only if linked to a **meaningful decarbonization strategy** with a visible time horizon for switch to completely green assets, and with a discount compared to "pure" green loans."*

*"Yes, we would invest, provided the **measurement of such KPIs are checked by independent third party. Trust would be essential here...**"*



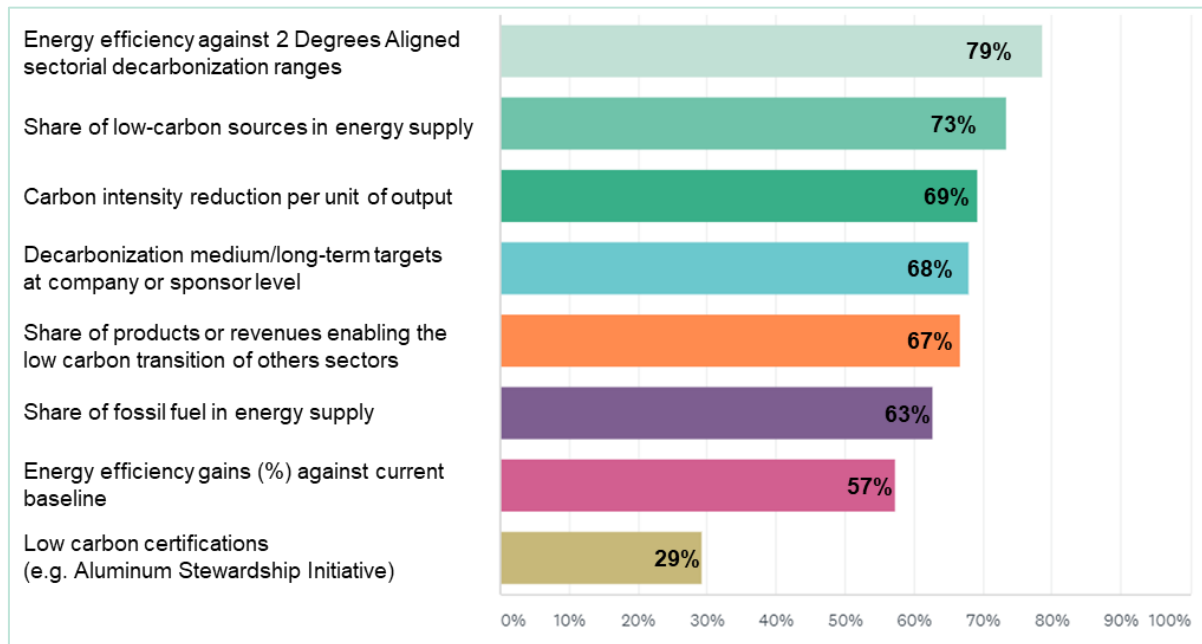
[Click here to access our SLB survey](#)



Nota bene: since 2019, we launched other investor survey, including one on Sustainability-Linked Bonds published in February 2021

Transition KPI-linked instruments: appetite is clearly there provided that trust is established

Which of the following indicators are relevant for assessing the transition ambition (tick if applicable)?



ANONYMIZED RESPONDENTS' QUOTES

*“Unlike a green factor, these indicators can be tailored to the specifics of each company to **make sure the effort is real and backed by a long term strategy**”*

*“They are questionable, as the decision criteria is missing in my opinion for **deciding whether the “sustainability improvement” is in line with Paris agreement (or the like)**. Inclusion of Science based Targets in the sustainability assessment and/or reference to EU Taxonomy would be a requirement”.*

*“Only if **KPIs are clearly defined without any possible distortion in their assessment.**”*

4.3 | INVESTORS' INITIATIVES ON TRANSITION

An extensive range of investment strategies can be used and combined when it comes to supporting energy & ecological Transition. Public institutions can also carry additional constraints (“lead by example”). Main investment strategies and practices on the O&G industry are presented below.

<p>Negative screening / Exclusion and/or Divestment (in full or part, always sequenced)</p>	<ul style="list-style-type: none"> • Case-by-case or rules-based divestment: <ul style="list-style-type: none"> – EIB's new lending policy (ban on fossil fuels with a few exceptions by end-2021) – BlackRock : exclusion of firms that derive >25% of their revenue from thermal coal production from its actively-managed portfolios – Newton IM: exclusion if an internalized cost of carbon at \$140/CO₂ ton produces a negative net income • “Fossil Free” movement (total or partial divestment, e.g., colleges/ universities/ foundations/ charities, especially in the US/UK; but also public entities, e.g. Republic of Ireland, Norwegian GPF). In 2019, >1,110 institutions, with > USD 11tn in AUM had committed to divest from fossil fuels. (1) • Sustainability & thematic funds (specific exclusion guidelines) • Sub-segments exclusion: Arctic exploration, non-conventional fossil-fuels exploration, Deep Offshore drilling, LNG • EU Climate Benchmarks (revenues threshold 10% from oil exploration or processing activities) • Future EU Eco Label for financial Products
<p>ESG integration & best-in-class investing</p>	<ul style="list-style-type: none"> • Integrated ESG risk Management & ESG Scoring (from external providers, and/or internal in-house methodology) • GHG footprint assessment and optimizing • Constituents weighting according to “climate scores”, e.g., based on Transition Pathway Initiative (TPI) assessment
<p>Investor engagement (stewardship activities)</p>	<ul style="list-style-type: none"> • Governance-related investor dialogue (Climate Change AGM Resolutions) • Coalitions-based shareholder dialogue (e.g. Climate Action 100+, Institutional Investors Group on Climate Change, IIGCC)
<p>Green Bonds Purchasing</p>	<ul style="list-style-type: none"> • Green Bond Principles (ICMA) • Climate Bonds Initiative (CBI) Taxonomy • EU GBS (but limited pool of Use-of-Proceeds because of aspirational thresholds from the EU Taxonomy) • Reputational backlash (consistency critics addressed to O&G companies, e.g. high capex in green assets in absolute terms but modest relative share)
<p>Transition KPI-linked instruments</p>	<ul style="list-style-type: none"> • Transition performance priced-in (coupon step-up/down) structures and attached dialogue • Financial Accountability “skin in the game” and forward-looking dimension

(1) USD 11tn and counting: new goals for a fossil-free world. 350.org

Asset owners' strategies regarding the O&G industry

Because of the volume of investment they make, and their long-term horizons, sovereign & pensions funds and insurers are key players for initiating change. If actions have until now concerned mainly the coal industry, asset owners are increasingly paying attention to other fossil fuels.

Sovereign Funds & Pension Funds

Impulse change through the mandates they give to asset managers.

Nordics have multiplied divestment announcements

- **Norway's Government Pension Fund Global (GPFG)**, the world's largest sovereign wealth fund and one of the six founding members of the One planet Sovereign Wealth Fund Working Group, has since 2017 reduced its investments in oil and gas as part of a strategic decision to reduce Norway's overall country exposure to the sector.
- In October 2019, **KLP** – Norway's largest pension fund – divested of its oil sands exposures.
- **PenSam** – a ~USD 20bn Danish pension fund – blacklisted in 2019 26 global oil firms, selling off shares with a total value of EUR 17mm.
- **AP2** - a ~USD 43bn Swedish pension fund - announced in December 2020 it will no longer invest in companies that derive more than 10% of their revenue from oil, or 50% revenue from gas.

Divestment commitments come also from other geographies

- **New York City** said in January 2018 that over five years it would remove fossil fuel investments from its public pension funds, which then had USD 189bn in AUM.
- **The EIB** announced in November 2019 it will stop funding oil, gas and coal projects at the end of 2021, cutting EUR 2bn of yearly investments.

Insurers

Have two main levers for actions:

Progressively retreating from underwriting fossil fuel

- In 2017, **Axa** committed to no longer underwrite new bituminous sands.
- **Generali** has committed not to ensure clients producing fossil fuels from bituminous sands.
- **Swiss Re** is committed to gradually cut business support in underwriting to the world's 10% most carbon-intensive oil and gas production by 2023.

Divesting fully or partially from fossil fuel related assets

- Since 2019, **Generali** is committed not to make new investments in bituminous sands projects, and to divest its residual bond exposure to this sector.
- **Talanx Group** will not make any new investments in companies that generate at least 25% of their revenues from fossil fuel sources.
- **Swiss Re** is committed to gradually cut support in asset management to the 10% most carbon-intensive oil and gas producers by 2023.

Banks

In addition to exclude funding the thermal coal, and sometimes non-conventional O&G activities:

- In September 2020, **BBVA, BNP Paribas, ING, Société Générale and Standard Chartered** published a report on the application of the Paris Agreement Capital Transition Assessment (PACTA) methodology, designed to **steer their credit portfolios towards the objective of the Paris Climate Agreement**.
- **Barclays, Morgan Stanley, JP Morgan and HSBC** have committed to **net-zero financed emission by 2050**.

Investment managers' strategies regarding the O&G industry

Beyond divestment, assets managers are adopting diverse strategies and calendars regarding O&G.

Investors	Oil & Gas Divestment Strategy
Full divestment	
OFI AM	<p>Sep. 2020 - The Ofi Group has announced it will divest from O&G extraction companies by 2050 in a three-stage plan.</p> <ul style="list-style-type: none"> Firstly, Ofi AM will exclude firms making more than 10% of their turnover from oil, shale gas, and tar sands extraction, removing those making more than 5% of turnover from the sectors by 2030. In the second phase from 2030, it will exclude firms starting new exploration projects in the Arctic, gradually removing all companies that extract oil and gas from the region by 2040. In the final stage, Ofi plans to exit the sector fully by 2050 at the latest.
Handelsbanken	Handelsbanken excludes investments companies involved in fossil fuels.
Partial divestment	
Thematic divestment (Arctic drilling, bituminous sands)	
Robeco	Sep. 2020 - Companies that derive >25% of their revenue from thermal coal or oil sands, or >10% from Arctic drilling , will be barred from investment portfolios. The exclusion applies to all of Robeco's mutual funds, excluding client-specific funds and mandates but including sub-advised funds.
Groupama AM	Groupama AM is no longer investing in companies for which oil sands represents more than 15% of their reserves.
Fossil free funds/strategies	
OP AM	Aug. 2020 - OP AM will make OP-Low-carbon World and OP-Sustainable World entirely fossil-free funds. This means that these funds will not invest in producers of fossil fuel or electricity companies that use fossil fuels.
Amundi	Amundi's Green Technology Equity Socially Responsible (SRI) Strategy excludes companies that produce fossil fuels.

NEW STRATEGIES REGARDING O&G

As part of their strategy to decarbonize their portfolios, asset managers are engaging with the O&G sector, but also contemplating investing in new type of sustainable debt instruments:

Investors engagement

At BP's 2019 annual general meeting, shareholders voted overwhelmingly in favor of a motion that will push BP to set out a business strategy aligned with the Paris Agreement's goals. Aviva Investors co-sponsored the resolution with Hermes IM and L&G IM.

As a result of engagement through the Climate Action 100+ in 2019:

- RD Shell released a joint statement committing to a range of industry leading climate commitments, including emissions reduction targets that include scope 3 emissions.
- PetroChina developed a climate change strategy and signaled the company's intention to align its climate policy to the goals of the Paris Agreement.

Transition & KPI-linked instruments

Past months have seen a growing interest of investors for sustainability-linked products...

...Sustainability-linked bonds & loans (coupon or margin tied to sustainable KPIs) could further encourage O&G companies to align their activities with the Paris Agreement, and thus make progressively their business model evolving.

INTERVIEW

TRANSITION ASSESSMENT METHODS IN THEIR INFANCY BUT ALREADY CRUCIAL



JULIEN BRAS
Green Bond Portfolio Manager,
AllianzGI



- “ We have three pillars for green bonds screening: i) alignment of the Framework with the Green Bond Principles; ii) the content and features of the underlying projects or assets (on the basis of an internal taxonomy, largely derived from CBI with slight adjustments) and iii) **the ambition and credibility of the issuer’s climate-change and decarbonization strategy.** ”
- “ ... the concept of transition is thoroughly considered and is at the core of the investment decision. ... **And we are not keen to invest in green bonds if we are not presented a clear transition strategy with ambitious targets.** ”
- “ **We have the willingness not to focus only on the best players but to encourage progress approach** and we even think that it is the best way to really generate an impact in the context of this investment solution. ”
- “ **It is necessary for us that the company has a medium-term transition plan.** We cannot require Science Based Targets (see SBTi) because for the moment, it would reduce too drastically the universe. That being said, we pay much attention to this question of credibility and ambition. To do so, we scrutinize if the management is supportive and involved in such a green bond program and whether it is likely to be a “one-off”. We have a strong preference for repeat issuers. ”
- “ **The main hurdle [for KPI-linked instruments] is the sound selection of indicators and how transparent and robustly calibrated indicators would be.** ”

The full interview is available here



INTERVIEW

PRINCIPLES-BASED RED LINES FOR AN IN-DEPTH TRANSITIONING INVESTOR DIALOGUE



VICTORIA BARRON
Former Responsible Investment
Analyst, Newton Investment
Management



- “ **[For the red line related to climate change], we felt that a principles-based approach better captures the nuances of business operations.** For example, through excluding gas producers you could also end up excluding utilities who are making big strides in renewable energy.
- “ **In our strategy, companies that are heavy emitters, which would be unprofitable under a certain carbon pricing** [$\$140/\text{CO}_2$ ton based on IEA World Energy Outlook 450 ppm scenario], and which have no current intention of transitioning, **are not investable.**
- “ **The preparedness of an actor can also be very hard to assess from a hard/data metric approach,** so when we do our ESG analysis, we also go through a company’s reports and take a view on how active they are being.
- “ **Under this red line, around 9% of companies from the MSCI AC World Index are currently excluded, including various energy and mining companies, as well as certain airlines and utilities.**
- “ **We analyze many data points, including a company’s scope 1 and 2 emissions on an absolute and intensity-level basis, and how a business compares to its peers.** Data analyzed will include: TPI, CDP, SBT, Bloomberg data, a company’s own data, and that of our ESG service providers. [... the proprietary overall ESG] score takes a view on whether we think the company is going to improve in the future, based on current efforts.

CHART | Climate Change Red Lines

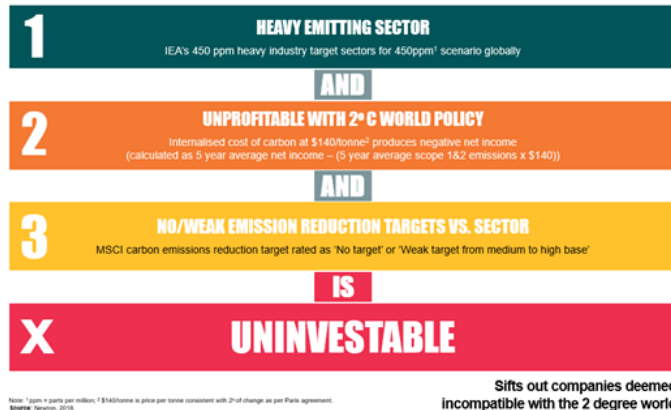


Illustration of Newton Investment Management's climate change red line process
Source: Newton Investment Management.

The full interview is available here



4.4 | TRANSITION & SUSTAINABILITY-LINKED BONDS

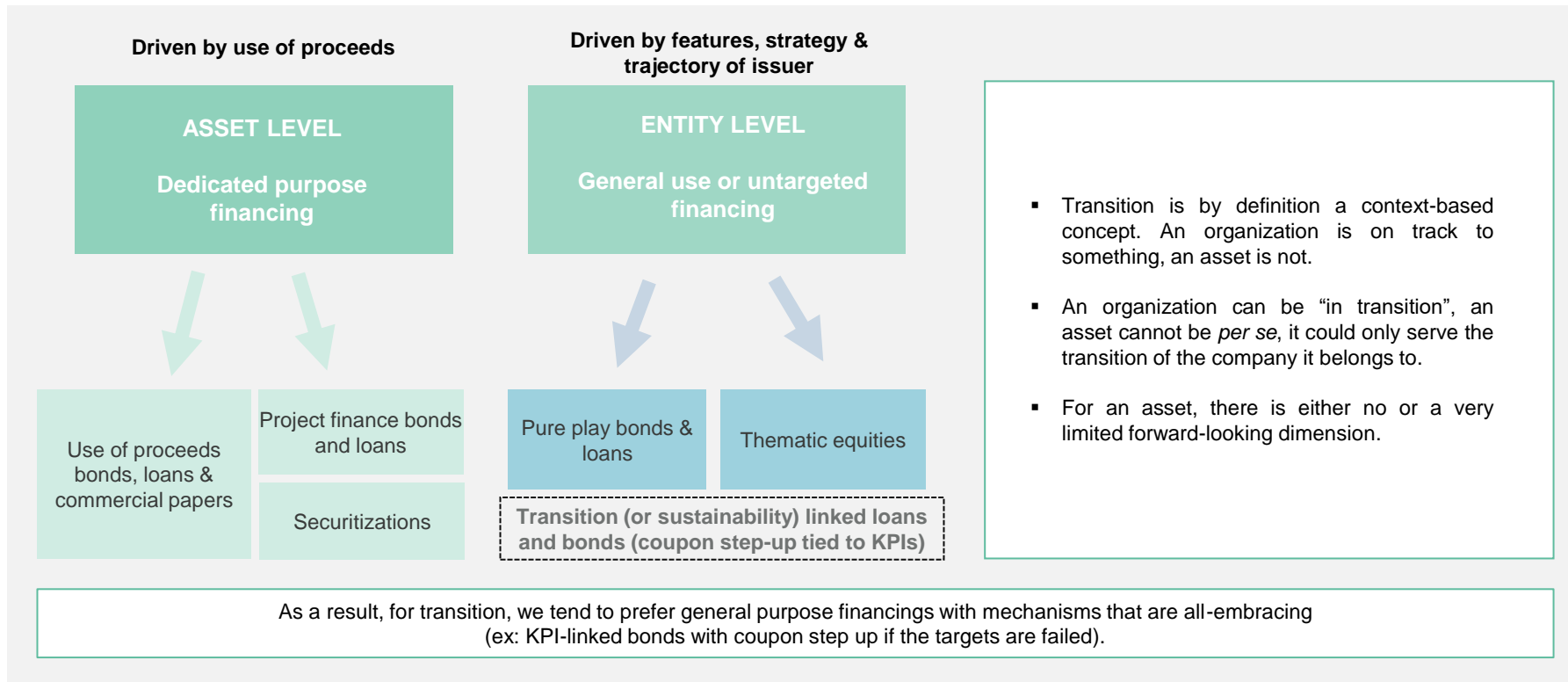
Why consider Green & Sustainable Financing ?

When funding meets sustainability: breakdown between **constraints & opportunities**

Pressure on business models	Regulatory environment	Market development
<p>Cost & risk management</p> <ul style="list-style-type: none"> Consequences for the top line: obsolescence of certain technologies / emergence of a low-carbon economy / changing consumer habits Emerging risks related to resource management, stranded assets, energy costs A matter of transparency & reporting 	<p>New sustainability related policies</p> <ul style="list-style-type: none"> Alignment with national & international agendas related to climate change and environment Acceleration of market regulation (E.U. Sustainable finance action plan, Sustainability disclosure requirements, 2030 Agenda – SDGs roadmaps disclosure) 	<p>Growing standardization & expectations</p> <ul style="list-style-type: none"> Acceleration of market standardization (ICMA, LMA, sustainable finance products development) Pressure from investors Peers' differentiation less relevant
Communication & image	Investors & lenders appetite	Internal engagement
<p>Support Sustainability Strategy</p> <ul style="list-style-type: none"> Set foot in the sustainable finance market Secure funding allocated to projects and activities with recognized environmental/social added value Positive impact on reputation and credibility (ESG evaluation) 	<p>Address new expectations & diversify</p> <ul style="list-style-type: none"> Investors strategic shifts towards sustainable finance (quantified commitments) Increasing demand for green assets & investment opportunities leading to diversification and attraction for issuers Investors with own reporting expectations on their investment portfolios 	<p>Virtuous circles and continuous improvement</p> <ul style="list-style-type: none"> Set-up/improve internal environmental management systems such as environment & climate accounting and reporting Support evolution of company practices, procurement... Increase sustainability performance & identify internal levers

Transition finance compass

Use-of-proceeds or general corporate purpose financing?



Definition of Sustainability-Linked Bond Principles

Introduction

- Sustainability-Linked Bonds **incentivize the issuers' achievement** of material, quantitative, pre-determined, ambitious, regularly monitored and externally verified **sustainability (ESG) objectives**
- The Sustainability-Linked Bond Principles ("SLBP") provide guidelines that recommend structuring features, disclosure and reporting and position integrity protection at the heart of the guidance.
- **Natixis was co-chairing the SLBP working group** under ICMA secretary.

Definition – Sustainability-Linked Bonds

Sustainability-Linked Bonds ("SLBs") are any type of bond instrument for which the financial and/or structural characteristics can vary depending on whether the issuers achieve predefined Sustainability/ ESG objectives.

In that sense issuers are committing to future improvements in sustainability outcome(s) within a predefined timeline. It is a forward-looking performance-based instrument.

Those objectives are measured through predefined Key Performance Indicators (KPIs) and assessed against predefined Sustainability Performance Targets (SPTs)

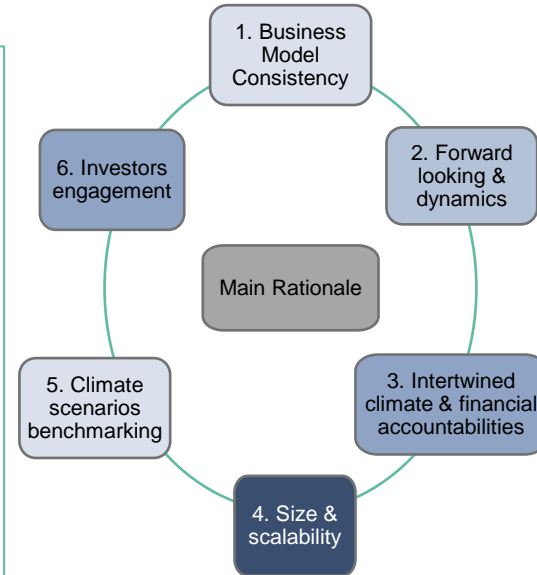
SLBs are intended to be used for general corporate purposes, hence the use of proceeds is not a determinant in its categorisation.

The SLBP have five core components :

- **Selection of Key Performance Indicators (KPIs)**
- **Calibration of Sustainability Performance Targets (SPTs)**
- **Bond characteristics**
- **Reporting**
- **Verification**

SLBP recommend that the issuers publicly communicate, about the selection KPI(s) (i.e. relevance, materiality), the SPT(s) (i.e. ambition level and consistency with overall strategic planning), trigger events for change of bond characteristics, intended post issuance reporting and external review format, as well as overall issuers' representation of the alignment with the SLBP.

Such disclosure may take place in the bond documentation and/or on the issuers' webpage, a dedicated framework, external reviews, or investor presentation, etc.



Core components of ICMA's Sustainability-Linked Bond Principles

1 Selection of KPI(s)

- **Relevant, core and material** to the issuer's **overall business**, and of **high strategic significance** to the issuer's **current and/or future operations**
- **Measurable or quantifiable** on a **consistent methodological basis**
- **Externally verifiable**
- Able to be **benchmarked** (i.e., as much as possible using an external reference or definitions making the ambition assessment of SPTs possible)

2 Calibration of SPTs

- The SPTs should be **ambitious**:
- Represent a **material improvement** in the respective KPIs and be beyond a "Business as Usual" trajectory
 - Where possible be compared to a **benchmark** or an **external reference**
 - Be consistent with the issuers' overall **strategic Sustainability / ESG planning**
 - Be determined on a **predefined timeline** set before (or concurrently with) the issuance of the bond

The target setting exercise should be based on a combination of benchmarking approaches:

- **The issuer's own performance over time** : track-record of 3 years is recommended and forward-looking guidance on the KPI when possible; and
- **The issuers' peers** i.e., the SPT's relative positioning versus its peers' where available (average performance, best-in-class performance) and comparable, or versus current industry or sector standards; and/or
- **Reference to the science**, i.e. science-based scenarios, or absolute levels or to official country/regional/international targets (Paris Agreement on Climate Change and net zero goals, Sustainable Development Goals (SDGs), etc.) or to recognized Best-Available-Technologies or other proxies to determine relevant targets across environmental and social themes.

3 Bond characteristics

- **Bond financial and/or structural characteristics** should vary **depending on whether (or not) the selected KPI(s) would reach the predefined SPT(s)** i.e., the SLB needs to include a financial and/or structural impact involving trigger event(s).
- Potential variation of the coupon is the most common example, but it is also possible to consider other variations
- Variation of the bond financial and/or structural characteristics should be **commensurate and meaningful** relative to the issuers' original bond financial characteristics.
- **Necessary element of the bond documentation**: The KPI(s) and SPT(s) definition (including calculation methodologies) and the potential variation of the SLB's financial and/or structural characteristics.
- **Any fallback mechanisms in case the SPTs cannot be calculated or observed in a satisfactory manner, should be explained.**
- Issuers may consider including language in the **bond documentation** to take into consideration potential exceptional events or extreme events, including drastic changes in the regulatory environment that could substantially impact the calculation of the KPI, the restatement of the SPT, and/or proforma adjustments of baselines or KPI scope.

4 Reporting

To be kept readily available & **regularly published**, at least annually and in case for any date/period relevant for assessing the SPT performance:

- Up-to-date information on the performance of the selected KPI(s), including baselines where relevant
- A verification assurance report relative to the SPTs outlining the performance against the SPTs and the related impact, and timing of such impact, on the bond characteristics
- Any information enabling investors to monitor the level of ambition of SPTs

5 Verification

- **Independent and external verification** of performance level against each SPT for each KPI by a **qualified external reviewer** with relevant expertise (an auditor or an environmental consultant)
- **At least once a year** and in any case for any date/period relevant for assessing SPT performance leading to a potential adjustment of SLB financial and/or structural characteristic
- Verification of the performance against the SPTs should be made **publicly available**

External review : SPO: recommended

Recommendation to appoint (an) **external review provider(s)** to confirm the **alignment of their bond with the five core components** of the SLBP (such as a SPO)

Suggested mandate includes the assessment of :

- the relevance, robustness and reliability of selected KPIs,
- the rationale and level of ambition of the proposed SPTs, the relevance and reliability of selected benchmarks and baselines,
- the credibility of the strategy outlined to achieve them, based on scenario analyses, where relevant.

Post issuance, in case of any material change to perimeter / KPI methodology / SPT(s) calibration, issuers are encouraged to ask external reviewers to assess any of these changes.

In cases where no SPO sought, it is recommended that issuers demonstrate (and document) or develop the internal expertise & processes to verify their methodologies..

Topics left to market innovation and/or Q&A

- Nature of financial and/or structural characteristics
- Examples of KPIs, benchmarks, references
- Documentation & structuring of changes in KPI & SPTs
- Exclusions / Do No harm approaches / Minimum ESG performance for issuers
- Programmatic or bond specific approach
- Detail on what "meaningful" and "commensurate" can mean?
- ECB eligibility discussion
- Articulation with GBP/SBP or transition bond.

A need for disruption – Breakthrough Use-of-Proceeds

Net carbon neutrality requires tackling “hard-to-abate” emissions via technologies that are not yet commercially available. Some “infant technologies” need to be considered as eligible due to their tremendous potential though they are riskier.

Use-of-Proceeds-based financing has limits in terms of “**transition spillover or impact**” since individual assets or projects hardly inflect the overall position of the company (especially to energy efficiency related projects, which are also fraught with carbon lock-in risks).

Andreas Schroeder, Tiffany Vass, Laura Cozzi from the International Energy Agency (see their interview “[The instrumental role of industry decarbonization in IEA’s Sustainable Development Scenario](#)”) identify some of the frontier technologies to watch:

Electro-technologies for process heat, such as infrared and ultraviolet heating

(with applications in drying and curing processes), induction melting and electric boilers for electrification across a range of industrial activities.

The electrification of clinker production

using induction or microwave heat for the cement sector’s most energy-consuming step (still at the laboratory stage).

An attractive option to indirectly electrify industrial high-temperature heat

either *via* direct combustion or blending with natural gas.

Mechanical vapor recompression

providing higher temperature heat than what is practicable using heat pumps. Such technology could be beneficial in pulp and paper and certain chemical production processes, though to be economically viable it requires low electricity prices (relative to natural gas).

Hydrogen-based direct iron reduction for primary steel production

to substitute coal or natural gas. Experts suggest that 100% electrolytic hydrogen-based steel production is not sufficiently advanced to be exploited before 2030. Partial injection of hydrogen is possible up to about a quarter without major process transformations but is highly dependent on economics

Example with the Steel industry: navigating Use-of-Proceeds and Sustainability-Linked Bonds

Technologies or **processes** can be used either as Use-of-Proceeds or as to determine KPIs (for example, the share of the total production delivered or derived given technology, or the share of CAPEX dedicated to such technology).

Another indicator is the mix between **a technology and its outcomes** (e.g., the amount of CO₂ captured through CCS over a given period).

Technology	Description	Use-of-Proceeds	KPIs usable for SLBs	Impact indicators related to the technology
Hydrogen as a reducing agent	Avoiding carbon and using hydrogen to reduce iron ore thereby averting the creation of CO ₂ and producing H ₂ O (water) instead.	Investment in facilities to enable the use of H ₂ as reducing agent (replace blast furnace sites with large sponge iron production site (by direct reduced iron with hydrogen produced using the hydropower)	Share of new manufacturing capacities that can use hydrogen as reducing agent (hydrogen powered production)	Carbon intensity reduction achieved through the use of hydrogen as reducing agent
Carbon Capture and Storage (CCS)	Generating a clean and concentrated CO ₂ stream that can be captured and stored.	Retrofitting expenditures to equip steel plants with capture technologies, build transportation networks, access to storage sites, etc.	Share of facilities equipped with CCS technologies or number of facilities equipped with CCS	Tons of CO ₂ sequestered over a period of time
Carbon Capture and Utilisation (CCU)	Using the components of the co-product gases from existing processes to produce fuels or input material for the chemical industry.	Investment in facilities to enable CCU	Share of steel plant equipped with CCU technologies	Tons of CO ₂ captured and converted into fuels or chemical industry inputs
Electrolysis	Reducing iron ore using electricity	Investment in electrolyzers	Number of electrolyzers installed/deployed	Steel carbon intensity improvement due to electrolysis

Transition & Sustainability-Linked Bonds: Who is eligible ?

Features to display for “alleged transitioner”

We propose criteria formalizing transition patterns that are illustrative of desirable transition features

1

Historically or predominantly belong to a **high emitting sector**



2

Disclose **scope 1 to 3 emissions** with consistency & accuracy



3

Diversifying range of products & services with a focus on decarbonization solutions (“*greening by*”) and increasing green revenues



4

Have at least 3 years track-record self-decarbonization above 5% per annum but **without all abatement potential exhausted**



5

Being able to share **documented emission reduction forecasts** over the next 5, 10, 15, 20 years.



6

Have **set evidence-based decarbonization targets** (based upon scenario analysis and sectorial decarbonization pathways)



Our 4-question radar

Is it ambitious?

Is it consistent?

Is it game-changing?

Is it enough?

Four criteria can be evaluated:

Assessing transition profile, pathways and claims of companies

- What is the big picture of the sector the company belongs to?
- Where does the company come from?
- Where does it stand now? Where is it going, at what speed?

#1

WILLINGNESS

#2

PREPAREDNESS

#3

AMBITION

#4

ACTION

#1

WILLINGNESS

It is a bedrock for analysis & engagement and demonstrates the goodwill of the company which provides enough transparency to evaluate its transformation. It enables understanding the situation from which the transition must begin or be continued, and against which progress must be monitored.

Disclosure

Scope 1 & 2 emissions not disclosed

No explicit climate policy nor process to manage climate risks

GHG emissions verification under ISO 14064-1 Standard

Reporting on verified Scope 3 emissions

Adhesion & implementation of TCFD recommendations

Scenario analysis & planning based upon 2°C compatible scenario & key assumptions disclosure

Transition *laggards*

#2

Our 4-question radar

PREPAREDNESS

It is mostly a backward & present looking analysis to take stock of what has been achieved, what is necessary next (completion level of the transition), and how credible ambitions are. It also touches upon adaptive capacities & ability to accelerate.

Performances & capacities

Steady growth of absolute GHG emissions and carbon intensity

Exit from dark brown activities (e.g., coal, tar sands) not completed nor imminently scheduled

Diversification (e.g., M&A) operations towards low-carbon or enabling activities successfully completed

Alignment with sectorial decarbonization intensity Benchmarks

GHG absolute emissions peak achieved

GHG absolute emission trends reversal (degrowth)

Transition *laggards*

#3

AMBITION

It is about the way the vision or strategy is translated into goals publicly endorsed. It enables assessing whether it is enough with regards to climate science and whether it is demanding and game-changing for the company and the sector .

Targets

Absence, vague, or only long-term targets (2040, 2050)

Scope 1 –2 reduction targets above sectorial average

Short & medium-term (~2025-2030) Scope 3 reduction target if Scope 3 emissions account for ≥ 40% of total emissions

Science-based Target (SBTi) validation

Carbon net neutrality targets

Transition *laggards*

Our 4-question radar

#4

ACTION

It is about how the company actually acts, the investment made, the managerial mechanisms in place and stakeholders' engagements. It touches upon the consistency of the different measures to assess whether they all head in the same direction.

Efforts							Share of low-carbon energy in total CAPEX (e.g., ≥ 10-15% for O&G companies until 2025, 20-25% from 2025 to 2030, etc.)
Investments in high breakeven price fossil fuels related activities	Zero or little diversification towards low-carbon energy (as a producer or for power supply)	Quantitative & time-frame bottom-up transition plan	Large-scale investments in carbon natural sinks or CCS	Workers retraining programs or pre-retirement schemes	Share of R&D dedicated to decarbonization ≥ 40%		

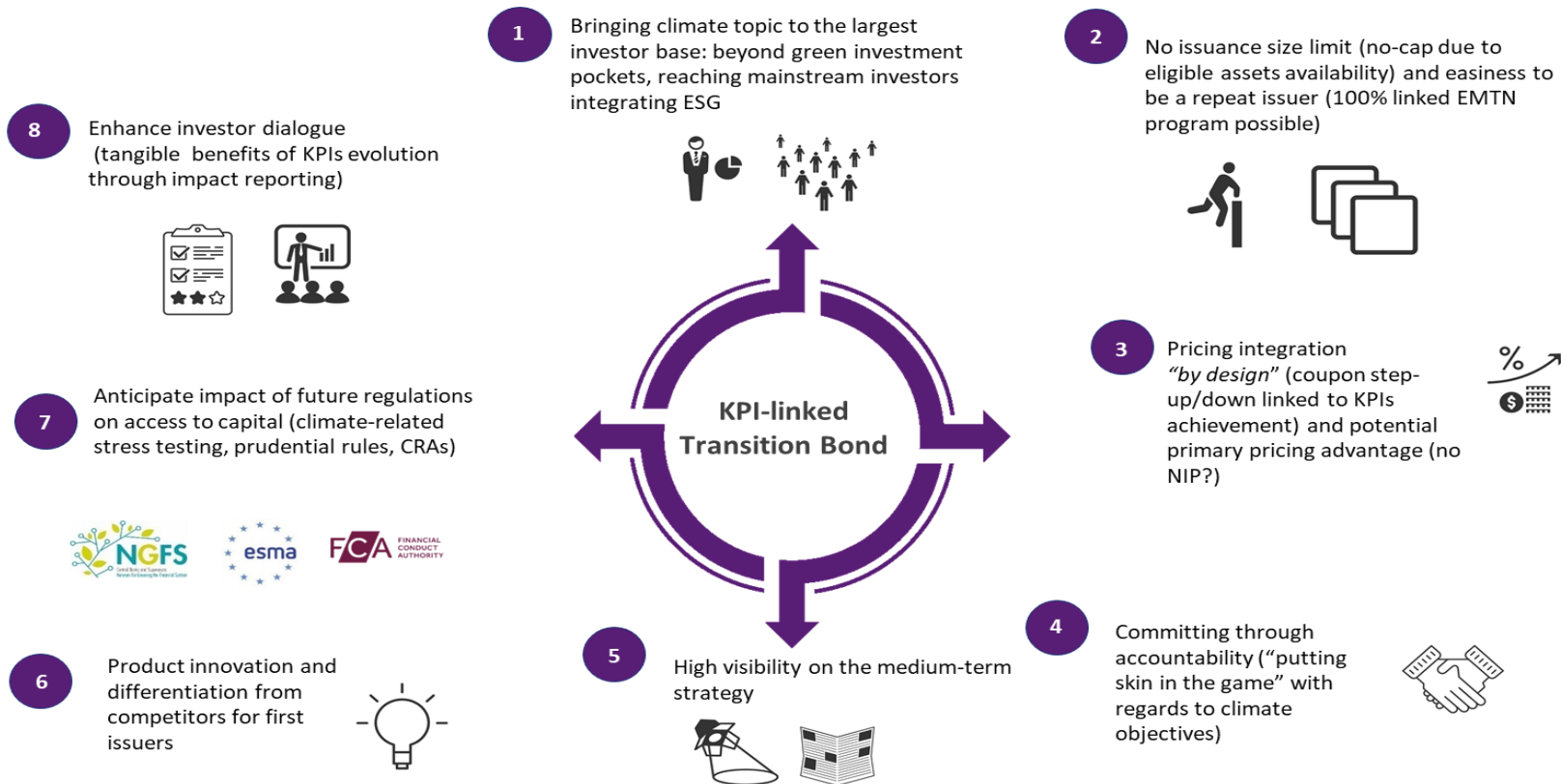
Transition laggards

Governance/decision-making processes

Lobbying against climate change action (trade associations)	Climate targets annual or biannual basis review	Variable remuneration of executives linked to climate-change & other targets accountability mechanisms	Internal Carbon Pricing & climate stress testing
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Transition laggards

Eight arguments in favor of sustainability-linked bonds for high-emitting companies



Transition & Sustainability-Linked Bonds: Three main steps

1

Choice of the Key Performance Indicator(s)

EXAMPLES

- Carbon intensity of sold products
- Share of low-carbon electricity and natural gas in sales mix in 2040
- Total renewable installed capacities

2

Calibration of the end target (or range) and potential intermediary milestones

EXAMPLES

- 20% by 2020 versus 2015 baseline
- Between 20% and 25% by 2020 *versus* 2015 baseline
- 13% by 2017, - 15% by 2018, - 18% by 2020 versus 2015 baseline

3

Basis Points (BPS) adjustment calibration

EXAMPLES

- Coupon step-up of 10/15 bps in case of target(s) failure
- NB: From an IFRS perspective, KPI-linked bonds should be accounted at amortized cost, meaning that the step up would be capped at the double of the investors initial rate of return (IFRS 9.B4.3.8a).

Resources for KPIs Selection & Calibration

Natixis' methodology uses those resources to structure robust sustainability-linked instruments

KEY FEATURES

Guidance on extra financial information disclosure (including metrics & indicators)



WHAT KPIs TO CHOOSE

Guidance in the identification of relevant KPIs

Corporates



77 industry standards

Moody's
ANALYTICS

Carbon Transition
Assessment for ~ 15
sectors



Industry-led initiatives

SSAs



2030 Agenda relevant to relate but not usable as such for corporates (by contrast, UN 169 targets and 232 indicators usable as they stand for countries, regions, or municipalities issuers), or assessment providers (alignment, efforts, etc.)

Is it enough?



Guidance in the identification & calibration of relevant sectorial KPIs



Technical screening criteria (threshold for 67 economic activities)

Is it credible?

Guidance in the feasibility evaluation of the KPIs (is the company on track, are actions set at the right level & timescale?)

ACT

ACT Retail methodology
ACT Electric Utility methodology
ACT Auto manufacturing methodology

Resources for KPIs Selection & Calibration

Natixis' methodology uses those resources to structure robust sustainability-linked instruments

When regulation is absent or piecemeal for some sectors regarding sustainability topics, and guidelines or classifications such as the EU Taxonomy of Sustainable Activities **do not exist either, industry-led initiatives might provide useful tools to benchmark performances within sectors, identify KPIs and calibrate targets.** The table below identifies some of the industry associations and provides examples of resources.

Those must be considered carefully as they are by nature **biased**, are prone to green washing and might be inclined to preserve the *status quo*. However, “self-regulation” has often proven in some cases to be useful and laying the foundations for hard law. For instance, the Green Bond Principles (GBP), forged through the International Capital Market Association (ICMA), revealed to be **an effective and transformative tool**. As evidence of that, the future EU Green Bond Standard mimics the GBP. On other topics, the OECD, which only produces **guidelines and soft law standards, has been able to unleash substantial transformations**, for instance on tax topics (Base Erosion Profit Shifting, BEPS), where international organizations and usual governance have failed to deliver.

Lastly, there are international, regional, and domestic associations. Some are general industry associations, some are focused on environment and sustainability, and some appear to be “traditional” lobbies. Many of them work with ISO on industry standardization.

SECTOR	INDUSTRY ASSOCIATIONS	EXAMPLES OF INITIATIVES/RESOURCES
Car	<ul style="list-style-type: none"> European Automobile Manufacturers Associations (ACEA) Japan Automobile Manufacturers Association (JAMA) 	<ul style="list-style-type: none"> Position paper (e.g. plan to help implement the European Green Deal) Factsheet (data, guidance, best practices, benchmark)
Shipping	<ul style="list-style-type: none"> International Maritime Organization (+ISO) Sustainable Shipping Initiative International Chamber of Shipping (+ISO) World Shipping Council (+ISO) 	<ul style="list-style-type: none"> Energy Efficiency Design Index (EEDI) for new ships (index that estimates g of CO₂ per ton-mile).
Oil & Gas	<ul style="list-style-type: none"> International Petroleum Industry Environmental Conservation Association International Association of Oil & Gas Producers Oil and Gas Climate Initiative (OGCI) 	
Petrochemicals	<ul style="list-style-type: none"> International Council of Chemical Association (including Solvay, BASF, Dow Chemicals, Sasol, DuPont...) Gulf Petrochemicals and Chemicals Association European Petrochemical Association 	<ul style="list-style-type: none"> ICCA's Building Technology Roadmap

Resources for KPIs Selection & Calibration

Natixis' methodology uses those resources to structure robust sustainability-linked instruments

SECTOR	INDUSTRY ASSOCIATIONS	EXAMPLES OF INITIATIVES/RESOURCES
Meat industry	<ul style="list-style-type: none"> Sustainable Agriculture Initiative Platform International Meat Secretariat (but does not necessarily have resources on sustainability) Livestock and Meat Commission (Northern Ireland) Meat & Livestock Australia Meat Industry Association of New Zealand 	For example, Meat & Livestock Australia invests (up to \$5.7m per year) in environmental and sustainability R&D , and create reports.
Iron & steel	<ul style="list-style-type: none"> World Steel Association (+ ISO) The European Steel Association (EUROFER) China Iron and Steel Association (CISA) 	<ul style="list-style-type: none"> Sustainable Development Charter Position papers that identifies technologies Low Carbon Roadmap Energy efficiency and pollution reduction resources (available only in Chinese), annual industry meetings and events, including one on environmental protection
Cement	<ul style="list-style-type: none"> Global Cement and Concrete Association The European Cement Association (Cembureau) + ISO China Cement Association 	<ul style="list-style-type: none"> GCCA Sustainability Guidelines, Sustainability Charter
Aluminum	<ul style="list-style-type: none"> World Aluminum (International Aluminum Institute) – organization in cooperation with ISO The Aluminum Association 	<ul style="list-style-type: none"> Sustainability materials

Fair transition Use-of-Proceeds

Overview of possible categories of just transition-related expenses

- Several suggested eligible proceeds below are not CAPEX but we believe that OPEX would be eligible and accepted by the market in the light of a fair transition and employee's considerations.
- The EU Green Bond Standard opens the door to green OPEX and some examples of Sustainable Bonds including retraining expenditures can be seen in the market (see for instance [CDC's sustainability framework](#))

	Transition : Exit from highly emitting fossil-fuel facilities	Fair transition : mitigating social impacts of transition	
		Active / retraining measures	Compensatory measures
Use-of-Proceeds	<p>Decommissioning</p> <ul style="list-style-type: none"> • Electrical generating units shut down • Removal of coal, electrical generating equipment & hazardous material from the generation process and buildings (e.g. asbestos) <p>Remediation & rehabilitation</p> <ul style="list-style-type: none"> • Investigation and cleanup of hazardous materials <p>Redevelopment & Repurposing</p> <ul style="list-style-type: none"> • Including compliance to potential legal requirements but also covering redevelopments and repurposing 	<ul style="list-style-type: none"> • Training and re-training programs ahead of exit plans and concomitantly • Career advice • Help employees with job search • Mentoring and coaching • Entrepreneurship and business creation 	<ul style="list-style-type: none"> • To maintain a level of income • Financial allowances • Geographical Mobility/relocation allowances • Pre-retirement schemes
Output & Impact indicators	<ul style="list-style-type: none"> • Total fossil fuel capacities decommissioned (in MW) • Absolute GHG emission reduction (yearly basis) • Impact on a company's carbon intensity • Air pollution reduction (dust, asbestos) • Water & soil pollution reduction (in % vs. legal thresholds) • Land rehabilitation and natural capital (fauna biodiversity) 	<ul style="list-style-type: none"> • Number of beneficiaries (breakdown by age, gender, diploma) • Numbers of jobs preserved on site • Number of hours of (re) training • Number of trained/graduated employees • Internal mobility allowed • Number of employees who found a job either elsewhere in the company or outside it within XX months of closure (of which, in low-carbon sectors, recycling, repair, rent activities) • Local economy metrics 	

INTERVIEW

TRANSITION BOND MARKET: REGARDLESS OF FINANCING FORMATS, THE MAIN QUESTION IS WHETHER THE ISSUER IS ON THE PATH TO A CREDIBLE CLIMATE TRANSITION



YO TAKATSUKI

Former Head of ESG Research and
Active Ownership, AXA IM



*We are very active buyers of Green Bonds and currently hold investments worth **around 5.5 billion Euros in this rapidly growing sector.***

We have found no major equity or bond benchmark that has a current alignment close to the +1.5°C limit sought by COP21. We need to switch our focus to the middle part of the portfolio – the section which is neither the most nor the least carbon intensive.

*Fortunately, there are many ways we can make genuine progress in decarbonizing the world economy. They include challenging carbon-intensive companies **in one-to-one engagements and participating in collaborative initiatives** such as Climate Action 100+ or the Powering Past Coal Alliance.*

*So last June, we published a call-to-action which sought the establishment of a new fixed income asset class called **Transition Bonds**. We believe **it is important that companies which are committed to meaningful decarbonisation at the corporate-level and which can adequately evidence progress should be able to secure stable and long-term through the Transition Bond market.***

*We all talk about companies having an over-arching multi-decade climate policy but **the truth is that senior executives and board directors of many of the companies we engage with are only starting to understand and acknowledge the scale of the changes required to mitigate global warming.***

*The most important aspect of both these financing approaches (Use-of-Proceeds and KPI-linked Bonds) is that they are first and foremost looking at what is happening at the issuer-level. **The big question being posed as a condition of financing in both is whether the issuer is on the path to a credible climate transition or not. So, I am encouraged that both these approaches are focusing on that part.***

The Use-of-Proceeds [approach] is about corporate expenditure as evidence – and that transparency is important to investors”. The other [KPI-linked] is about tracking key performance indicators over the maturity of the bond. I see a lot of synergies because ultimately, they want to achieve the same goal.

*With regards to KPI linked formats – **the challenge will be to convince investors that the KPI selected by corporates is the most appropriate measure** and that the targets in place are ambitious/stretching or not. We also will need to know the likelihood of the targets being achieved. This will determine whether the outcome of a KPI target being achieved – such as the coupon stepping up or down has any value to it.*

[The full interview is available here](#)



“Financing Credible Transition” report



In September 2020, Climate Bonds Initiatives & Credit Suisse published the “Financing Credible Transition” paper, presenting a framework defining an economy-wide credible transition pathways.

It is **inclusive** (traditionally “green” and “brown” actors), **flexible** by addressing whole entity transitions, broad enough to encompass both tied (use-of-proceeds) & general-purpose finance, and sets a high bar, requiring operating performance to be aligned with Paris Agreement targets.

A Transition Framework with 5 categories of economic activities based on the nature of their role in a global, economy-wide transition to the Paris Agreement targets is provided (see infographic below). **Enabling Activities** are considered to cut across all of the categories.

A broader scope than the EU’s definition of “transition”

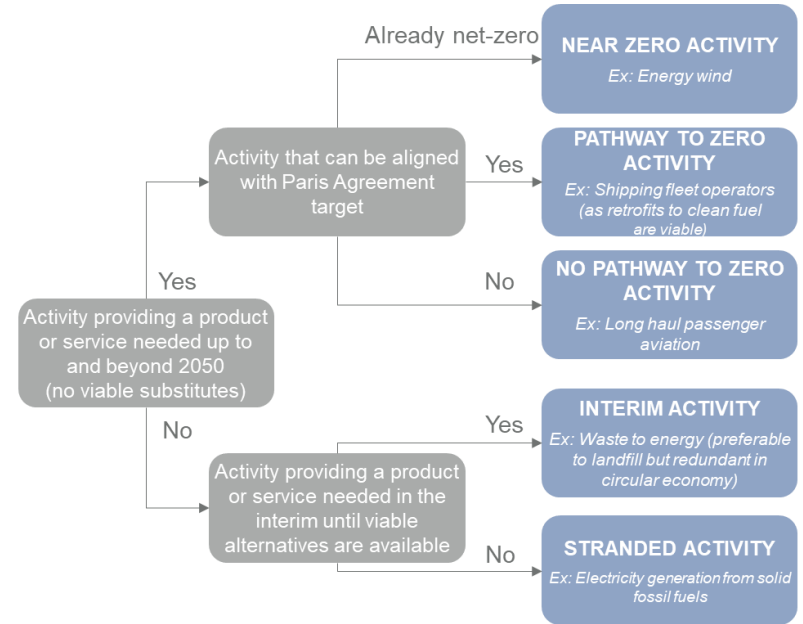
Inclusion of activities needed for an **interim period** (see activity typology below).

- **Consideration of measures reducing emissions/ increasing sequestration** (only addressed in the EU Taxonomy for a limited number of activities).
- Distinction between “**pathway to zero**” & “**no pathway to zero**” (both categories defined under “transitional activities” defined as activities which are not currently close to a net-zero carbon emissions level and therefore must significantly enhance their performance, without lock-in to carbon-intensive assets or processes).

Examples of credible transition measures

Type of activity	Towards a credible transition actions
Pathway to Zero	Decarbonize as fast as possible along appropriate transition pathways.
No pathway to zero	Reduce emissions as much as possible without locking-in technologies that might prevent future rapid decarbonization.
“Interim” activities	Phase out in line with their future sunset date, but in the meantime decarbonize them as fast as possible along appropriate transition pathways.
Stranded’ activities	Phase out, but at the same time take measures that can deliver substantial emissions reductions without locking in those stranded assets & technologies.
Enabling activities	The objective is that the activity makes a substantial contribution to facilitating another activity to follow an appropriate transition pathway. Their own decarbonization is a secondary priority.

CHART | 5 transition categories



“Financing Credible Transition” report

The report set five “Transition Principles” defining the characteristics of credible transition pathways in order to avoid greenwashing. Credible transitioning entities & economic activities are those that are **already following and will continue to follow such pathways** - not setting targets for future alignment.

Summary table of the Transition Principles for activity and entity level transitions

Principle	Details
Credible transition goals & pathways align with 1.5°C global warming limits	<ul style="list-style-type: none"> Transition goals & pathways need to be aligned with global targets for net zero emissions by 2050 and a nearly halving of emissions by 2030. Compatibility with Nationally Determined Contributions [...] is not automatically sufficient. Neither are pathways that are exclusively defined as best-in-class benchmarks (ex: best available technologies).
Credible transition goals & pathways are established by the climate science community and are not entity specific	<ul style="list-style-type: none"> The expertise of the climate science community & technical experts is needed [...]. Using science as a common base for transition pathways, maximizing the action of global emissions reductions & ensuring comparability between transitioning activities & entities in the same industry.
Credible transition goals & pathways do not count offsets, but should count upstream scope 3 emissions	<ul style="list-style-type: none"> Pathways should not account for emissions reductions generated through separate activities, including purchased offsets, but should address scope 1 and 2 and upstream scope 3 emissions as far as this is practically possible.
Credible transition goals & pathways consider technological viability, but not economic competitiveness	<ul style="list-style-type: none"> Development of transition pathways must include an assessment of current & expected technologies. Where a viable technology exists, even if relatively expensive compared to business-as-usual technology, it should be used to determine the appropriate decarbonization pathway for that economic activity.
Credible transition means following the transition pathway – pledges, policies and strategies alone are not sufficient	<ul style="list-style-type: none"> Actual operating metrics are the key indicators of performance, not simply pledges or the implementation of policies and procedures that may or may not deliver operational outcomes. Activities/ entities must be able to credibly demonstrate how they will follow the transition pathway over the financing term, and regular assessment is required to demonstrate that transition is continuing at the necessary scale and pace. In some situations, this will require activity/ entity level decarbonization plans and targets matched to the financing term

Transition action needs to be deployed at 3 levels



Credible measures to reduce emissions/ increase sequestration within activities/entities should:

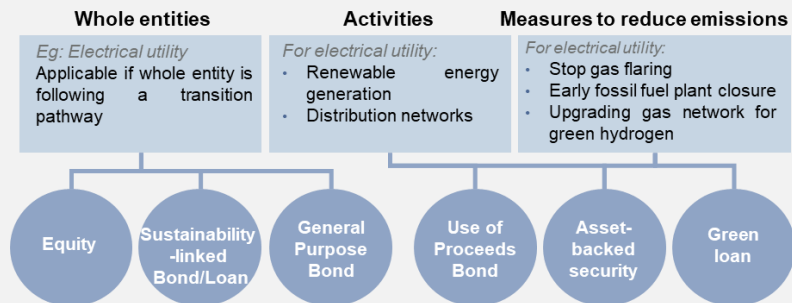
- ✓ Be part of a program to bring the performance of the activity/entity in line with a credible transition pathway
- OR
- ✓ Be recognized individually as making a substantial contribution to climate mitigation
- AND
- ✓ The measures should not lead to a lock-in of GHG intensive assets activities or entities

Source: Climate Bonds Initiatives, “Financing credible transitions” (Sept. 2020)

“Financing Credible Transition” report

Transition creates opportunities for investors, given the range of economy-wide transition actions & the diversity of associated financial instruments.

Application to entity, activity & measures



A need for green and transition labels ?

A distinction between activities that do not have a long-term role to play in a low-carbon economy (due to their high emissions) & those that do (despite their high emissions), providing the foundation of a “transition” label is suggested:

- **Green label** continues to be used for eligible investments in activities/entities that have a long-term role to play and are either already near zero or are following decarbonization pathways in line with halving global emissions by 2030 and reaching net zero by 2050
- **Transition label** for eligible investments that:
 - Either make a substantial contribution to halving global emissions levels by 2030 & reaching net zero by 2050 but will not have a long-term role to play
 - Or will have a long-term role to play, but at present the long-term alignment to net zero goals is not certain.

Source: Climate Bonds Initiatives, “Financing credible transitions” (Sept. 2020)

CBI Survey: summary of stakeholders’ views

The CBI developed a questionnaire for 27 stakeholders interested in the concept of transition bonds, including organizations that had issued labelled bonds.

- There is a broad agreement the concept of ‘transition’ referred to activities that **significantly reduce GHG emissions relative to current practice**, but not enough to comply with the EU taxonomy’s definitions of green.
- Few people appreciated that the EU taxonomy includes thresholds for “pathway to zero” activities.
- The transition label was considered applicable to **hard-to-abate sectors**.
- A minority of stakeholders thought that definitions of transition might vary between **emerging & developed markets** or in regions where renewable energy was not feasible.
- The term ‘sustainability’ should be used for environmental issues extending beyond climate, like circular economy or social issues.
- There were different views about whether the transition label was needed. Opponents were concerned that transition would be used to excuse weak or insufficiently demanding strategies to decarbonize, supporting greenwashing. **Deciding who and how these standards should be set was controversial**.
- There was strong support for any use-of-proceeds transition bond issuance to be accompanied by an enterprise level carbon reduction strategy. To be credible, such a strategy needed short-term KPIs linked to material reductions in emissions and support from (carbon pricing).

Stakeholders	Numbers of interviews
Banks	6
Investors	7
Issuers	7
Policy marker/MDB	2
Think tank	5
Total	27

More details of the survey can be found in the report.

To support the growth of climate transition finance, market practitioners through the ICMA has launched guidelines on the disclosures that should be made by issuers on their climate change strategy when raising funds in debt capital markets.

The concept of “climate transition” focuses principally on the credibility of an issuer’s climate change-related commitments and practices.

To meet the global objectives enshrined within the Paris Agreement on Climate Change to keep global temperature rise this century well below 2 degrees Celsius above pre-industrial levels and to pursue efforts to limit the temperature increase even further to 1.5 degrees Celsius, **significant financing is needed.**

To help facilitate these flows, **clear guidance and common expectations to capital markets participants on the practices, actions and disclosures to be made available when raising funds in debt markets for climate transition-related purposes must be provided for two formats of financial instruments (see on the right):**

Two main fixed-income financing formats

1

Use of Proceeds instruments, defined as those aligned to the Green and Social Bond Principles or Sustainability Bond Guidelines

2

General Corporate Purpose instruments aligned to the Sustainability-Linked Bond Principles

Four key recommendations

1

Issuer's
climate
transition
strategy and
governance

2

Business
model
environmental
materiality

3

Climate
transition
strategy to be
“science-
based”

4

Implementation
transparency

Source: ICMA (Dec 2020), Climate Transition Finance Handbook Guidance for Issuers

1. Issuer's climate transition strategy and governance

1

Issuer's climate transition strategy and governance

A “transition” label applied to a debt financing instrument should serve to communicate the implementation of an issuer's corporate strategy **to transform the business model** in a way which effectively addresses climate-related risks and contributes to the alignment with the goals of the Paris Agreement.

Disclosure

Disclosures regarding corporate strategies may be aligned with recognized reporting frameworks such as the recommendations of the Task Force on Climate-Related Financial Disclosures (TCFD), or similar frameworks. Suggested information and indicators:

- **A long-term target to align with the goals of the Paris Agreement**
- **Relevant interim targets** on the trajectory towards the long-term goal
- Disclosure on the issuer's levers towards decarbonization, and strategic planning towards a long-term target to align with the goals of the Paris Agreement
- **Clear oversight and governance of transition strategy**
- Evidence of a broader sustainability strategy to mitigate relevant environmental and social externalities and contribute to the UN Sustainable Development Goals

Rationale

- Corporate climate change strategies should respond to stakeholder expectations by **purposefully and explicitly seeking to play a positive role in achieving the Paris Agreement**. A range of climate change scenario providers exist in the market today to inform strategy design.
- The choice of the relevant provider, or the decision to design an in-house scenario are up to the issuer. However, regardless of the source, **an issuer's strategy should be guided by the objective of limiting global temperature increases ideally to 1.5°C and, at the very least, to well below 2°C**.

Independent review, assurance and verification

Such a review should include:

- Alignment of both the long-term and short-term targets with the overall scenario
- The credibility of the issuers' strategy to reach the targets

Source: ICMA (Dec 2020), Climate Transition Finance Handbook Guidance for Issuers

2. Business model environmental materiality

2

Business model environmental materiality

The planned climate transition trajectory should be relevant to the **environmentally material parts of the issuer's business model**, taking into account potential future scenarios which may impact on current determinations concerning materiality.

Disclosure

Discussion of the materiality of the planned transition trajectory may be included in the disclosures referenced for Element 1 above.

Rationale

Climate transition financing should be sought by the issuer for **the funding needed in the strategic change over time to its 'core' business activities**.

We note that the climate transition is not the only change faced by companies and that many are involved in various transformations across other business functions. The climate transition trajectory as far as it relates to financing should also be **a material factor to the future success of the business model, as opposed to being an incidental aspect**. The trajectory should also consider the salience of an issuer's climate impacts on the environment and society and seek to mitigate negative externalities.

Independent review, assurance and verification

Externally-provided comfort around materiality considerations may not be appropriate in all cases, however the accounting profession may provide guidance as required.

Source: ICMA (Dec 2020), Climate Transition Finance Handbook Guidance for Issuers

3. Climate transition strategy to be “science-based”

3

Climate transition strategy to be “science-based”

The planned transition trajectory should:

- Be quantitatively measurable (based on a measurement methodology which is consistent over time);
- Be aligned with, benchmarked or otherwise referenced to recognized, science-based trajectories where such trajectories exist;
- Be publicly-disclosed (ideally in mainstream financing filings), include interim milestones, and;
- Be supported by independent assurance or verification.

Rationale

With regards to climate change, authoritative scientific analysis has determined the rate of decarbonization (the ‘decarbonization trajectory’) required in the global economy in order to align the various economic activities with those scenarios which imply a Paris Agreement-aligned level of warming.

Science-based targets are targets that are in line with the scale of reductions required to keep the global temperature increase below 2°C above pre-industrial temperatures.

Disclosure

A number of pre-existing disclosure frameworks exist which issuers may find helpful in preparing to disclose their climate transition plans. It is acknowledged that other similar frameworks may be relevant, and that additional guidance may emerge over time.

Suggested information and indicators:

- Short, medium, and long-term greenhouse gas reduction targets aligned with the Paris Agreement;
- Scenario utilized, and methodology applied (e.g. ACT, SBTi, etc.)
- Greenhouse Gas objectives covering all scopes (Scope 1, 2 and 3)
- Targets formulated both in intensity and absolute terms

Independent review, assurance and verification

A variety of service providers are currently offering independent review services which set out to review a particular issuer’s proposed quantified “decarbonization trajectory” and offer an opinion on the extent to which this is aligned with reference trajectories noted in Element 1 above. Such independent, expert reviews provide prospective investors with an assessment of whether the proposed trajectory is aligned with the science-based trajectories deemed necessary to limit climate change to safe levels

4. Implementation transparency

4

Implementation transparency

Market communication in connection with the offer of a financing instrument which has the aim of funding the issuer's climate transition strategy should also **provide transparency to the extent practicable, of the underlying investment program including capital and operational expenditure.**

Disclosure

Disclosure of capital expenditure (CAPEX) and operational expenditure (OPEX) plans and other relevant financial metrics to the extent they relate to a transition strategy may be made via a company's annual report, website, or sustainability report. Disclosure of anticipated CAPEX and OPEX line items may take the form of a simple table providing detail on specific elements and their connection to the announced strategy, with estimated amounts involved.

Suggested information and indicators:

- Disclosure on the percentage of assets/revenues/expenditures/divestments aligned to the issuer's transition strategy
- Capex roll-out plan consistent with the overall strategy and climate science

Rationale

- It is **the internal allocation of capital by the company in order to implement the strategy** which will be most important, alongside the governance that supports such re-allocation. It is recommended to provide transparency with regards to the **planned capital and operational expenditure decisions** which will deliver the proposed transition strategy.
- Where a transition may have **negative impacts for workers and communities**, issuers should outline how they have incorporated consideration of a **'just transition' into their climate transition strategy** and may also detail any 'social' expenditures that are considered relevant within the context of transition finance.

Independent review, assurance and verification

- Specific assurance or verification of CAPEX and OPEX plans is unlikely to be appropriate given the difficulty in accurately predicting these forward-looking types of expenditures.
- The company may wish to consider providing an analysis of the extent to which outcomes have aligned with original plans, i.e. whether spending took place as anticipated, and in the event it did not, providing explanations as to why.

Source: ICMA (Dec 2020), Climate Transition Finance Handbook Guidance for Issuers

The Sustainable Bond Market (SBM) is a market component within the Debt Capital Market (“Bonds”) segment of the London Stock Exchange Group (LSEG) exclusively listing sustainable finance debt securities. The SBM offers more than 250 bonds, of which many are the world’s first in terms of currency, geography, or structure. It currently lists bonds from 23 countries worth more than £56bn.

The Rationale for Transition Bonds

- **The Transition Bond Segment is a sub-segment within the SBM** alongside the Use-of-Proceeds and General Corporate Purpose segments.
- Highly emitting companies have historically not been able to tap into dedicated / delineated sustainable finance opportunities (i.e., beyond ESG integration or some Indexes).

Emphasizing the transition efforts of high emitting companies through *sui generis/ad hoc* filters, segments or approaches, could help such companies tap into sustainable finance flows for their decarbonization strategies.

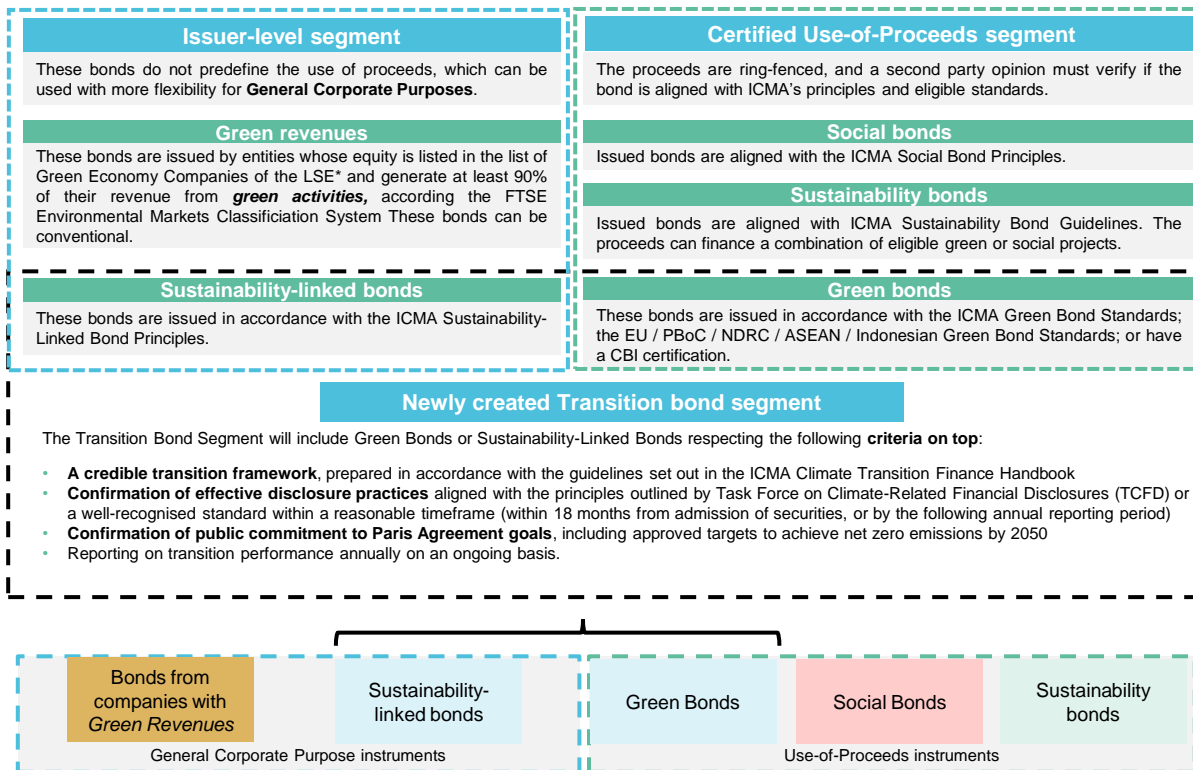
Momentum for these products builds up in the context of:

- A growing interest and appetite of investors towards portfolio transition strategies and transition-labelled products (defensive approach)
- Attracting additional capital from investors poised to be very activist from a climate change mitigation standpoint (offensive approach).

An Overlay for Existing Market Segments

- The bonds issued on **the SBM’s transition bond segment can take two forms**, as Issuers will be able to include both:
 - Use of Proceeds instruments, mainly Green Bonds issued by high emitting companies when these Bonds serve decarbonization purposes
 - General Corporate Purpose instruments aligned with the ICMA’s Sustainability-Linked Bond Principles.
- **The “transition” label of the LSEG can be characterized as an overlay to existing products or a distinctive feature rather than a financial product in itself.**
- An investor can distinguish between the different sustainable debt instruments listed on the LSE and efficiently **single out transition bonds to facilitate the financing of transition efforts of companies in higher-emitting sectors.**

A focus on the LSEG's Transition Bond Segment



4.6 | NATIXIS' GREEN WEIGHTING FACTOR

Steering transition at balance sheet level



What it is:

The Green Weighting Factor is an **internal mechanism** that **links analytical capital allocation to the degree of climate and environmental performance** of each financing.

- It is a tool that **incentivizes the origination of environmentally friendly loans** by weighting on the risk weighted assets linked to the loans
- RWAs being linked to their business profitability, the **originators are encouraged to account for the environmental aspect of each deals**
- In the end, the numbers of **environmentally friendly deals in the bank's balance sheet is bound to increase.**



Its Purpose:

The Green Weighting Factor was designed to **actively manage and steer Natixis CIB origination & balance sheet's transition.**

- **Accelerate the CIB's transition** to Sustainable finance i.e. incentivizing our green business origination (including in carbon intensive sectors)
- **Integrate Climate Transition risk** in the overall assessment of lending transactions , i.e., penalizing deals with negative impact on climate,
- **Monitor the CIB's climate strategy** towards the UN & Paris Agreement goals
- **Be prepared to upcoming regulations** regarding bank's response to climate risk.



Why it matters:

It is a **unique innovation**, fully integrated into the bank's processes and IT system representing an **unprecedented management tool and an asset to further enhance our strategic dialogue with clients.**

The tool is already proving its use cases:

- In our **credit process & lending decision making**
- In our **strategic dialog with clients** and the quality of our sustainable finance products structuring
- In our **commercial strategic planning** : client tiering, priority setting & green / transition opportunity screening
- In our **active balance sheet portfolio management** : distribution, securitization

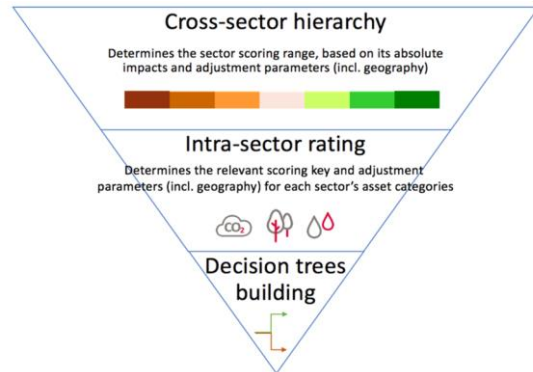
Steering transition at balance sheet level

- Rating methodology using **7-level scale**
- **Climate change centric**, adjusted by **most material environmental externalities**: biodiversity, water, pollution, waste
- **Simple tool**, with no room for interpretation: limited number of criteria, retrievable information, thresholds
- Using a **life-cycle analysis approach** along with established market practices
- **Sectorial approach**: cross-sector hierarchy and cross-asset hierarchy within each sector

DEDICATED PURPOSE FINANCING

Objective: determine the “color” (rating) of each loan **depending on the environmental impact of the object being financed**

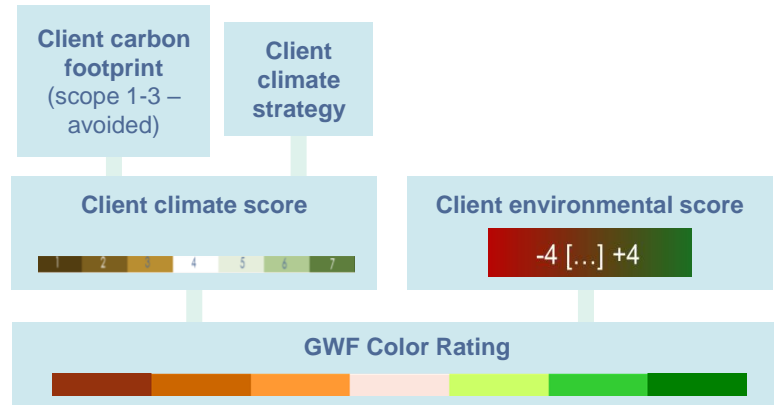
Tool: development **46 different decision trees** for each activity within 8 macro-sectors



GENERAL PURPOSE FINANCING

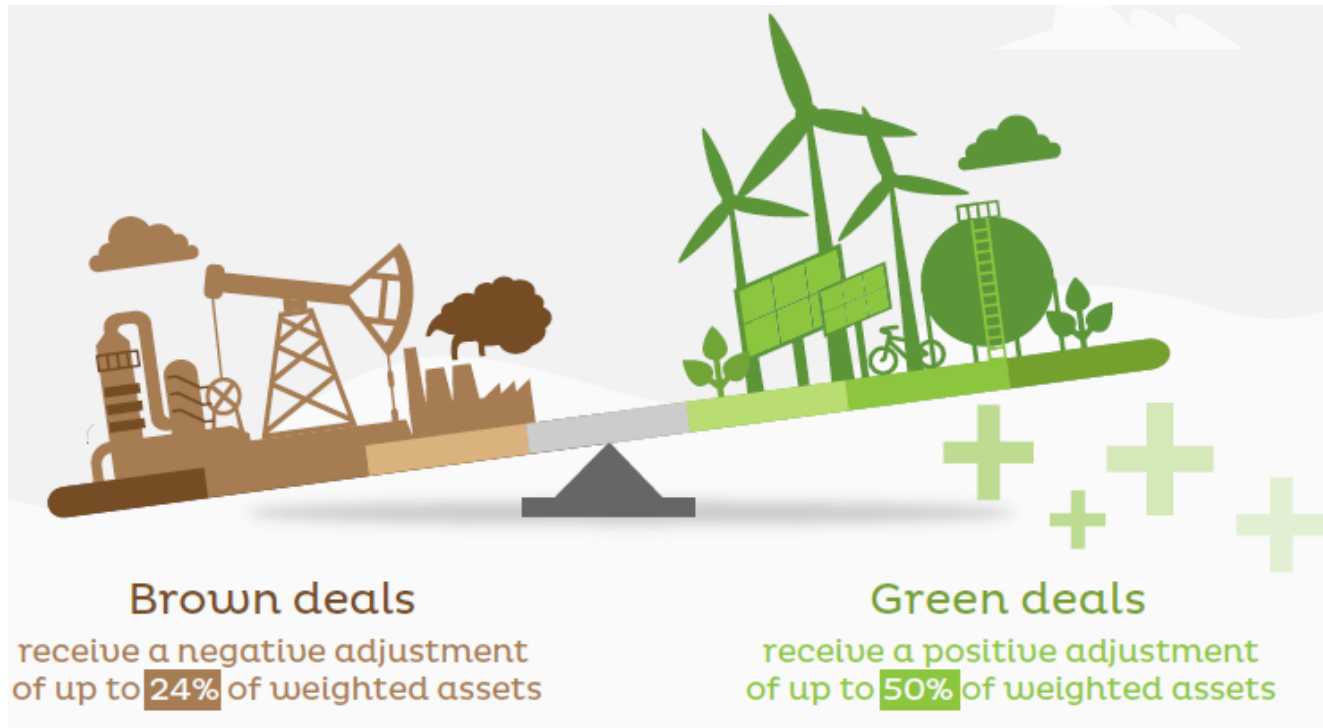
Objective: determine the “color” (rating) of each corporate and public client depending on its **carbon footprint, strategy to decarbonize and impact on most material environmental issue**

- Rating of clients representing 80% corporate exposure



Steering transition at balance sheet level

Scale of risk weighted assets adjustment



Steering transition at balance sheet level

Long term target: align Natixis' balance sheet with the objectives of the Paris Agreement on climate (below +2°C trajectory)

- **Set targets** (short, medium, long term)
 - For Natixis Corporate Investment Bank (CIB)
 - For each business line
- **Actively manage balance sheet's climate impact**

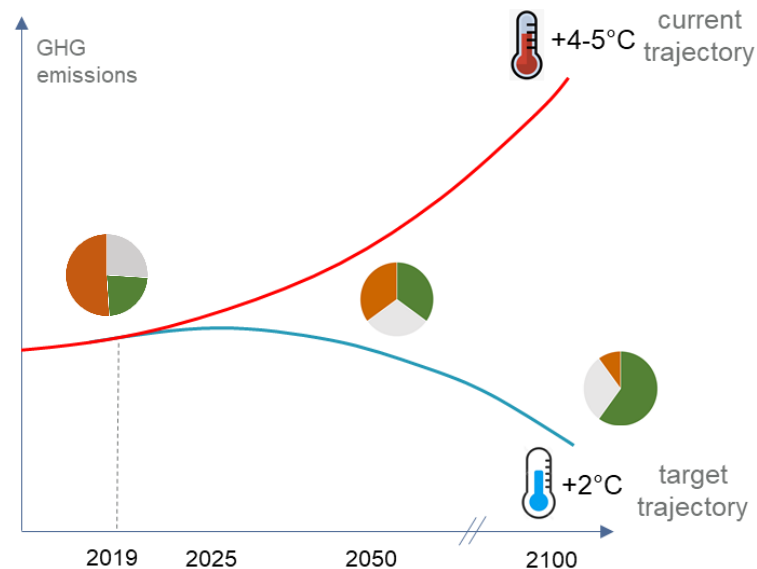
Internal indicators to monitor progress:

- **Green/brown mix of nominal exposure and RWA**
(monitors shift of financing portfolio)
- **Green/brown mix of underwritings**
(monitors shift of financing new origination)
- **EVA indicator**
(used to objectivize origination teams)

Expected frequency of monitoring: quarterly starting Q4 2019

- Transparency: regular disclosure of progress (at least annual)
Indicator expected to be used for external communication:
balance sheet's green/brown mix (nominal exposure & RWA)

FIGURE | Temperature scenarios trajectories



Methodology to translate balance sheet's green/brown mix into climate trajectory is still work in progress

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