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The EU's Revamped Carbon Pricing Policy

Europe has established itself as the global leader in fighting climate change and transforming this process into a driver of growth and competitiveness. The Green Deal, the pillar of the EU's climate and energy policy, rests squarely on the Emissions Trading Scheme (ETS), its main tool for reducing greenhouse gas emissions and putting a price on carbon. Until July 2021, it was the largest (it has just been overtaken by China's own program) but is still the most developed carbon market in the world, and covers about 40% of the bloc's emissions. Since its launch in 2005, it has contributed to decrease about 30% of EU emissions.

In July 2021, the EU unveiled the biggest revamp of the ETS, the *Fit for 55* program, its new 55 percent greenhouse gas reduction target for 2030, amidst a broader package of environmental reforms. It is the first time a major economy radically overhauls

its climate rules, and is being watched worldwide.

Fit for 55 contains three main changes: a rapid decrease in emission levels and the imposition of a likely higher carbon price on industries that have been largely shielded to date, a levy on polluting imports and the inclusion of new sectors: shipping, road transport and energy used in buildings.

The revisions will have a major impact on EU businesses and individuals at all levels, from how people drive, insulate their homes and take their holidays to macro effects on value chains, industry competitiveness and inflation.

We provide an analysis of the ETS, its past and present, and a view of the transformations it will spark. We also provide investment considerations that will help our readers make sense of the changes and spot opportunities where they will emerge.

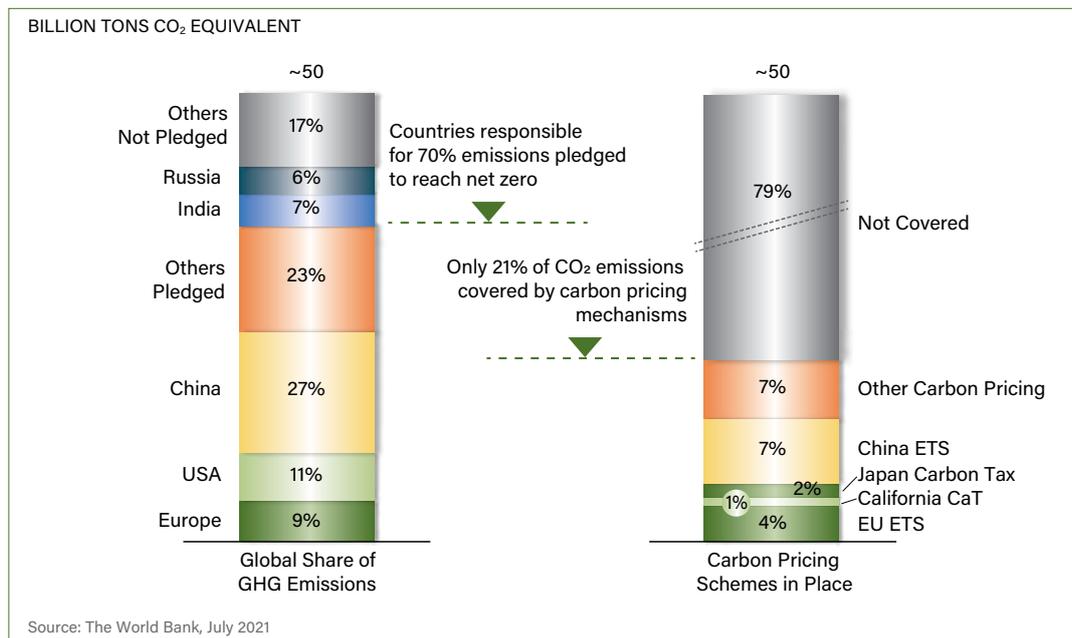


The Case for Carbon Pricing: a Global Challenge

The pressure to intensify climate commitments and reach net zero global greenhouse gas emissions by 2050 is manifest everywhere. So far, more than 70 countries accounting for ~70% of global CO₂ emissions have pledged to become carbon neutral by mid-century, seven times more than in 2018. The pledges, however, have not yet translated into sufficient policies: at the current rate, global emissions would decline only by 1% by 2030. To meet the 2°C Paris goal, the reduction would need to be closer to 25%.

Big polluters need to step up their efforts. China, which produces over a quarter of global emissions, has just launched a carbon policy, which is still in its infancy but is already the world's largest, covering about 7% of global emissions (about a quarter of its 27% share of global emissions). In the U.S., which accounts for 11% of the world's CO₂ emissions, the lack of a federal policy is hardly offset by regional and individual state schemes (i.e. California).

Carbon Pricing Coverage of Global CO₂ Emissions



Carbon pricing policies, where they exist, are at best regional efforts with a territorial reach. The obstacles to harmonizing them are daunting. The above chart describes today's fragmented regional scenario.

Governments, environmentalists and economists, along with increasing numbers of industrialists -including oil and gas executives- agree that carbon must have a higher price if fossil fuels are to stay under ground. Carbon pricing creates incentives for decarbonization by incorporating the cost of greenhouse gas emissions into the price of goods and services. Its effects are pervasive, induce changes in behavior and can create a domino effect across all sectors, from how steel is produced to what we put on our plates for dinner.

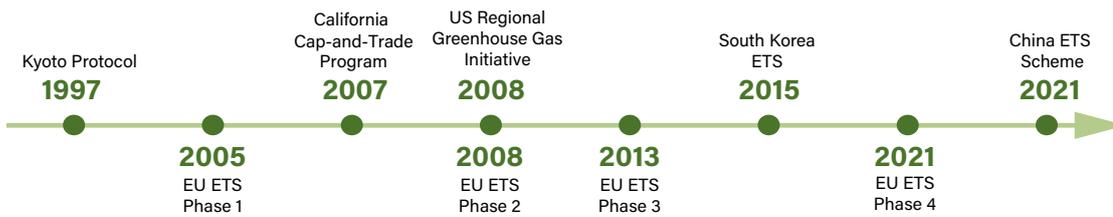
Carbon pricing can be implemented in two ways:

- **A cap-and-trade system** sets a cap on overall emissions. The cap is split into permits, which are given to plants either for free or through auctions. Permits can be traded at a price set by supply and demand. Plants that cut their emissions faster can sell their permits to companies that pollute more. The cap declines over time, gives companies the flexibility to reduce pollution faster, and provides incentives and rewards for innovation in less polluting technology.
- **A carbon tax** puts a price on emissions but does not set emission limits or targets. Since it lacks incentives, it is less market-friendly than a cap-and-trade policy. But it can directly embrace the whole economy and potentially be more effective in driving rapid decarbonization.

The 64 existing carbon pricing schemes worldwide are based on the cap-and-trade model.

“Carbon must have a higher price if fossil fuels are to stay under ground.”

Global Emissions Trading Schemes Timeline



Europe's Emissions Trading Scheme (ETS)

Europe's Emissions Trading Scheme was the first and is the world's most sophisticated and liquid cap-and-trade policy. It was created to generate a pricing mechanism for the right to emit one ton of CO₂ equivalent. It began in 2005 and has since evolved by setting increasingly stringent standards:

- **Phase 1 (2005-2007):** a pilot period used to tweak emissions tracking and reporting. Industrial plants received excess credits to cover emissions at no costs.
- **Phase 2 (2008-2012):** plants were given free credits linked to a cap. Most emissions were covered by free credits, so meeting the cap was easy. Big polluters were forced to buy credits from low emitters to cover the excess, but costs were low.
- **Phase 3 (2013-2020):** electricity production was the first to lose access to free credits, forcing utilities to start paying for all of their carbon emissions. Industrial plants retained the benefit of receiving free credits to cover most of their emissions.
- **Phase 4 (2021-2030):** *Fit for 55* revisions kick in: the emissions cap drops significantly, new sectors are included and industrial plants lose access to free credits in 2026.

How it Works

The ETS covers about 11,000 plants -power-generation facilities and steel, cement, chemicals and fertilizer plants- which generate 40% of EU

emissions. At the beginning of the year, each plant receives a set number of free credits. Additional credits can be bought at periodic auctions or from the secondary market to compensate for actual emissions. About 50% of all credits is allocated for free, but unevenly across industries. In March of the following year, when a plant surrenders credits to pay for emissions, it can incur a surplus or a deficit. Excess credits can be stored in the books for future needs or sold on the market. In case of a deficit, a 100€ per ton penalty is imposed in addition to the cost of the credit. Unpaid penalties add up annually and can create a spiral of debt.

The ETS at Work: Polluters Pay the Highest Price

The ETS carbon price makes generating electricity more or less profitable, depending on how much CO₂ is produced. The lower the CO₂ emissions, the lower the carbon cost, and the higher the profitability. One MWh of electricity made with coal emits 1 ton of CO₂ but only produces 0.4 tons of CO₂ with natural gas, and is entirely carbon free if it comes from a wind farm.

At the current CO₂ price of about 50€ per ton, a coal plant is charged a carbon cost of about 50€ per MWh, which drops to 20€ per MWh for a gas plant. A wind farm pays nothing. Considering that the one year forward wholesale electricity price is about 70€ per MWh, CO₂ prices can represent a crippling -or small- percentage of the cost structure. And that's precisely the point of the ETS pricing scheme.

ETS: Efficiencies and Distorsions

The ETS generally makes it more expensive to pollute across industries and sectors. Its effect on utilities and electricity-generation is a case in point: electricity-generation is the only sector that pays the full price of CO₂ because it does not receive free carbon credits. As a result, carbon pricing has accelerated investments in renewable-powered energy infrastructure. It is no wonder that Europe is home to the world's biggest renewable energy producers: Enel, the largest worldwide; Orsted, which runs a quarter of the wind farms globally;



Iberdrola, on course to triple its renewable energy capacity and become carbon neutral by 2030.

“The ETS generally makes it more expensive to pollute ... but has created distortions which have often been overlooked.”

But the ETS has also created distortions, which often have been overlooked. Gasoline for cars, gas for households and kerosene for air transportation are excluded from the ETS, as is CO₂ embedded in imports from countries where it is not priced. The result is that carbon-heavy sources of emissions have benefited from loopholes and remained more competitive against more environmentally-friendly alternatives like electric vehicles or heat pumps.

▪ **Efficiencies:**

Electricity Generation: power plants have taken the full hit of the ETS pricing mechanism and this is obviously reflected in higher electricity prices. Utilities represent 60% of all ETS demand. The average CO₂ intensity of the European grid is currently 0.25 tons of CO₂ for every MWh of electricity generated. At today's CO₂ price of about 50€ per ton, the average European household pays approximately 13€ for CO₂ in its overall average electricity bill of 210€ per MWh. At the current rate of decarbonization of electricity in the EU, average CO₂ intensity will fall below 0.1 tons of CO₂ per MWh by 2030, making the impact of CO₂ 25% less expensive, even if the carbon price doubles to 100€ per ton.

▪ **Distortions:**

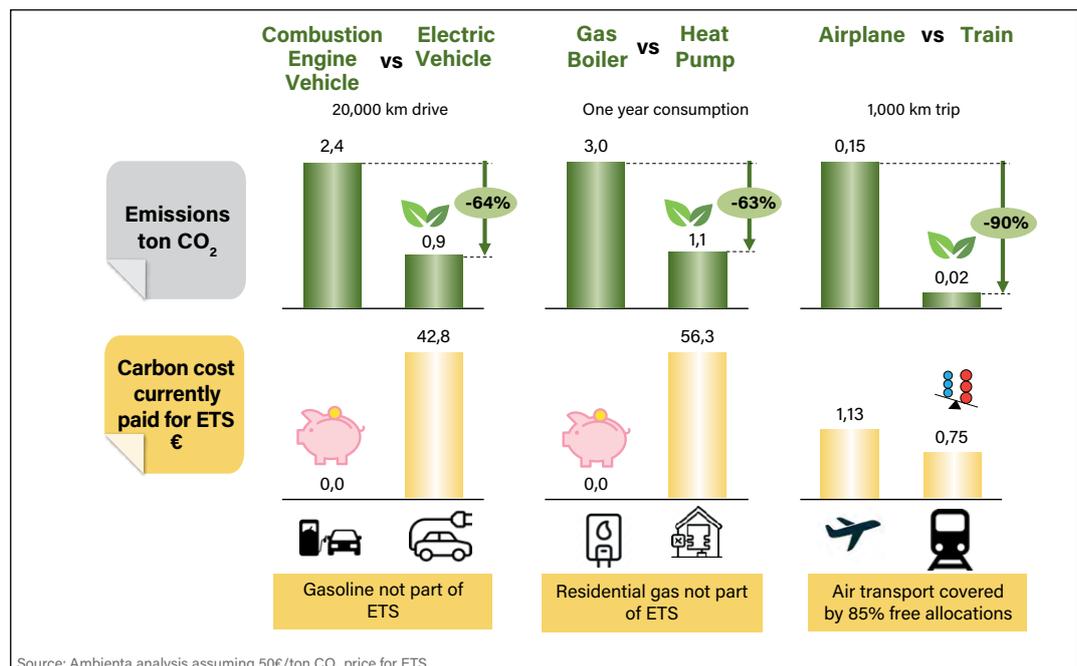
Loopholes: the list of ETS loopholes is considerable but not obvious. Gasoline is exempt from

the ETS (although it is heavily taxed throughout Europe), making internal combustion engines more competitive against electric vehicles, which emit three times less CO₂. Natural gas used to heat boilers is also excluded (fuels fall under the ETS only if they are burnt in industrial plants above 20MW capacity), so gas boilers are favored against electric heat pumps, which are four times more efficient. Air transportation, the most polluting mode of travel, is charged the same carbon price as an electric train, which pollutes 10 times less. The list goes on with cement versus wood in construction, steel made from iron ore versus recycled raw materials, etc.

Carbon Leakage: industrial plants producing CO₂-heavy products (steel, cement, etc.) included in the ETS face much more international competition from imports from outside Europe than power plants. In these cases, the ETS carbon credit cost can create an economic disadvantage for EU businesses compared to foreign countries with laxer emissions constraints and lead them to relocate production abroad. The ultimate reduction of the emissions goal would then fail and simultaneously create an employment loss. Because of these considerations, until now 97% of industrial plants have received a large amount of free credits, shielding them from competition. Indeed, half of the total 1.5 billion tons of ETS credits have not been auctioned but awarded for free, mostly to industrial plants.

The bulk of these challenges has been redressed with the *Fit for 55* revisions.

ETS Market Distortions Hurt some Electrification Applications





THE NET ZERO AMBITION: THE ASSET MANAGER PERSPECTIVE

Asset managers have embraced the need to reduce carbon emissions. Many are decarbonizing their own operations while others, especially smaller ones like Ambienta, have already reached the target of net zero through carbon offsets.

Decarbonizing investments and assets has also gained momentum in recent years. Large institutions have pledged to decarbonize their portfolios and reach net zero by 2050. The Net Zero Asset Managers

Initiative is an industry initiative in this direction which includes giants like BlackRock, Fidelity and HSBC.

But implicit risks and limits exist. The easiest and fastest way to achieve decarbonization is to divest from carbon-intensive industries where high capital investment requirements drive lower returns over longer time periods. Finding the way to harmonize divestments with the primary objective of maximizing returns will be the biggest challenge facing asset managers going forward. Plus, simply divesting can help reach individual objectives but might fail to drive collective decarbonization across multiple sectors.

Institutional investor groups, such as the IIGCC (the Institutional Investors Group on Climate Change), are critical to foster awareness, educate and promote industry-wide engagement in a common goal that will benefit all stakeholders and protect citizens. The IIGCC, after extensive work in other asset classes including listed equities, fixed income, real estate and infrastructure, has now launched a working group co-led by Ambienta and Capital Dynamics with the aim to develop guidance for investors on aligning Private Equity investing with net zero ambitions.

Fit For 55: Key Changes and What they Mean for Investors

Below we describe *Fit for 55's* three key reforms impacting the ETS and their macro effects on the overall economy. We also present our investment considerations based on Ambienta's deeply-rooted understanding of sustainable investments.

Acceleration of the Linear Reduction Factor: the EU has set a higher decarbonization target for ETS emissions to be met by 2030: -55% vs -40% previously. To achieve this, total credits allocated will decline at an increased annual pace, which differs by sector. The reduced emissions cap will inevitably drive prices up and reinforce incentives to decarbonize.

- **Investment Considerations: Electricity:** the electricity value chain will benefit from a decade-long investment cycle since it represents a lower emissions energy vector. This will yield higher electricity demand as applications shift to electricity (electric vehicles, heat pumps, etc.). Players well-positioned to improve grid capacity (including intermittent energy from renewables), distribution efficiency and resiliency will have a real competitive advantage. Higher carbon prices will provide a strong tailwind for renewable energy investments and cripple those that are carbon-intensive.

Enel plans to triple electricity infrastructure in-

vestments to reach homes equipped with electric vehicles and heat pumps, and to make it more resilient in view of the myriad new uses of electricity. In Spain alone, electric vehicles and residential heat pumps will boost electricity demand by 12% by 2030.

Ambienta has been tracking electrification's crucial role in driving decarbonization for years. Our 2018 Sustainability Lens *The Electricity Transition: 10 years into the Game and Much More To Come* is an example of our analysis and foresight.

The Carbon Border Adjustment Mechanism (CBAM): this carbon frontier tax aims to address the carbon leakage distortions by creating a level playing field with respect to competition from imported goods which are not required to pay a carbon credit. Imported goods included in the list, such as steel products, will be charged a carbon tax as of 2026. In parallel, in order not to duplicate positive incentives for EU businesses, free credit allowances will have to decline and are planned to reach zero by 2035. This will increasingly require EU businesses either to pay for their emissions or to decarbonize. Since this very complex mechanism cuts through international trade regulations, many details (emissions reporting standards, benchmark levels, etc.) still need to be set. The potential impact on the steel industry is explained below.



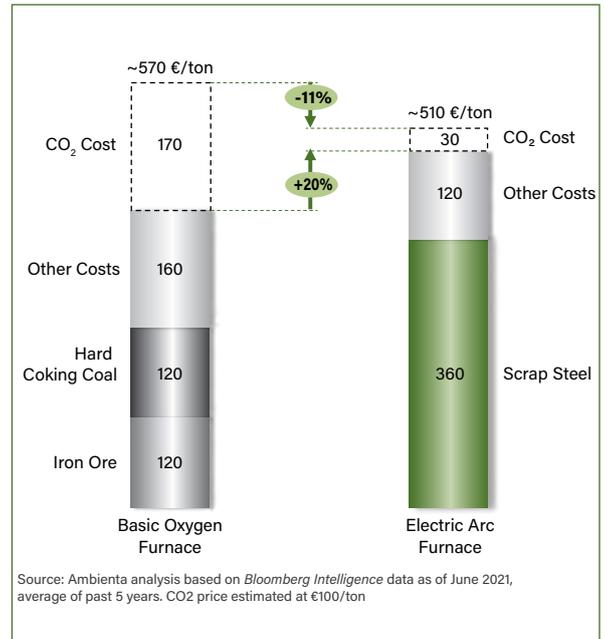


Coking Coal Mine for a Blast Furnace



Metal Scrap for an Electric Arc Furnace

Impact of ETS on Steel Manufacturing Cost Structure



▪ **Investment Considerations: Steel:** steel accounts for 5% of global CO₂ emissions and is one of the single most polluting industries worldwide. Two main processes exist to make steel: primary steel production, or Basic Oxygen Furnace (BOF), and Electric Arc Furnace (EAF). BOF involves melting basic iron ore and carbon coke into a blast furnace, which emits about 2 tons of CO₂ per ton of steel produced. The economies of scale generated by larger plants and the ability to rely on basic commodities are big advantages. The EAF uses electricity to melt scrap steel or very pure iron ore, and produces new steel. While BOF plants can be built on a large scale, EAF plants can operate intermittently and emit up to 80% less CO₂ per ton of steel.

The largest six players produce 50% of EU steel. They also account for 80% of European BOF production. Smaller players, such as Italy's Danieli, are leaders in clean steelmaking and represent about 85% of all Europe's EAF capacity.

Over the past few years, low raw materials prices and high scrap steel prices have favored BOF producers. But the CBAM, which will cause free credits for sectors like steel to cease, will make carbon-intensive steel far more expensive while creating sustainable competitive advantages for greener plants. The following chart shows this effect on steel manufacturing costs.

Addition of Three New Sectors: maritime and road transportation (5% and 21% of EU emissions respectively) and building energy combustion (12% of EU emissions) have been added to the ETS. They expand the ETS' reach to cover 80% of the bloc's

emissions and bring all sectors in line with the EU's overall decarbonization targets. The maritime sector will join in 2023; the others will initially form a separate ETS market in 2026 and will be included after 2030.

▪ **Investment Considerations: Maritime Transportation:** this is expected to have limited effects on the shipping market and on final consumers. Less than 15% of global shipping emissions originate from trips within or to-from the European Economic Area (EEA). Maritime shipping is by nature a global activity, with most players covering routes across all continents. Hence, EU travel will impact shipping companies' cost structure minimally.

In shipping containers, 10 players hold 85% of global container capacity and have vastly diversified networks. Not only will the ETS affect a limited share of their activities; it will also encourage them to re-design their routes to minimize the length of the last leg of the trip ending in European ports (only the portion ending in a member state will be subject to ETS permits).

Considering freight rates over the past 2 years -spot rates have increased four-fold in this period- a carbon tax will inevitably be passed on from carriers to shippers. Effectively, it will only represent an artificial increase of the bunker cost, boosting fuel efficiency and making low-carbon alternatives more competitive, but with little effect on the industry's competitive scenario.

Even if all global shipping emissions were factored in, a carbon pricing scheme would only add

5-10% to the overall shipping cost at current CO₂ prices, which is only a fraction of the final price of products.

Overall Macro Effects

While the extent of *Fit for 55's* effects on industries, value chains and the overall economy will be under close scrutiny in coming months, carbon credits clearly emerge as a key factor in investment cases beyond electricity production, for three reasons:

- **Cost Structures:** high carbon prices become a crucial component of variable costs as they are factored into manufacturing. Cleaner processes will be more competitive than polluting ones. Heavy industries where production processes can be more or less polluting - like cement, steel and aluminum- will become polarized into winners and losers.
- **Inflation:** the ETS can become a driver of inflation. Carbon-intensive supply chains will try to pass higher product costs on to clients who, at least initially, might suffer from higher prices. As always, inflation might be viewed negatively by end-users. Nonetheless, since the CBAM is expected to protect the EU economy from unfair external competition, this could benefit internal

production and help it develop thanks to the positive effects on employment and salaries, which have struggled for decades in continental Europe. Uncontrolled inflation is bad for the economy, but a bit of it helps. In the meanwhile, this "inflation of polluting goods" will improve investment cases for the circular economy and light carbon products, such as recycled plastics and wood, and their relative value chains.

- **Delocalization:** the CBAM should favor cleaner European manufacturers and offset incentives to delocalize plants outside the EU as the cost of emissions rises and demand for cleaner goods grows.

Cement: A Case in Point: one ton of environmentally-friendly cement emits 0.5 tons of CO₂ vs. 0.8 tons for its polluting counterpart. The difference costs a polluting producer 6€ per ton if the carbon price is 20€ per ton, but jumps to 30€ if carbon is priced at 100€ per ton. Even clean cement might be burdened with price hikes of up to 40%, at least initially. To fully appreciate the big impact of CO₂ prices on cost structures, just consider that the current German wholesale cement price is 90€ per ton.

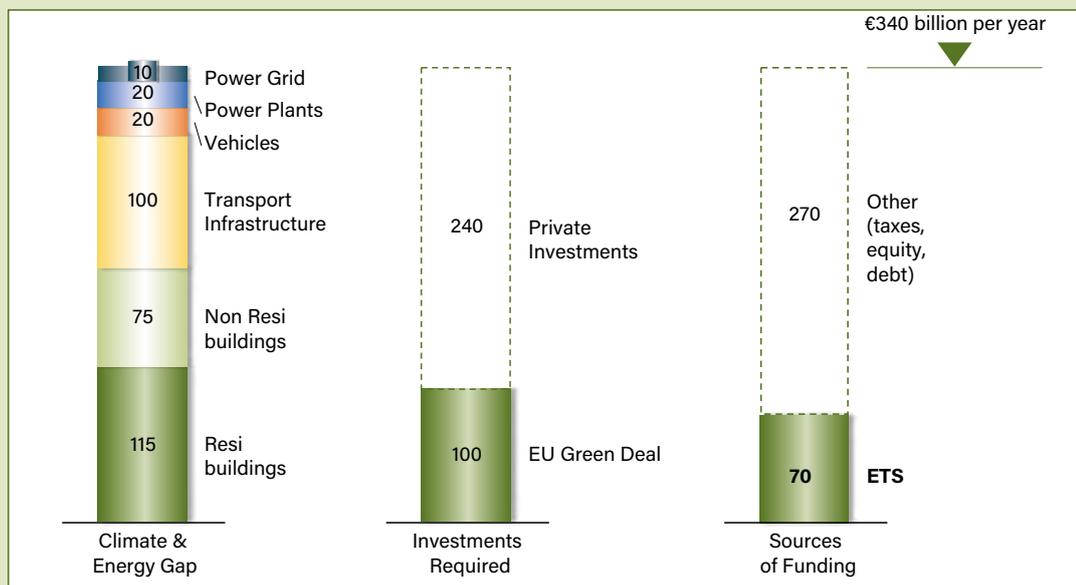
“Carbon-intensive supply chains will pass higher production costs on to clients.”

How the ETS Can Fund the EU's Green Deal

In 2020, the ETS disposed of 1.5 billion CO₂ credits; about 780 million were auctioned and the rest were provided for free. At an average price of €25 per credit, the EU collected €20 billion.

Fit For 55 will generously fund the EU's coffers as it increasingly raises the CO₂ price and auctions more credits. By 2030, free credits will drop to 20% from 2021 levels. At a realistic price of 100€/credit, auctioning about 700 million credits will provide the EU 70€ billion in 2030 alone - a financial bonanza that can help fund the Green Deal, a 1€ trillion investment over the next 10 years, or 100€ billion a year (see *Ambienta Sustainability Lens The Impact of the Green Deal and Recovery Fund on Sustainability Investments in Europe*, August 2020).

The ETS and the EU's Green Deal



Source: Ambienta analysis based on the EC's Commission Staff Working Document, *Identifying Europe's Recovery Needs*



Conclusion

The ambitious *Fit for 55* revisions unveiled in July 2021 plan to cut emissions of greenhouse gases by 55% by 2030 compared to 1990 levels by implementing a series of profound transformations. Although they are still only proposals and may take years to negotiate, they have set the stage for the course ahead: there is no turning back from climate change policies.

Existing carbon pricing schemes, even if far from perfect and with restricted regional reach, are the way forward. Many more national and international such programs need to be implemented quickly to create the necessary incentives for companies and individuals to pursue the targets that will help

mitigate climate change. China's step is one of them.

The lesson for investors is clear: CO₂ emissions will be increasingly penalized at incrementally higher prices, and will be incorporated into the price of goods and services. This simple truth will create winners and losers, transform and polarize industries and spark selective inflation.

Ambienta's experience in sustainable investments and its hands-on understanding of how to spot and measure opportunities in sectors affected by resource efficiency and pollution control makes it a trusted partner in this uncertain scenario.

