

THE PRICE OF CARBON, THE ONLY REAL QUESTION

POLICY PAPER

ABOUT

Aristote is the brand name of a recently created advisory activity I launched to help corporates and financial institutions to deal with all regulations related to the so called "Sustainable Finance" EU strategy, especially in the fields of risk management, disclosures and taxonomy.

In this area, one of the main challenges for companies is to be able to improve the communication of information on non-financial risks and opportunities, by linking them clearly with their strategy. This implies adopting new developments, innovations and good practices in terms of information data and communication, both at European and international level.

In parallel to this advisory activity, I teach the economics of climate change in the "International Affairs & Development" Master's Degree of Dauphine-PSL University, where I teach Finance since 1992. The course aims to explain global warming, biodiversity, the disappearance and depletion of resources, consequent public policies, and the impacts this should have on corporate and financial institutions business models in a microeconomics perspective.

Based on this background, I believe to be in a position to provide a legitimate and experienced-based contribution to the Commission's work on the "Renewed Sustainable Finance" project.¹

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July 6, 2020



¹ After an exchange with the Joint Transparency Register Secretariat (JTRS), as Aristote (i) doesn't represent any clients on behalf of whom it is interacting with the EU institutions, and (ii) has no eligible "own activities", it is not subject to a registration in the EU Transparency Register.

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EXECUTIVE SUMMARY

As the EU moves towards climate-neutrality and steps up the fight against environmental degradation, the financial and industrial sectors will have to undergo a large-scale transformation, requiring massive investment.

Finance has an undeniable role in this transition as it is the provider of means for the necessary shift to materialize.

Yet the financial system as a whole is not yet transitioning fast enough. Substantial progress still needs to be made to ensure that the financial sector genuinely supports businesses on their transition path towards sustainability, as well as further supporting businesses that are already sustainable.

For these reasons, the European Green Deal announced a Renewed Sustainable Finance Strategy.

Albert Einstein once said, *“If I were given one hour to save the planet, I would spend 59 minutes defining the problem and one minute resolving it.”* While that may sound extreme, it does highlight the importance of defining problems.

Actually, financial flows will always follow projects and investments that have a potential of rentability and feasibility. Therefore, it is necessary that low greenhouse gas emissions and climate-resilient projects become attractive compared to high-emissions activities.

This means that the structure of profitability must change for financial flows to fully reorient towards sustainable initiative.

This implies to give a price to the negative externality caused by economic activities issuing Greenhouse Gas (GHG).

The work of the main climate economists (Nordhaus, Tirole, Weitzman, etc.) tells us the same story: credible and increasing constraints are needed on the quantities of CO₂ and on the price of CO₂. Almost all academic economists support such a solution.

Carbon prices are intended to incentivize the changes needed in investment, production, and consumption patterns, and to induce the kind of technological progress that can bring down future abatement costs.

European Union should definitely take the lead at a global level on this question of carbon pricing, leveraging on the many “cap and trade” or carbon tax initiatives implemented, scheduled for implementation or under consideration in the world.

At EU level, a well-designed carbon pricing policy should then:

- Give to an independent authority, kind of “*EU Carbon Central Bank*”, the task to define the trajectory of carbon price that is consistent with the objective of carbon neutrality in 2050.
- Within the Common Market, reform the ETS system in order to raise its prices and reduce its volatility and leave the Member States free to choose their method of imposing a single carbon price by a mix of ETS, a reinforced national version of the ETS and carbon tax. The common point of the various systems should be (i) the pre-defined price trajectory, and (ii) a full coverage of the goods and services consumed
- Implement an adjustment at the borders (taxation of imports, subsidies for exports) making possible to send the very same price signal to all the goods and services consumed in the Union, so that to address the problem of “*carbon leakage*”, and to level the competition conditions between the Union and its trading partners.

The proceeds of the carbon ETS and tax should then return to the private sector (corporates and households) or be used in precisely targeted environmental projects, leaving the choice of methods of redistribution to the national level.

A high and increasing carbon price over time may not be enough to achieve the targets, but without the powerful incentive it offers, any cocktail of regulatory measures and capital expenditure will fail.

INTRODUCTION

According to the Intergovernmental Panel on Climate Change (IPCC), concentrations of greenhouse gas (GHG) in the atmosphere are unprecedented in at least 800 000 years, and this is extremely likely to have been the dominant cause of the observed warming since the mid-20th century. *“Human activities are estimated to have caused approximately 1.0°C of global warming above pre-industrial levels ... global warming is likely to reach 1.5°C between 2030 and 2052 if it continues to increase at the current rate”*²

This will cause long-lasting changes in all components of the climate system, increasing the likelihood of severe, pervasive, and irreversible impacts for people and ecosystems. Extreme weather events impact health and damage infrastructure and private property, reducing wealth and decreasing productivity.

These events will (and already do) disrupt economic activity and trade, creating resource shortages and diverting capital from more productive uses to reconstruction and replacement. Uncertainty about future losses could also lead to higher precautionary savings and lower investment.

Albert Einstein once said, *“If I were given one hour to save the planet, I would spend 59 minutes defining the problem and one minute resolving it.”* While that may sound extreme, it does highlight the importance of defining the problems first.

Financial flows will always follow projects and investments that have a potential of rentability and feasibility. Therefore, it is necessary that low greenhouse gas emissions and climate-resilient projects become attractive compared to high-emissions activities. This means that the structure of profitability must change for financial flows to fully reorient towards sustainable initiative.

We face here the classical question of the tragedy of the commons, a situation in a shared-resource system where individual users, acting independently according to their own self-interest, behave contrary to the common good of all users by depleting or spoiling the shared resource through their collective action.

The theory originated in an essay written in 1833 by the British economist William Forster Lloyd, who used a hypothetical example of the effects of unregulated grazing on common land (also known as a *“common”*) in Great Britain and Ireland.

The concept became widely known as the *“tragedy of the commons”* over a century later due to an article written by American biologist and philosopher

² <https://www.ipcc.ch/reports/>

Garrett Hardin in 1968.³ In this modern economic context, "commons" is taken to mean any shared and unregulated resource such as atmosphere, oceans, rivers, ocean fish stocks. The concept was revisited by Mark Carney in the famous *"breaking the tragedy of the horizon"* speech⁴ he delivered at the Lloyds City Dinner on September 29, 2015.

This means that the necessary transition to a sustainable economy implies to give a price to the negative externality caused by economic activities issuing Greenhouse Gas (GHG).

European Union should definitely take the lead at a global level on this question of carbon pricing, leveraging on the many "cap and trade" or carbon tax initiatives implemented, scheduled for implementation or under consideration in the world.

The purpose of this paper is to clarify, in link with the Renewed Sustainable Finance consultation, how this could be done.

³ <http://science.sciencemag.org/content/sci/162/3859/1243.full.pdf>

⁴ <https://www.bis.org/review/r151009a.pdf>

I. A PRICE FOR CARBON

There are two methods for calculating the price of carbon:

The first is based on the polluter pays principle. The price of a tonne of CO₂ must correspond to the cost of the damage it generates. The job of economists here is to assess this cost, with a difficulty, which is that most of this damage will occur in decades.

The other method is based on a political objective, for example limiting global warming to 2 degrees. Then, you define a "carbon budget", evaluating what each tonne saved will cost to reach this objective.

It was during the 22nd Conference of the Parties (COP 22) of the United Nations Framework Convention on Climate Change (UNFCCC) held in Marrakech, Morocco, in 2016. At the invitation of the Co-Chairs of the Carbon Pricing Leadership Coalition (CPLC) High Level Assembly (Ségolène Royal and Feike Sijbesma), Joseph Stiglitz, Nobel Laureate in Economics, and Lord Nicholas Stern, accepted to chair a new High-Level Commission on Carbon Prices comprising economists, and climate change and energy specialists from all over the world, to help spur successful implementation of the Paris Agreement.

The Commission's objective was *to identify indicative corridors of carbon prices that can be used to guide the design of carbon-pricing instruments and other climate policies, regulations, and measures to incentivize bold climate action and stimulate learning and innovation to deliver on the ambition of the Paris Agreement and support the achievement of the Sustainable Development Goals.*

The idea was clearly to explore explicit carbon-pricing options and levels that would induce the change in behaviors, particularly in those driving the investments in infrastructure, technology, and equipment, *needed to deliver on the temperature objective of the Paris Agreement, in a way that fosters economic growth and development, as expressed in the Sustainable Development Goals (SDGs).*

The *High-Level Commission on Carbon Prices* published its final report⁵ on May 29, 2017, concluding that the explicit carbon-price level consistent with achieving the Paris temperature target was at least US\$40–80/tCO₂ by 2020 and US\$50–100/tCO₂ by 2030, provided a supportive policy environment is in place.

In France, built more or less with the same logic, a report published more recently (February 2019) by France Strategies, a think tank attached to the

⁵

https://static1.squarespace.com/static/54ff9c5ce4b0a53decccfb4c/t/59b7f2409f8dce5316811916/1505227332748/CarbonPricing_FullReport.pdf

Prime Minister, suggested a carbon price of 90 euros per tonne in 2020, then increasing it to 775 euros in 2050.

Having said that, they are three main possible mechanisms to “internalize” carbon price Finance will only play its role of capital orientation if those prices are fully internalized, with:

- On the one hand, a system of emission quotas, like the one that the European Union has established for part of its economic activities. At global level, a market for quotas to be polluted has also been set up under the Kyoto protocol, but with numerous exemptions. Such a system has the particular advantage of allowing financial transfers between countries to the advantage of those who emit little CO₂.
- The other mechanism is based on a tax and it is the choice made by 25 states or regions in the world, such as France or Sweden. In an unprecedented scale petition⁶ published in January 2019 by the Wall Street Journal, more than 3,500 American economists, including 4 former Chairs of the Federal Reserve, 15 former Chairs of the Council of Economic Advisers, 27 Nobel laureates, called for the United States to implement a carbon tax at the national level, *“expected to increase each year until the emission reduction targets are reached,”*.
- Finally, a downgraded solution can be to integrate implicit carbon pricing into financial instruments and incentives that foster low-carbon programs and projects. Taxonomy, if properly used to put a polluter-pays principle in place could also be used this way.

II. THE GLOBAL DYNAMICS OF CARBON PRICING

1. A dynamic landscape

The World Bank published on May 2020 its yearly report “States and Trends of Carbon Pricing Report”⁷.

According to this report, carbon pricing initiatives are expanding across national and state lines, with increased cooperation among jurisdictions to align their carbon markets.

- In Europe, the Swiss and the EU Emissions Trading Systems (ETS) became linked on January 1, 2020, allowing covered entities in the Swiss ETS to be able to use allowances from the EU ETS for compliance, and vice versa.

⁶ <https://clcouncil.org/economists-statement/>

⁷ <https://openknowledge.worldbank.org/bitstream/handle/10986/33809/9781464815867.pdf?sequence=4>

- Following its departure from the EU and ultimately the EU ETS, the UK is considering implementing its own ETS and linking it to the EU ETS.
- Germany, Austria, and Luxembourg are planning carbon pricing for sectors not included in the European Union Emissions Trading System (EU ETS), and the EU's Green Deal with its commitment to reach carbon neutrality by 2050, has strengthened the case for wider coverage of carbon pricing.⁸
- Similarly, in the US, the Regional Greenhouse Gas Initiative (RGGI), a collection of Northeastern states with a regional carbon market for the power sector, has expanded to include New Jersey and Virginia. Pennsylvania is interested in joining RGGI, and its inclusion would significantly increase the size of the carbon market and bring a major fossil fuel state into the initiative. Similarly, a group of ten Northeastern states in the US is moving forward with a cap-and-invest program for its transport sector.

There are now 61 carbon pricing initiatives in place or scheduled for implementation, consisting of 31 ETSs and 30 carbon taxes, covering 12 gigatons of carbon dioxide equivalent (GtCO₂equ) or about 22 % of global GHG emissions.

This is an increase compared to 2019, in which 20 % of global GHG emissions were covered by ETSs and carbon taxes that were implemented or scheduled for implementation.

Nevertheless, according to the *High-Level Commission on Carbon Prices*, 85% of global emissions are not priced, and about three quarters of the emissions that are covered by a carbon price are priced below US\$10/tCO₂.

The 2019 figure given by the World Bank, are slightly different: less than 5 percent of GHG emissions covered by a carbon price are within the range defined by the *High-Level Commission on Carbon Prices* with about half of covered emissions priced at less than US\$10/tCO₂equ. The IMF calculates the global average carbon price is only US\$2/tCO₂.⁹

This statement is consistent with the observation that the Nationally Determined Contributions (NDCs) for 2030 associated with the Paris Agreement represent emission reductions that are substantially smaller than those necessary for achieving the Paris target of “well below 2°C.”

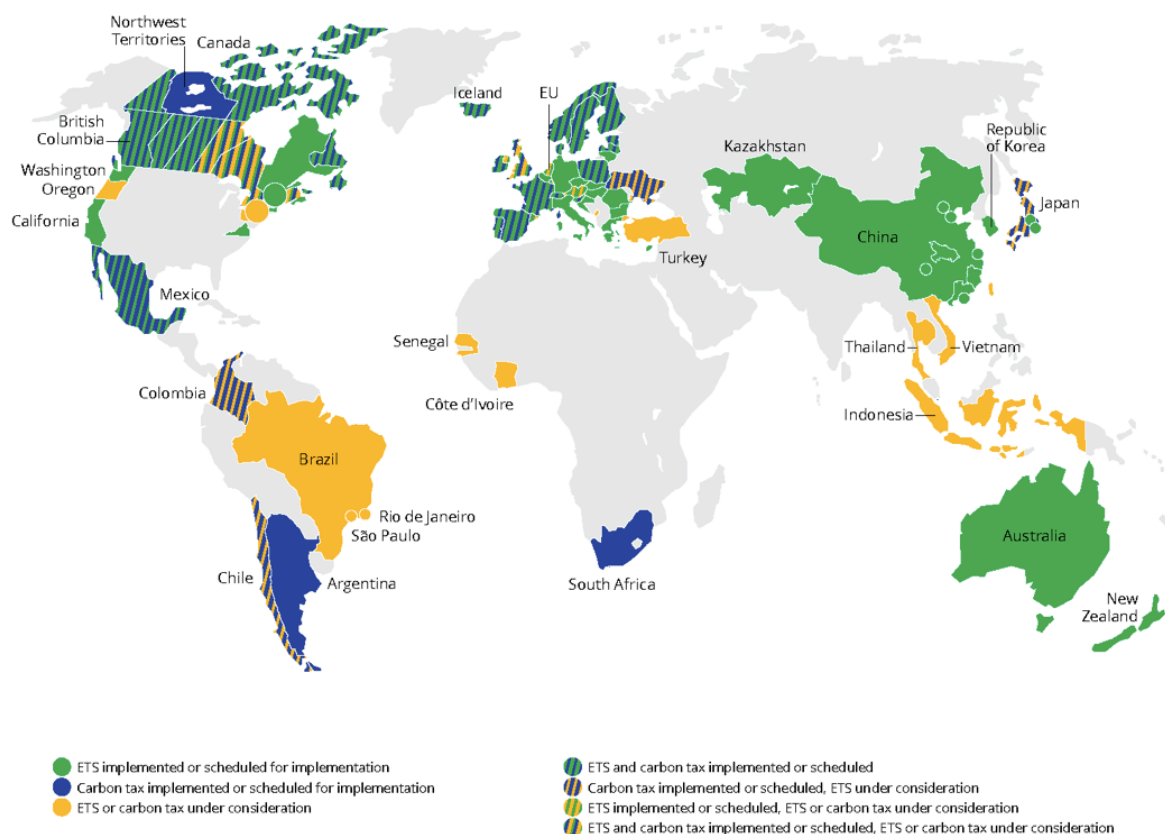
Governments raised more than \$45 billion from carbon pricing in 2019. 2019 saw a slower yearly increase in revenues than 2018 (US\$1 billion compared to US\$11 billion) largely as a consequence of the EU ETS price stabilization in 2019.

⁸ <https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1588580774040&uri=CELEX%3A52019DC0640>

⁹ Source: IMF, Putting a Price on Pollution, Finance & Development 56(4), December, 2019.

Almost half of the revenues were dedicated to environmental or broader development projects, and more than 40 percent went to the general budget. The remaining share was dedicated to tax cuts and direct transfers.

The landscape then is as follows (source : State and Trends of Carbon Pricing, World Bank Group, 2020)¹⁰:



In this context, European Union should definitely take the lead at a global level on this question of carbon pricing, leveraging on the many ETS or carbon tax initiatives implemented, scheduled for implementation or under consideration in the world.

A well-designed carbon pricing policy should be at the heart of a strategy for reducing emissions in an efficient way. Carbon prices are intended to incentivize the changes needed in investment, production, and consumption patterns, and to induce the kind of technological progress that can bring down future abatement costs.

2. The EU Green Deal approach

¹⁰ <https://openknowledge.worldbank.org/bitstream/handle/10986/33809/9781464815867.pdf?sequence=4>

In its communication dated December 11, 2019, about the Green Deal¹¹, the European Commission announced various important initiatives in that field.

By summer 2020, the Commission will present an impact assessed plan to increase the EU's greenhouse gas emission reductions target for 2030 to at least 50% and towards 55% compared with 1990 levels in a responsible way. To deliver these additional greenhouse gas emissions reductions, the Commission will, by June 2021, review and propose to revise where necessary, all relevant climate-related policy instruments.

This will comprise the Emissions Trading System (ETS), including a possible extension of European emissions trading to new sectors, Member State targets to reduce emissions in sectors outside the Emissions Trading System, and the regulation on land use, land use change and forestry.

The Commission will propose to amend the Climate Law to update it accordingly.

These policy reforms will help to ensure effective carbon pricing throughout the economy. This will encourage changes in consumer and business behavior and facilitate an increase in sustainable public and private investment. The different pricing instruments must complement each other and jointly provide a coherent policy framework. Ensuring that taxation is aligned with climate objectives is also essential.

The Commission will propose to revise the Energy Taxation Directive, focusing on environmental issues, and proposing to use the provisions in the Treaties that allow the European Parliament and the Council to adopt proposals in this area through the ordinary legislative procedure by qualified majority voting rather than by unanimity.

As long as many international partners do not share the same ambition as the EU, there is a risk of “carbon leakage”, either because production is transferred from the EU to other countries with lower ambition for emission reduction, or because EU products are replaced by more carbon-intensive imports.

Should differences in levels of ambition worldwide persist, as the EU increases its climate ambition, the Commission will propose a carbon border adjustment mechanism, for selected sectors, to reduce the risk of carbon leakage.

III. HOW COULD THE EU DO ?

Under the supervision of Eric Chaney, the French think tank *Institut Montaigne* released in June 2020 a report called “*Carbon Dividend: a playing card for Europe*”.

¹¹ <https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1588580774040&uri=CELEX%3A52019DC0640>

1. To define the trajectory of the carbon price

The first step is to agree on a single carbon price trajectory across the Union.

This work should be done by an independent body on the basis of impact studies linked to the IPCC reports, which allow an estimate of the discounted cost of the damage caused by the emission of an additional tonne of CO₂, a rigorous basis for the concept of the social cost of carbon.

I confess that French people love to create institutions, but there is probably no alternative.

The Institut Montaigne report is suggesting creating a Carbon Agency at the EU level, to which States would entrust the mission of determining the trajectory of carbon price that is consistent with the objective of carbon neutrality in 2050. In the envisaged framework, its recommendations would be submitted to the Council and the European Parliament.

In a paper published on October 1st, 2019 published in French on their blog, the economists Jacques Delpla and Christian Gollier made an even more ambitious proposal: they suggested the creation of a Carbon Central Bank, mandated, as European Central Bank is for the money, to take care with a single primary objective in quantities: let the EU achieve net carbon neutrality in 2050. The CCB would then transform this primary mandate into a secondary mandate for the economy (a rising single price of CO₂), which would be integrated by economic agents in their strategic decisions and their day to day business.

This institution would have the same independence as the European Central Bank, with an alignment of its obligations vis a vis the other institutions.

2. To apply it within the common market

In a closed world, the simplest is to tax at source, that is to say fossil resources whatever their uses, as well as industrial activities producing CO₂ in addition to the use of fossil energy (cement, steel, chemicals ...).

To reach this objective, both cap-and-trade programs and carbon taxes can work well as long as they are designed to provide a strong economic signal to switch to cleaner energy based on the pre-defined trajectory.

Cap-and-trade provides more certainty about the amount of emissions reductions that will result, and little certainty about the price of emissions (which is set by the emissions trading market). On the contrary, a carbon tax provides certainty about the price but little certainty about the amount of emissions reductions. A carbon tax is also easier and quicker for governments to implement, just keeping in mind that, under the Treaties, it is a competency of Member States.

The cap and trade type system, launched in the EU in 2005, has been the subject of intense criticism, but has the merit of existing, of having evolved in the direction of a stronger constraint on emissions and the beginning of widening of its field of application. The Commission's green plan also foresees *"a possible extension of emissions trading to new sectors"* 15.

The market price of the resulting tonne of CO₂, ridiculously low until spring 2018, has since been on a clearly upward slope, reaching 30 € / t CO₂ last July. Futures contracts fluctuate around €26

At these levels, the price of allowances is starting to be sufficient to favor the production of electricity from gas rather than from coal in the fleet. production installed. However, price levels are still far from the level mentioned hereabove and are definitely not sufficient to support the deployment of new low carbon technologies.

On this basis, we would suggest, in the wake of Institut Montaigne recommendations:

- To keep the ETS in place, but to raise the prices and reduce its volatility by a mix of renegotiating allocations, in the direction of a reduction, and the introduction of a price corridor, around the trajectory of carbon price defined in consistency with the objective of carbon neutrality in 2050.
- To leave the Member States free to choose their method of imposing a single carbon price by a mix of a reinforced national version of the ETS and carbon tax, the common point being the pre-defined price trajectory, and a full coverage of the goods and services consumed
- To tax fossil resources (coal, oil, natural gas) extracted (or imported, cf. infra) into the European Union and industrial activities producing CO₂ sui generis by applying the targeted carbon price. Obviously, any activity already captured by the ETS framework (including its eventual national declination) would be exempted.

3. To adjust at the borders

In parallel, to avoid environmental dumping, EU will need to implement an adjustment at the borders (taxation of imports, subsidies for exports) making possible to send the price signal to all the goods and services consumed in the Union, to address the problem of "carbon leakage", and to level the competition conditions between the Union and its trading partners.

As the European Commission has the expertise and the leading role in international trade negotiations, it would be coherent for it to be responsible for determining the carbon content of imported goods and services and for negotiations concerning them with third countries, in link with institution establish to steer the carbon price at Union level. These missions would naturally fall under the DG Trade and DG Climate.

As the goal of border adjustment is not to generate a new fiscal resource, but to ensure coherence in the system, Institut Montaigne suggest to call the product of this resource a “carbon dividend”, rather than “carbon tax”, following an idea expressed by William Nordhaus.

At the end of the day, only exchanges with trading partners practicing the same carbon price would be exempt of border adjustment.

William Nordhaus had written in a paper¹² published in 2015 that without sanctions against countries that do not participate in decarbonation strategies, there can be no stable coalition of countries committed to climate change mitigation strategies. He also showed that even modest penalties imposed on recalcitrant via import taxes could favor the emergence of broad and stable coalition leading to a sharp reduction in emissions.

Institut Montaigne concludes that, provided that the carbon price trajectory is credible, the European Union is able to lead a coalition large enough to reduce very significantly GHG emissions.

4. To redistribute the “carbon dividend” to the economy

The common position of the French Economic Analysis Council and the Council of German Economic Experts, supporters of a single carbon price in Europe, is to return the carbon dividend to the private sector or to very precisely targeted environmental project with an impact on citizen’s life, by leaving the choice of methods to the national level.

This position seems to be the wisest and most in line with the principle of subsidiarity which underlies the distribution of responsibilities within the European Union.

A high and increasing carbon price over time may not be enough to achieve the targets, but without the powerful incentive it offers, any cocktail of regulatory measures and capital expenditure will fail.

¹² 2 ‘Climate Clubs: Overcoming Free-riding in International Climate Policy’, William Nordhaus, American Economic Review, 015, 105(4): 1339–1370.