

Economic policies for decarbonisation and the European Green Deal

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Abstract

The European Green Deal is a set of policies and plans aimed at making the European Union carbon neutral by 2050; it envisions a broad series of actions in all sectors of the economy, seeking a reduction in greenhouse emissions and contrasting climate change. This paper aims at shading light on some possible economic policies useful to tackle the issue, with a specific focus on carbon pricing policies, (in particular, Carbon Tax and the EU Emissions Trading System) and investments in the European Union context.

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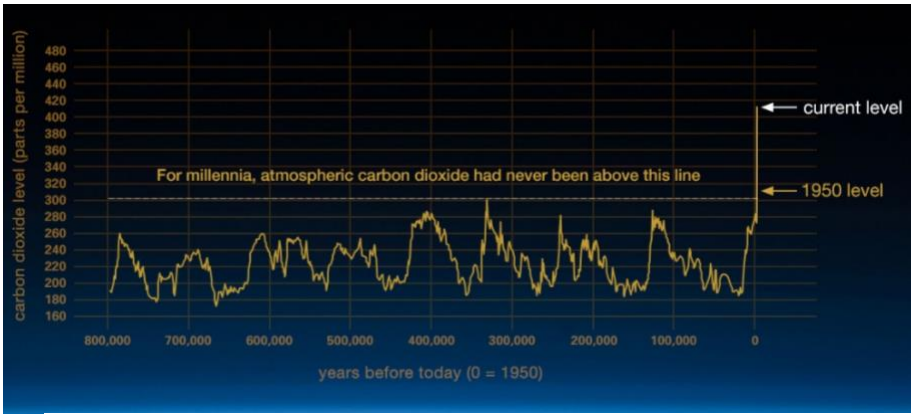
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Reasons behind decarbonisation

In order to comprehend the reasons behind the European Green Deal, it is of the utmost importance to sum-up the current understanding climate change and its causes. Firstly, there is widespread evidence that the climate is warming up, by a magnitude of 1.18 degrees Celsius since the late 19th Century.[1] Secondly, data has been testifying a skyrocketing level of carbon dioxide in the atmosphere over the time, starting approximately in the 1950s. Given that carbon dioxide, together with other gases, has an heat-trapping nature, studies affirm that the probability that the current climate warming is a human-caused phenomenon is greater than 95%.[2]

The effects of climate change are many and diverse, and they include greater number of floods



Source: climate.nasa.gov

(especially in East Africa, the Sahel, South Asia, China and Viet Nam), drought and fires, tropical cyclones, and a sea level rise that has already reached 20 centimetres. Food production, water supply and human health are also affected.

From an economic perspective, we could affirm that climate change leads to Pareto inefficiency. In fact, if in a competitive market economy there is no regulation on environmental issues nor individual concern for climate change, externalities are generated. In other words, individuals do not take into full account the consequences of their behaviour on other individuals, thus leading competitive equilibrium to Pareto inefficiency: individuals gain at the expenses of others (even at the intergenerational level).

It is therefore necessary to act in the key sector of the economy in order to contain global warming. It is still complicated to estimate the precise extent to which greenhouse gases emissions have to be reduced and the timespan of these actions, yet the Intergovernmental Panel on Climate Change report

[1] "Climate Change: How Do We Know?" climate.nasa.gov
[2] Fifth Intergovernmental Panel on Climate Change (IPCC) report

concluded that in order to meet the target of containing global temperature rise to 1.5 °C (as agreed in the Paris COP21) it is necessary to achieve a "virtually full" decarbonisation by 2050.3 This is also precisely the objective of the European Green Deal.

European Green Deal: general aims and overview

The European Green Deal, now implemented in the recovery package NextGenerationEU, is a broad plan of proposals targeting a reduction of greenhouse gases emissions by at least 50% to 55% from the 1990 level no later than 2030, and full carbon neutrality (zero net carbon dioxide emissions) by 2050.[4] In order to achieve the targets, the European Union is willing to decarbonise the energy sector, invest in environmentally-friendly technologies, develop new industrial policies, foster cleaner public and private transports, and cooperate with international partner in promoting stricter global environmental standards. Ensuring an inclusive transition is also clearly an aim of the plan, as the establishment of the Just Transitional Mechanism has testified.

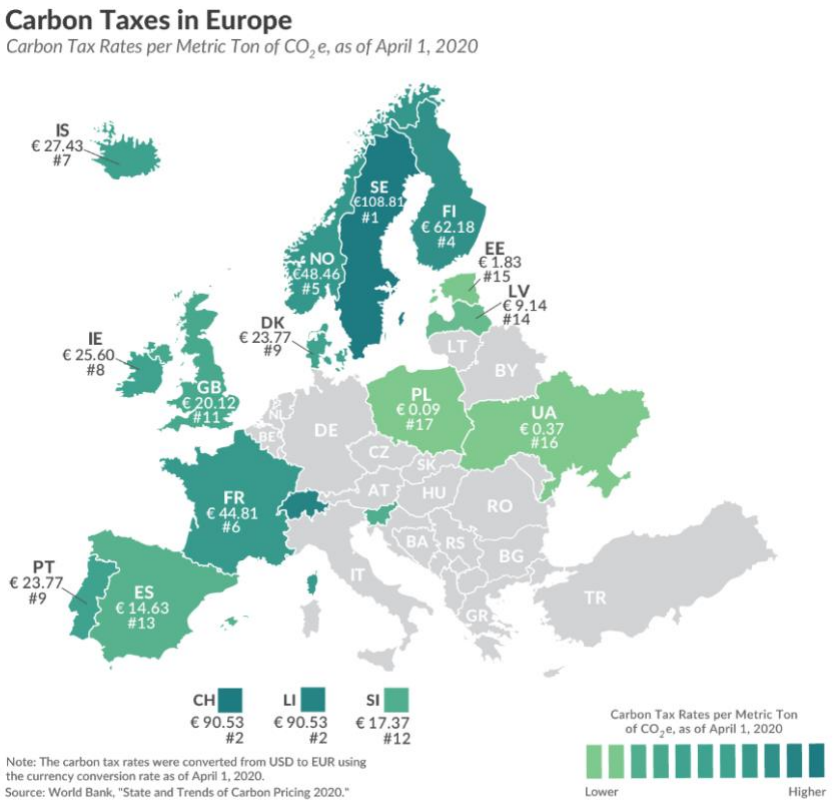
The plan includes potential carbon tariffs and carbon border tariffs, a possible revision of the Emissions Trading System (which is a market-based system of incentives for reducing emissions), plans of afforestation, and an investment plan of 1 trillion euros. Currently the general contours are clear, but the specific policies are yet to be structured. For these reasons, this paper will only broadly analyse the possible economic effects of some typical economic policies useful at tackling the issue, specifically within the context of the European Union.

Carbon Pricing

There are many economic policies that could help reducing greenhouse gas emissions; among them, putting a price on emission is a particularly relevant incentive towards decarbonisation. However, in the context of the European Union, it is still unclear whether the price should be the same for all units of emissions, or diverse from sector to sector or even for different countries. As matter of fact, adopting a unique price would be the most efficient solution, as it would lead to an equalization of marginal abatement costs (the costs to firms of decreasing their emissions by one unit), and therefore a inimization of overall costs of abatement.[5] However, it would produce substantial distributional effects, as some sectors actually have different marginal abatement costs, and therefore some would

[3] https://www.ipcc.ch/sr15/chapter/spm/
[4] https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en
[5] OECD Economic Outlook, Chapter VII, 198 https://www.oecd.org/economy/outlook/29173911.pdf

require much higher carbon prices than others.[6] Also, lower-income countries have generally high emissions per unit of GDP. As a result, a unique price would result in higher inequality and uneven distribution among different sectors and countries. A solution would probably be a slow gradual transition towards a single carbon price, with redistribution policies aimed at compensation of distortional effects. In this paper, the two major forms of carbon pricing will be evaluated: carbon tax and emission trading system. Currently, in the European Union there is no common carbon tax (even if various countries adopted it), but there is an emission trading system.



Carbon Tax

The European Commission announced that "the Green Deal acknowledges the crucial role of taxation in the transition towards a greener and more sustainable European growth and the need to better align our taxation systems with EU climate objectives.".[7] At the time of writing, the European Commission is still assessing the potential impacts of the measures, and no formal proposal has been initiated. However, an overview of the general economic instruments of taxation could be useful in

[6] Grégory Claeys, Simone Tagliapietra and Georg Zachmann, "How to make the European Green Deal work", Bruegel 2019

[7] https://ec.europa.eu/taxation_customs/commission-priorities-2019-24/european-green-deal-what-role-can-taxation-play_en

evaluating the possible economic and social consequences of the measure.

In primis, there could be two major economic tools for reducing emissions. Either a tax could be used, or a

quota, a fixed volume of emissions. As it is difficult to calculate the exact volume of emissions that should be allowed, and setting a wrong quota is highly risky, policymakers usually prefer a carbon tax. The European Union could set a **minimum tax rate** for Member States, and give them in this way a certain degree of flexibility, necessary to adapt to different economic contexts. As studies confirmed that the carbon tax is the most efficient way to curb climate change, it would be a very effective measure to ensure a reduction in emissions;[8] however, market redistributions and distortions may arise, as well as leakage problems. The main issue is therefore what to do with the revenue of the tax, and how to offset the possible distortional effects of the measure. The political viability of the policy is at stake. In this situation, it is particularly useful to check how other countries managed the issue. First, in *Switzerland*, the tax was successfully carried out, and the revenue was used in the form of a **lump-sum transfer**, where two third of the revenue was given to the population; in *British Columbia*, in *Canada*, it was decided to use the revenue to compensate the population of the lower deciles of the income distribution. These solutions (at least partially) offset the redistribution effect on lower-income population, that usually has higher production of carbon dioxide, a therefore bears in great measure the costs of the tax. On the other hand, perhaps the most famous example of an unsuccessful carbon tax is the *French* one, where the *gilets jaunes* movement made the French government abandon the project. A redistribution, targeting the most affected sectors or geographical area, or income deciles, is therefore of the utmost importance. With this regard, the European Union has created the *Just Transition Mechanism*, an additional fund worth €150 billion over the time 2021-2027, that will be used to compensate the social and economic costs of the transition in the most vulnerable and carbon intensive regions.[9]

There is then the issue of **leakage**, that is to say the risk of emission-intensive companies leaving the European Union (or transferring the production) to avoid the measure. A **carbon border tax** would ensure that all goods consumed in the EU - imported or produced domestically - are treated the same; it would also give incentives to other countries to decarbonise to reduce the costs of accessing the EU market. The carbon border tax, however, comes with some risks, mainly of potential retaliation

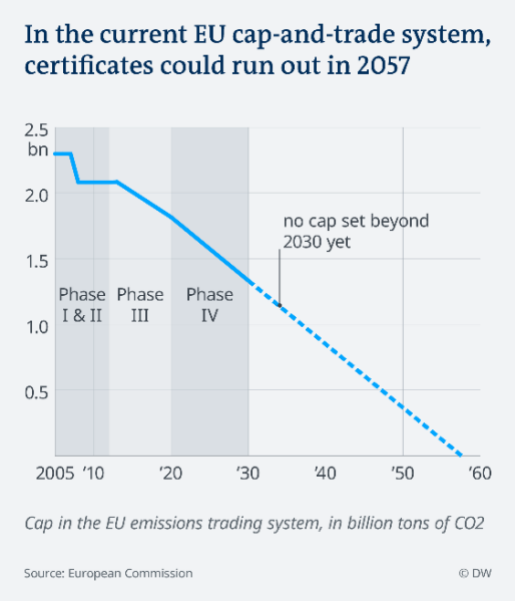
[8] Sujata Gupta and Dennis A. Tirpak "Policies, Instruments and Co-operative Arrangements", Cambridge University Press, 2007

[9] https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal/actions-being-taken-eu/just-transition-mechanism_en

from trade partners, and it is very politically challenging. Moreover, southern partner of the European Union heavily relying on hydrocarbons, such as Algeria and Libya, may suffer from a worsening of their socio-economic and political situation as a consequence of the carbon border tax. Moreover, given that within the *European Trading System* leakage has not represented a substantial issue,[10] a *trial-and-error* approach with a redistribution policy is probably the most politically-viable one. Subsidies could also be given to the companies that produce internationally traded goods with low emissions. In addition, a better coordinated structural diplomacy aimed at improving the global environmental standards is to be pursed, eventually through a reform of the Lisbon Treaty - that scholars have judged poorly-effective in this regard.[11]

Emissions Trading System (ETS)

The European Union has set in 2005 the largest emission trading system in the world, covering 40% of EU's CO_2 emissions and limiting emissions for more than 11,000 heavy energy-using installations and airlines. It works on the principle of "*cap and trade*": a cap (limit) is set on the total quantity of greenhouse gases that can be emitted by the installations covered by the system, and a fixed number of tradable emission allowances is auctioned off or given to companies. The CO_2 emissions are consequently monitored in each installation, and if they exceed the total quantity permitted by the possessed allowances, either the company buys more of them from other ones, or pays a heavy fine. In addition, the cap is reduced over time, by issuing fewer allowances; this ensure that total emissions



[10] Helene Naegele and Aleksandar Zaklan, "Does the EU ETS cause carbon leakage in European manufacturing?", Journal of Environmental Economics and Management, 2019

[11] Jan Wouters, Jed Odermatt, and Thomas Ramopoulos, "The diplomatic system of the European Union: Evolution, Change and Challenges", Routledge, 2015

decrease.

To sum up, the EU emission trading system creates financial incentives to cut the emissions where it cost less to do so, by virtue of issuing tradable allowances (a sort of carbon currency). Statistical studies confirmed that the EU ETS contributed to a reduction of CO_2 emissions by 3.8% from 2008 and 2016 (around 1.2 billion tons), without a significant increase in carbon prices.[12] [13] Scholars have suggested that carbon prices remained low because of the credibility of the European ETS system: as some firms expect higher costs on carbon emission in the long run, they are encouraged to invest in abatement technologies, even when carbon prices are low; in this way, they reduce demand for greenhouse gases (and the carbon price remains low).[14] For what concerns leakage, the ETS provides free allowances to sectors at high risk of relocation, and ex-post studies have shown that there is no evidence of a substantial leakage problem within the system.[15] On the contrary, difficulties may arise in the process of setting the cap, as if it is set higher than the demand for allowances, the price of these will fall, and if there are frequent revisions of the cap, price volatility will incur. As setting the "right" number of allowances is scientifically and technically challenging, uncertainty on expected returns could be generated, possibly leading to discourage in investments.[16] Nonetheless, the EU ETS system achieved its aims in a short period of time, and it is now a milestone economic instrument in tackling climate change; this success is testified by the will of the European Commission to present in June 2021 a proposal aimed at implementing new targets and possibly expanding the ETS, in line with the European Green Deal. The current discussions include a potential extension of the system to the maritime sector and a reduction of the free allowances to the aviation sector. If the number of allowances is properly set, this revision and extension would contribute to a more efficient fall in emissions.

Investments

In order to meet the 2030 emission targets, the European Commission has estimated the necessity

[12] Patrick Bayer and Michaël Aklin, "The European Union Emissions Trading System reduced CO2 emissions despite low prices", PNAS 2020

[13] A study by the London School of Economics, "Assessing the effectiveness of the EU Emissions Trading System" indicated a reduction between 2 and 4 per cent of capped emissions in a similar timespan.

[14] Patrick Bayer and Michaël Aklin, "The European Union Emissions Trading System reduced CO2 emissions despite low prices", PNAS 2020

[15] Helene Naegele and Aleksandar Zaklan, "Does the EU ETS cause carbon leakage in European manufacturing?", Journal of Environmental Economics and Management, 2019

[16] Simone Borgesi and Massimiliano Montini, "The Best (and Worst) of GHG Emission Trading Systems: Comparing the EU ETS with Its Followers", Frontiers in Energy Resources 2016

to additionally invest (both at the private and public level) €260 billion per year.[17] The housing sector contributes to around half of this green investment gap, while the transportation sector adds €21 billion to

the gap and the energy sector €34 billion. Among these, public investments play a major role, given the public-nature of some goods (as the transportation system). For example, old polluting vehicles should be replaced with more environmental-friendly ones, and the railway network is to be renovated. The investment plan was also complicated by the Covid-19 pandemic, and it is now clear that 37% of the resources of the recovery package *NextGenerationEU* will be used for green investments.[18] Overall, the Commission has a plan of 1 trillion euros over the next decade, around €100 billion per year. Therefore, in order to reach the €260 billion per year, private investments will be of the utmost importance. A good policy would ensure that governments and the EU use direct public investments and bear some of the losses in case of failures, as to reduce the perceived risk of private investors, and consequently boost investments.

Also, research and development is a fundamental sector for the success of the European Green Deal, and here public investments are pivotal and necessary. In fact, in 2019, in the European Union invested only 2.1% of its GDP on R&D, compared to 2.2% in China, 3.1% in the US, 3.2% in Japan and 4.6% in South Korea.[19] And evidences show that the European Union is slower than other countries in innovation in the technological, electronics and digital sectors. New technologies and innovations would ensure a better efficiency, and possibly create new carbon capture and storage systems. With this regard, a *European Innovation Council* was created, with the aim of financially support "*game-changing*" innovators and mitigate the innovation-risks. During its pivotal phase (2018-2020) it supported over 5700 startups and small-medium enterprises, who have raised over €5 billion in follow up investments more than doubled the number of employees in a 2-year period. For every euro of EU budget, three euros of follow-up investments were generated.[20] If properly implemented in the context of the European Green Deal, this instrument would be particularly useful in the field of clean energy and mobility. The EIC and the *Innovation Fund* – a €10 billion fund dedicated to supporting innovation in low-carbon technology – are therefore necessary tools in a policy-package aimed at decarbonisation, and they are fundamental if carbon-pricing policies are implemented.

[17] https://ec.europa.eu/commission/presscorner/detail/en/ip_20_17
[18] https://ec.europa.eu/commission/presscorner/detail/en/SPEECH_20_1655
[19] OECD data, https://data.oecd.org/rd/gross-domestic-spending-on-r-d.htm
[20] https://eic.ec.europa.eu/about-european-innovation-council_en

Concluding remarks

In order to reach the ambitious targets of decarbonisation, a broad and diverse package of economic policies is needed. The economic and industrial transformation may lead to problems of social inclusiveness and inequality that require additional policies. Moreover, the European Union is the first system of governance that has set a policy plan to tackle these issues. A success in the implementation of these policies would represent a tangible result for other regions and countries, eventually providing an example of how reallocation in key economic sectors, incentives to green investments, and redistribution for compensating the most affected actors, may help to decarbonise the economy without any broad redefinition of the economic system as a whole.

The aim is ambitious, yet the European Union already reached (and actually surpassed) the 2020 emission targets.[21] Hence, the final success of the *European Green Deal* will ultimately depend on the economic and political viability of its policy-packages.

[21] https://ec.europa.eu/clima/policies/strategies/progress_en

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