Will the COVID-19 pandemic help to curb greenhouse gas emissions?

The fight against COVID-19 has two major points in common with the fight against climate change. Firstly, although a pandemic can spread in a matter of weeks while climate change worsens much more gradually, both have the ability to evolve exponentially: in the former case through social contagion mechanisms and in the latter case through polluting emissions accumulated over time. Secondly, once the phenomenon has been identified and the necessary measures are taken to curb it, the costs become apparent immediately, whereas the benefits take a while to become visible.

In a famous speech in 2015, the governor of the Bank of England, Mark Carney, referred to climate change as the «tragedy of the horizon»,¹ noting that, as a collective problem that surpasses the traditional horizons of the economic and political cycle, current generations do not have the right incentives to combat it, even having access to all the available information on the devastating effects it will have in the future. Is it possible that, by highlighting the risks of inaction to address adverse events, the COVID-19 pandemic will help to accelerate the fight against climate change?

Of course, while COVID-19 is having devastating consequences for health and the economy on a global scale, the mobility restrictions imposed to curb the pandemic have reduced emissions across the world. In this article, we will discuss how much of a short-term impact the COVID-19 pandemic has had on polluting emissions and to what extent this is a lasting shift. Finally, we will present different future scenarios for the trend in polluting emissions.

The immediate effect of the COVID-19 pandemic: a temporary and insignificant reduction in emissions

The COVID-19 pandemic has forced millions of people around the world into lockdown and has led to the closure of schools, factories, shops, hotels and airports, with a drastic reduction in the mobility of the entire population. It is no wonder, then, that this pandemic has also reduced the levels of polluting emissions.

Although there is not yet any emissions data available for 2020, studies have been carried out that estimate how they have changed by sector in real time, based on mobility and economic activity data.² The Carbon Monitor project, for example, allows us to obtain estimates of daily carbon dioxide emissions (which represent 80% of all polluting emissions) in the energy, industrial, residential, land and air transportation sectors, based on data on electricity generation, production, mobility and fuel consumption, among others. As the first chart shows, the most drastic declines in emissions occurred in the first weeks of April, with global levels plummeting by 17.0% year-on-year in the second week. At the end of April, at a time when around half of the world's population was in lockdown, cumulative global emissions had fallen by 8% compared to the same period in 2019. The decline was

considerable, but it was quickly undone: by the end of September this cumulative drop had already been limited to 6% year-on-year with the gradual normalisation of economic and social activity, and by the end of November it had fallen even further, to 5%, despite the new restrictions imposed to curb the second wave of the pandemic.³ Beyond this dynamic observed in global emissions, there was a significant rebound in emissions in the energy and industrial sectors, which are responsible for 70% of total emissions, registering a cumulative reduction of 3% up until the end of November, in contrast with the cumulative decline of 7% up until the end of April.

Thus, we are talking about a temporary reduction in emissions in an exceptionally adverse context marked by a very high economic and human cost.⁴ In addition, it should be clarified that the effect of this temporary reduction will be small relative to the colossal challenge that climate change poses for our society. Indeed, while the Carbon Monitor estimates





Source: BPI Research, based on data from Carbon Monitor.

1. See M. Carney (2015). «Breaking the Tragedy of the Horizon – climate change and financial stability». Speech at Lloyd's of London. 2. See, for instance, T. Le *et al.* (2020). «Unexpected air pollution with marked emission reductions during the COVID-19 outbreak in China». Science, 369 (6504), 702-706. C. Le Quéré *et al.* (2020). «Temporary reduction in daily global CO_2 emissions during the COVID-19 forced confinement». Nature Climate Change, 1-7. Z. Y Liu *et al.* (2020). «Near-real-time monitoring of global CO₂ emissions reveals the effects of the COVID-19 pandemic». Nature Communications, 11(1), 1-12.

3. In Spain, the decline has been greater, as the total cumulative emissions reduced by 15% by the end of November, after reaching their lowest point (–19%) at the end of June. In the EU, total emissions reduced by 8% by the end of November and by almost 13% in the first half of the year.

4. Global GDP is expected to contract by around 4% in 2020, according to CaixaBank Research forecasts. In addition, as this Dossier is being written, more than 1.7 million people have already succumbed to COVID-19.

presented indicate a reduction in global polluting emissions of between 5% and 6% in 2020,⁵ which would represent the biggest decline since World War II, it is estimated that the average temperature of the planet will cool as a result of this drop by only 0.01 degrees Celsius between now and 2030 relative to the counterfactual scenario without the pandemic.⁶ Therefore, it is clear that only an economic recovery with a strong green imprint driven by ambitious measures to combat climate change, combined with the development of new technologies for capturing and absorbing polluting gases, can ensure we are in a position to meet the targets laid down in the Paris Agreement and limit global warming to 2°C above pre-industrial levels.

From COVID-19 to the long-term evolution of emissions: the ship has to change course

The magnitude of the structural change needed in our productive model to address global warming over the coming decades is evident. In order to achieve the targets of the Paris

EU carbon dioxide emission forecasts: the countdown to 2050 begins





Source: BPI Research, based on data from Eurostat.

Agreement, the EU has clearly defined the various battle grounds for cutting greenhouse gas emissions by between 80% and 100% by 2050 compared to 1990 levels.

How can we achieve this end goal? Taking into account pre-pandemic emissions data, estimates of the drop in emissions in 2020 (around –9% in the EU according to estimates by the Carbon Monitor) and the targets for reducing emissions by 2050, we have developed different scenarios for the potential evolution of carbon dioxide emissions in the EU over the coming decades. In the first scenario, from 2021 countries would maintain the trend observed between 2008 and 2018, with an average decline of 1.6% per year across the EU as a whole. In this case, by 2050 the EU would have reduced its emissions by just over 40% compared to 2018, well below the recently announced targets of a 55% cut in emissions by 2030 and zero net emissions by 2050.⁷ By tripling efforts and reaching a scenario in which emissions are reduced by 4.5% a year, the EU would achieve an 80% reduction between 2050 and 2055, with reductions of 40% as early as the mid-2030s.⁸ This would be a fairly significant sustained rate of decline in emissions, approximately equivalent to maintaining an annual reduction of half that seen in 2020 in the EU. To illustrate this pedagogically, it would be a reduction similar to that achieved with a two-month lockdown followed by a gradual return to normal spread over a period of six weeks (Le Quéré *et al.*, 2020).

On the other hand, if the post-pandemic recovery were to postpone Europe's efforts to cut emissions, or if investments within the framework of NGEU failed to have the anticipated effects, the scenario would be different. Thus, maintaining the current trend until 2030, between 2030 and 2050 annual emission cuts equivalent to those observed globally this year (between 5% and 6%) would be necessary in order to achieve a reduction of 80% by around 2050.

Finally, postponing climate action until 2040 would be very detrimental for the planet,⁹ and would also result in draconian reductions of 9% per year being required between 2040 and 2050 in order to achieve the aforementioned 80% reduction by around 2050. This rate of reduction would be similar to sustaining the levels of reduction observed in the EU in 2020, during a pandemic, for 10 consecutive years. Obviously, such a reduction in emissions would be almost impossible to sustain without inflicting enormous damage on the economy.

Ultimately, the scale of the climate challenge underscores the need to start taking ambitious action as soon as possible. The pandemic also reminds us that reducing polluting emissions cannot be done at the cost of a drastic reduction in economic activity. The smart thing to do, in order to meet the targets set, is to promote a green recovery that can revive the economy through cleaner, more sustainable technologies.

^{5.} There is, in fact, a wider range for the annual fall in emissions in 2020, according to data and estimation methods other than those of the Carbon Monitor. 5% seems to be the minimum figure that attracts a consensus, but some estimates suggest an annual decline of 7%-8% (International Energy Agency, 2020, «Global Energy Review» and United Nations Environment Programme, 2020, «Emissions Gap Report 2020»).

^{6.} See P. Forster et al. (2020). «Current and future global climate impacts resulting from COVID-19». Nature Climate Change, 10(10), 913-919.

^{7.} It is important to emphasise here that the EU average masks various trends observed in individual European countries in recent years. Maintaining the current pace, and focusing on the top five emitters (Germany, Poland, Italy, France, and Spain), Italy would reach 2050 with a 65% reduction in emissions, Spain with a 50% reduction, while Poland would see an increase in emissions of 5-10% and Germany (the main emitter) would reduce its emissions by just 30%.

^{8.} We assume that the scenario of zero emissions by 2050, or climate neutrality, will only be achievable with investments in mitigation projects or those generating negative emissions, such as efficient carbon dioxide disposal and storage technologies.

^{9.} See, for example, the recent reports produced by the Intergovernmental Panel on Climate Change (IPCC) and the Convention on Biological Diversity (CBD).

Will environmental awareness increase after the COVID-19 pandemic?

One of the positive consequences of the mobility restrictions imposed to curb the spread of COVID-19 has been a reduction of more than 5% in global greenhouse gas emissions. However, in order to comply with the Paris Agreement and thus limit global warming to less than 2°C relative to pre-industrial levels, it would be necessary to maintain a rate of emission reduction over the next few years similar to that seen in 2020, which has been the result of an exceptional situation. Given that the reduction in emissions in 2020 has occurred at the cost of a drastic fall in economic activity which has worsened living conditions, it is desirable that other factors should be the driving forces behind the fight against climate change in the future.

These other factors include the energy intensity of GDP (i.e. how much energy is consumed for every euro of GDP produced in an economy) and how polluting each unit of energy is. The steps for reducing greenhouse gas emissions must be aimed at decoupling economic growth from the consumption of natural and energy resources, as well as at producing cleaner energy. In recent years, both factors have been key to reducing greenhouse gas emissions in many regions of the world and helping to contain the growth of global emissions. Will these dynamics accelerate in the post-pandemic world, allowing us to achieve the targets of the Paris Agreement in the medium term? In particular, will the COVID-19 pandemic provoke a change in consumer preferences?

Greenhouse gas emissions explained



Climate change continues to be a source of concern despite COVID-19

Concern about climate change has been on the rise in recent years and, following the COVID-19 outbreak, not only has it not diminished, but it has continued to grow. In fact, 70% of participants in a global Ipsos survey conducted last spring consider climate change to be at least as serious a crisis as that caused by COVID-19. Moreover, for the second consecutive year climate change is the biggest concern in countries participating in the Pew Research survey, even ahead of the pandemic or the state of the global economy, and the percentage of respondents who see it as a threat now stands at 70% (67% in 2018).¹

If we look at the details of this survey by country, we see that concern is greatest in Europe: in 7 out of the 9 countries surveyed it is the biggest concern, while in the other two it comes second. In the US, in contrast, it ranks fifth, behind the spread of infectious

diseases, cyber-attacks, terrorism, and the use of nuclear weapons. There is also a positive correlation between the countries where this concern has increased the most since 2018 and the impact of the virus, measured by deaths per 100,000 inhabitants.

As a result of the COVID-19 pandemic, heightened environmental awareness has been amplified by the perception of the benefits of living in a cleaner world. The reduction in pollution during the weeks of full lockdown allowed many citizens to see first-hand the increased quality of life and well-being that comes with breathing cleaner air. In this regard, a study conducted in China shows that, in cities that experienced the greatest reduction in air pollution during the wave of coronavirus in February and March 2020, citizens' interest in environmental issues increased to a greater extent and more measures considered green were adopted in the following months.²

World: perceived threats to society

Percentage of the population that considers... as a threat to their country



Source: BPI Research, based on data from Pew Research.

^{1.} In a survey by the European Investment Bank, which is more focused on short-term threats, the challenge of climate change lies behind the COVID-19 pandemic and the economic and financial situation.

^{2.} See M.E. Kahn *et al.* (2020). «Clean Air as an Experience Good in Urban China». National Bureau of Economic Research.

Changes in consumption as a result of COVID-19

Beyond the changes in consumption patterns observed during the weeks when the pandemic limited social interaction, the COVID-19 pandemic may serve as a catalyst for changing some consumption patterns that could impact the environment in the medium and long term. On the one hand, the heightened perception of the risk of climate change after having lived through the pandemic could influence people's desire to consume goods and services more responsibly. In particular, consumers could increase their preference for local products, which would help reduce emissions from transportation. This is suggested by the result of a survey conducted in Germany by Deloitte, in which 28% of participants say that in future they will purchase local products more frequently than prior to the pandemic, compared with 68% and 4%, respectively, who would not change or would reduce their consumption of local products. However, while this is a step forward, some studies indicate how this rise in local consumption will have a relatively modest contribution to reducing greenhouse gas emissions, as the pollution generated by transportation in the food industry, for instance, is not very high.³

Another transformation of consumption patterns that has been accelerated by the COVID-19 pandemic is the increase in e-commerce, which was particularly marked in Q2 2020. Once the mobility restrictions were eased, retail sector purchases carried out online remained well above those observed in 2019, suggesting that the COVID-19 pandemic will have a persistent effect on consumption patterns.⁴ However, it is not clear in which direction a potential increase in online consumption would affect the fight against climate change, as the change in greenhouse gas emissions will depend on the delivery method used in online purchases. As an example, receiving products purchased online directly at home is more polluting than traditional retail given that, in the final step of the distribution chain, the delivery of the order from the last distribution point to the buyer (last mile delivery) results in a journey undertaken in a polluting means of transport. In contrast, with a system in which the distribution is carried out at a centralised collection point, greenhouse gas emissions are reduced compared to the two previous cases.⁵



Change in concern for climate change and impact of COVID-19

Notes: * Change between the 2018 Pew Research survey and that of the summer of 2020. **Prior to 9 June 2020.

Source: BPI Research, based on data from Pew Research.

Thus, the COVID-19 pandemic has helped raise awareness about climate change, opening up a window of opportunity for the consolidation of changes in consumption patterns that could help combat this phenomenon. On the other hand, this heightened awareness has also reached the corporate world, either through pressure from customers or due to the awareness of firms' own managers, shareholders or workers. The pandemic could thus lead companies to act in a more environmentally sustainable manner. Furthermore, there is mounting evidence that financial profits are not necessarily at odds with responsible behaviour: in 2020, companies with higher ESG ratings performed better than the overall indices.⁶ Finally, as we shall see in the article «The green recovery» of this same Dossier, there is no doubt that the COVID-19 pandemic will be a catalyst in the fight against climate change through more ambitious public environmental policies.

3. See J. Poore and T. Nemecek (2018). «Reducing food's environmental impacts through producers and consumers». Science, 360(6392), 987-992.

4. For more details, see the article «The awakening of e-commerce in the retail sector» in the MR12/2020.

6. An S&P 500 sub-index which groups together companies that meet a minimum set of ESG criteria had a 1.4% higher profitability than the S&P 500 index as a whole last year. ESG stands for environmental, social, and governance.

^{5.} See S. Shahmohammadi *et al.* (2020). «Comparative Greenhouse Gas Footprinting of Online versus Traditional Shopping for Fast-Moving Consumer Goods: A Stochastic Approach». Environmental Science & Technology, 54(6), 3.499-3.509.

The green recovery

Since there has been broad consensus on the need to transform the economy in order to make it environmentally sustainable, there has been a lot of emphasis on the important role that public policies must play. In the years prior to the COVID-19 pandemic, this broad consensus was forged at the global level and, in the case of the EU, there was a strong political will to transform the economy through the so-called Green Deal. This conviction has been redoubled after the outbreak of the pandemic. We are thus at a unique juncture to give even greater impetus to environmental policies, with support for a green economic recovery in the

short term and, above all, the transformation of the economic model in the medium and long term in order to make it more sustainable and environmentally friendly.

A stimulus that helps in the short term, but also looks to the future

One of the most noteworthy aspects of the European recovery plan, known as Next Generation EU (NGEU),¹ is the significant role to be played by projects that contribute to the fight against climate change. It is important to note that promoting such projects does not necessarily mean that the impact on economic growth will be any less.² In this regard, the attached table lists some of the measures that could play a leading role in driving a green recovery which have been targeted by several international agencies, such as the IMF.

However, achieving emission reduction targets will also require additional measures which, in some cases, could slow down economic growth. For example, there is broad

Green recovery: measures it could include

Industry and homes	 Aid to improve energy efficiency, both in industry and in the renovation of existing buildings. Making receipt of the public aid conditional on improvements being achieved in certain environmental indicators.
Energy	 Strengthen the power grid to allow it to take on more capacity. Accelerate the construction of wind and solar energy generation infrastructures.
Mobility	 Expand the electric vehicle charging network and assist in its manufacture. Improve urban mobility through public transport and cycle paths. Strengthen the rail network to facilitate interurban mobility and encourage its use for medium/long-distance travel.
R&D	 Promote research and development in new technologies that will be key to the energy transition: Green hydrogen. Capture and storage of greenhouse gases.

consensus among economists on the need to impose a tax on emissions (known as carbon price) that discourages the production of polluting goods and services in favour of those that are more environmentally sustainable. In this regard, a recent IMF study notes that the implementation of a global set of measures such as those described in the table, combined with the application of a carbon price that gradually increases, would not hinder long-term growth and would have a positive effect on the environment. Specifically, thanks to these measures, greenhouse gas (GHG) emissions in 2050 could be reduced by 80% compared to current levels, and the remainder required to reach climate neutrality would be achieved by extracting emissions from the atmosphere using both natural processes, accelerated through reforestation, and artificial processes, such as carbon capture and storage. The impact of this set of measures on the global economy would end up being neutral in the long term: the cumulative growth up until 2050 in the event of taking these measures would be very similar to that in a scenario in which these measures are not carried out. Moreover, this comparison does not take into account the possibility that, without these measures, the damage to the economy could in fact be much greater, as it would increase the risk of extreme weather events that have a high economic impact. Indeed, it is estimated that the increased frequency and violence of adverse weather events and the change resulting from new weather patterns in some regions could reduce global GDP in the year 2100 by between 15% and 25% if timely action is not taken.³

In terms of job creation, a green recovery leads to a relocation of jobs between the most polluting and the cleanest sectors. If we focus on the energy sector, the labour intensity (the amount of employment per unit of energy produced) of renewable sources is much higher than in the fossil-fuel-based energy generation industry, especially in the case of photovoltaic solar energy. Several studies support this and find that the generation of employment when investing in renewable energies and energy efficiency is almost three times greater than in the fossil fuel industry.⁴ In any case, the green recovery must take into account

^{1.} See «Everything you ever wanted to know about the European Recovery Plan but were afraid to ask» in the MR11/2020.

^{2.} In particular, there is a fiscal multiplier for short-term green investments of between 0.6 and 1.1, in line with the multipliers for total investment. See H. Pollitt (2011). «Assessing the implementation and impact of green elements of Member States' National Recovery Plans. Final report for the European Commission (DG Environment)». Cambridge Econometrics.

^{3.} See M. Burke, M. Davis and N. Diffenbaugh (2018). «Large potential reduction in economic damages under UN mitigation targets». Nature.

^{4.} In particular, it is estimated that an investment of 1 million dollars in renewable energies and energy efficiency generates 7.5 jobs (2.7 in the case of a fossil-fuel investment). See H. Garrett-Peltier (2017). «Green versus brown: Comparing the employment impacts of energy efficiency, renewable energy, and fossil fuels using an input-output model». Economic Modelling, pages 439-47.

those sectors that may be adversely affected, since in the absence of compensation mechanisms, the transition could not be carried out harmoniously and fairly.⁵

The EU is strongly committed to the green recovery

In the case of NGEU, some 312.5 billion euros are expected to be paid out to EU Member States in the form of grants and a further 360 billion in loans between 2021 and 2026 in order to finance investment projects and reforms. The specific actions of the recovery plans must be presented by the Member States. However, on the climate front – one of the top priorities of NGEU, with

NGEU and GHG emissions



Source: BPI Research, based on data from the ECB and the European Commission.

30% of the funds earmarked for combating climate change – they will need to focus on boosting clean and renewable energies, investing in cleaner transportation and improving the energy efficiency of buildings.⁶ If we focus only on the grants, most of them will be allocated according to the GDP of each country and the impact of the COVID-19 pandemic. In this regard, although unintentional, the distribution of these funds will be positively correlated with individual countries' intensity of greenhouse gases per euro of GDP. This is a very positive development, since if investments are made properly, relatively more polluting countries will be able to catch up with those that already have a cleaner production model.

In the case of Spain, the European grants will amount to 72 billion euros (around 6% of the GDP of 2019), of which 37% (26,640 million euros) will go towards green investments. The impact that these aids will have on economic activity and employment could be much greater than that observed

in previous recovery plans. Specifically, the estimates described in this article regarding the impact on the labour market suggest that, for every euro of the 26,640 million, up to 60% more employment could be created compared to under the PlanE of 2008, provided the investments are made properly.⁷

5. See «The EU's climate transition: a question of justice» in the MR06/2020 for further details.

6. See «The Recovery Plan for Europe: a green wave for the real estate sector» in the Real Estate Sectoral Report of \$1 2021.

7. The PlanE was the fiscal stimulus plan, without environmental conditions attached, which Spain implemented in 2008 in order to finance investment projects. It is estimated that for every million euros of the project, 5.7 jobs were created, whilst with green investment, according to the data shown in note 4, this figure could be around 9. See M. Alloza and C. Sanz (2019). «Jobs multipliers: evidence from a large fiscal stimulus in Spain». Working Paper 1922. Bank of Spain.

The geopolitics of climate change in the post-pandemic scenario

The pandemic of 2020 could become a major turning point of this century. This is a century marked by radical change and transformation, as demonstrated by such phenomena as the 2008 financial crisis, the emergence of the digital economy, the consolidation of China as one of the new pillars of the global economy, and... the acceleration of climate change with the resulting heightened environmental awareness.

Furthermore, the decade that is now beginning will probably also mark a turning point in geopolitics and international trade. The escalation of trade tensions between China and the US is reshaping the battlefield. As such, all the indicators suggest that over the coming years the epicentre of the discussion will not be on trade deficits, but rather will shift towards issues such as the

intensity of greenhouse gas emissions and technological decoupling. Since the onset of the health crisis generated by the pandemic, the need for shorter and more resilient global value chains has already been raised. In this regard, governments could legislate to promote the local production of certain goods and services that are considered essential, such as essential healthcare equipment. The pandemic could thus reinforce protectionism at the global level, creating the political and social consensuses needed for the creation of more self-sufficient energy networks, industries and distribution chains. The EU has already given this movement a name: strategic autonomy. This change in trade relations will coincide with one of the great challenges of our time: climate change. As we will see in this article, the fight against climate change and the goal of reaching 2050 with zero net greenhouse gas emissions could serve as an important impetus to rewrite the rules of international trade and geopolitics.

Green international trade: ambitious targets but time for a transition

How can an international trading system be designed to be efficient, fair and to help achieve the targets outlined in the

Global carbon dioxide emissions: main emitters

Annual emissions (100 = year 2000)



Source: BPI Research, based on data from Global Carbon Project.

Paris Agreement? On the side of the major pollutants, there are hopeful signs: according to a report by the Global Energy Monitor (GEM), the installed capacity for coal-fired power production fell in the first half of 2020 for the first time in history. China, the country responsible for the highest share of emissions, has set itself the goal of achieving climate neutrality by 2060 and tripling its installed wind and solar power capacity over the next decade. Among the world's largest producers of oil and natural gas, meanwhile, the vast majority have announced plans this year to significantly reduce their emissions over the coming decades. Finally, US President-elect Joe Biden has reaffirmed his commitment to the Paris Agreement, his desire for the US to achieve climate neutrality by 2050 and his intention to implement a two-trillion-dollar investment plan over the next few years, with a strong focus on clean energies and sectors that are key to the green transition.

Even so, we are still in a transitional phase, and international cooperation mechanisms have been greatly weakened in recent years, which is expected to make it even harder for the good intentions announced to date to be turned into tangible and effective policies. In this context, effort must be put into devising instruments that help align each country's incentives with the global emission reduction targets, prevent environmental free-riding and establish good practices. One of these policies is cross-border emission taxes. Let's see what it is all about.

Carbon border taxes: the tariffs of the 21st century?

The course set by the EU and other major emitters for the coming decades in the field of emission reductions will lead to a significant rise in the levies on those emissions.¹ This could contribute to the relocation of the most polluting industries from

^{1.} Mechanisms will be introduced making greenhouse gas emissions more expensive. There are two mechanisms for increasing the cost of greenhouse gas emissions: an emissions market (the regulator sets a maximum limit on the total amount of tonnes of CO₂ that can be emitted per year and region and, within the limit set, companies receive or purchase emission rights which they can then trade between one another) and an emissions tax (the regulator sets a price on greenhouse gas emissions that gradually increases).

«green» countries or regions to «brown» destinations, where they can gain a competitive advantage thanks to the lower price of emissions and export to other destinations from there. This phenomenon is known as carbon leakage. This has sparked a debate on how to avoid such leakage, with proposals such as a European mechanism for adjusting emissions at the border. This would essentially amount to a cross-border tax that is charged on the emission content of imports of goods and services, in a manner similar to the emission taxes to be imposed at the European level.²

Although its final design may vary, the plans outlined in the context of the European Green Deal seem to favour a cross-border adjustment mechanism targeted at specific sectors, with the aim of responding to two of the main challenges of its implementation: its administrative complexity and its legality within the framework of the World Trade Organization (WTO).³ However, the fact that this plan only focuses on certain sectors could generate a significant substitution effect. This could result in an increase in imports of those sectors that are not taxed by this adjustment mechanism (especially products that are not subject to it) but which incorporate raw materials from sectors that are subject to the tax (an example of this problem in another context unrelated to climate change has occurred in the US, where very high tariffs have been imposed on metal, but nail imports were not taxed). Thus, a mechanism limited to certain sectors, despite its symbolic value, is likely to end up with limited effectiveness. Hence the importance of ensuring that this mechanism can be applied across most sectors and that the carbon footprint of all products and their components can be traced.

The implementation of such a mechanism is not only technically difficult, but also complex to implement at the political level. On the one hand, the countries hardest hit by this tax will tend to be emerging ones, as they generally have a lower capacity to produce clean energy. Therefore, there will be a debate over whether the revenues from this mechanism should be dedicated to strictly European projects (in which case it could be perceived as a protectionist tool) or to providing aid to the countries from which the taxed products originate in order to help them produce those products in a cleaner manner. On the other hand, this mechanism could lead to a domino effect of environmental protectionism if the countries subject to these taxes decide to retaliate.⁴

In the face of these problems, the European authorities will have to tread very carefully in order to develop an emission adjustment mechanism that is effective but avoids provoking major geopolitical tensions. Only in that case will such a mechanism succeed in setting an example for the world's other economies to accelerate the implementation of good environmental practices everywhere.

Green international trade: there are alternatives but no panaceas

What are the alternatives to the border adjustment mechanism? One possibility is international coordination for the introduction of emission caps allocated by industry or country, and taxes on excess emissions similar to the EU's emission trading system. These international coordination tools are expected to gain traction on both sides of the Atlantic, following the election of President-elect Joe Biden, as a way to apply pressure on other countries (particularly China and India) to bolster their efforts in the energy transition. A complementary alternative, which would require a greater degree of international cooperation than that shown to date, would be the creation of «climate clubs»,⁵ that is, trade agreements among countries that have agreed on a certain international price on their emissions. These clubs would have two essential characteristics: on the one hand, their members would commit to setting the agreed common price on their emissions rather than negotiating national emission reductions. On the other hand, countries that decide not to participate in such clubs would be penalised, for instance through cross-border quotas, tariffs and adjustment mechanisms. These «climate clubs» could thus constitute a multilateral forum that could prove very useful for aligning the emission reduction incentive structures of the Paris Agreement's signatory countries. Moreover, the costs of not being part of the club would increase with their size, as countries that choose not to participate would lose the opportunity to gain unhindered access to the markets of the club's members.

In this context, and in a particularly volatile geopolitical environment, the importance of reaffirming and strengthening the leadership of supranational institutions is particularly significant, as it would enable ambitious and lasting policies to be adopted. Currently, shorter-term policies – such as border adjustment mechanisms – are being proposed to fill the gap left by the

^{2.} See, for instance, M. Mehling et al. (2018). «Beat protectionism and emissions at a stroke». Nature, 559, 321-324.

^{3.} It is easier to restrict this mechanism to the most polluting sectors than to extend it to all products, since all contributions at all stages of the production chain would have to be calculated. Furthermore, this mechanism is only envisaged for imports of products subject to environmental taxation at the domestic level. Today, for example, only 40% of EU emissions fall under the EU emission allowance scheme. See, for instance, D. Gros and C. Egenhofer (2010). «Climate change and trade: taxing carbon at the border?» and G. Zachmann and B. McWilliams (2020). «A European carbon border tax: much pain, little gain». Bruegel Policy Contribution Issue n° 5. 4. The only border adjustment mechanism in force is currently applied in the California energy market, covering 85% of all polluting emissions, and illustrates the importance of the mechanism's design in order to minimise trade deviations (OECD. 2020. «Climate Challenge and Trade: Would border carbon adjustments accelerate or hinder climate action?»).

^{5.} See W. Nordhaus (2019). «Climate Change: The Ultimate Challenge for Economics». American Economic Review, 109(6), 1991-2014.

weakening of international cooperation in recent years. However, looking ahead to the future, new steps will have to be taken. In the case of the WTO, the main sentinel of international trade, trade disputes are likely to be rekindled over the coming years as a result of the rise in protectionism, the rethinking of global supply chains, disparate environmental targets and latent geopolitical tensions. If the negotiations for a post-Brexit trade agreement between the United Kingdom and the EU have proven to be thorny, designing new international trade mechanisms to promote environmental protection will be no less so. Commitment to the environment from all parties, in a spirit of global cooperation, will be key.