

Carbon Fee and Dividend in the European Union



Policy Brief by Citizens' Climate Europe

Contents

| | |
|--|----|
| Executive Summary..... | 2 |
| 1. Introduction | 4 |
| 2. Why now? | 5 |
| 3. Core Principles..... | 5 |
| Core Principle 1: A predictable and steadily rising carbon price | 5 |
| Core Principle 2: Recycling of revenues to citizens in a fair and transparent manner | 8 |
| Core Principle 3: A border carbon adjustment..... | 10 |
| Core Principle 4: Simplicity | 13 |
| 4. Key EU policies considered | 14 |
| 5. What the CCL core principles could look like in EU policy | 16 |
| Option 1: Repurpose the ETD as an economy-wide carbon price..... | 16 |
| Option 2: Introduce a floor to the ETS and gradually extend it to all major sectors..... | 17 |
| Option 3: Allow for 2-way conversion (i.e. fungibility) between EUAs (ETS) and AEAs (ESR)..... | 18 |
| Acknowledgements..... | 19 |
| References..... | 20 |

Version: July 2020

Executive Summary

This brief has been prepared by Citizens' Climate Europe (CCE), the European entity representing Citizens' Climate Lobby (CCL), a global, non-partisan organisation that advocates specifically for Carbon Fee and Dividend. CCL is comprised almost entirely of volunteer citizen lobbyists. It has been operating since 2007 and is now active in 60 countries worldwide. In Europe, CCL engages EU-level bodies, such as the European Parliament and Commission, via CCE, as well as national governments via local CCL chapters in 13 European countries¹. CCL has civil society status at the G7, the G20, the UNFCCC, the World Bank, and is also a founding strategic partner of the Carbon Pricing Leadership Coalition, which brings together leaders from the public sector, the private sector and civil society to investigate and promote carbon pricing.

Each of CCL's chapters around the world needs to adapt the CCL solution to the unique circumstances in their jurisdictions. Although the details of these proposals may vary, they are always based on four key principles:

- 1) **A predictable and steadily rising carbon price.** Developing and deploying many of the technologies and processes needed for deep decarbonisation will require significant long-term investments. Given the urgency of the climate crisis, as well as the time it will take for many of these solutions to become viable and be adopted at scale, those investments are needed now. But, absent a predictable and steadily rising price on emissions, actors will struggle to predict if and when such investments will pay off. While the EU's cap-and-trade scheme – the Emissions Trading System (ETS) – does introduce a carbon price, the long-term trajectory of that price is difficult to predict and subject to occasional declines. In part, this is because future ETS allowance prices depend not just on the allowance cap, but also on the future demand for allowances from all ETS participants, which in turn depends on a number of factors that are impossible to project with precision. In addition, the point at which the cap is expected to become materially constraining for many firms may fall outside their normal planning cycles. In addition, the ETS applies to only about half of EU emissions, with the other half either unpriced, or covered by heterogeneous national-level pricing systems. So, to ensure a clear and consistent investment signal is sent to all actors, CCL recommends a minimum, economy-wide carbon price that rises steadily at a predetermined rate, a carbon fee.
- 2) **Recycling revenues to citizens in a fair and transparent manner.** Whether decarbonisation is achieved through a carbon price or other regulations, the costs producers face will increase as decarbonisation deepens. Ultimately, much of this rise will be passed on to consumers in the form of higher prices. Measures to protect them are therefore needed to ensure climate policies maintain political support. This is best achieved by returning all net² revenues received from the carbon fee to citizens in the form of a monthly dividend. Assuming a lump sum dividend paid equally to all of a country's citizens, carbon fee and dividend together would be progressive, with the majority of households experiencing a net benefit. As was seen in Canada, where a similar policy was enacted, the regular receipt of carbon dividends not only preserves consumers' purchasing power, but also raises voters' interest in preserving the policy. That said, a carbon dividend will not entirely solve every challenge caused by climate policies, especially those stemming from deeper structural issues. However, this is true of any climate policy considered in isolation. In reality, a Carbon Fee and Dividend policy can and should be complemented by other policies, which need not be tied to the carbon fee revenues.
- 3) **A border carbon adjustment (BCA).** As the domestic price on emissions rises, the risk will increase that firms seek to import more of their carbon-intensive goods and materials from abroad, causing

¹ As of writing.

² Net revenues are those remaining after paying the system's administrative costs.

what is known as carbon leakage. In order to successfully mitigate climate change, though, the EU cannot ignore its global impact, and so must implement policies that encourage firms to reduce emissions from both their domestic production and their imports. It must also find ways to encourage equivalent mitigation efforts abroad, and a BCA is one tool for doing so.

- 4) **Simplicity.** With respect to carbon pricing, simplicity means a single, economy-wide carbon price charged as far upstream as possible. A simpler policy creates fewer administrative burdens and makes compliance obligations clearer for those it covers. Crucially, it is also more transparent and credible. In addition, simplicity makes the EU's lead easier for other countries to follow, especially those lacking the resources and institutions to implement a more complex approach.

The EU already has many long-standing climate policies in place as a result of its leadership on climate action. However, this makes the enactment of a single, overarching Carbon Fee and Dividend regulation challenging. Therefore, this brief suggests ways of integrating the CCL core principles into the EU's existing frameworks, with a particular focus on the Energy Taxation Directive (ETD), the ETS, the Effort Sharing Regulation (ESR) and the European Commission's proposal for a BCA. This is not an exclusive list of recommendations. It is meant simply to illustrate that it is possible to incorporate the key aspects of Carbon Fee and Dividend into EU existing policies. The 3 options presented are: (i) Repurpose the ETD as an economy-wide carbon price; (ii) Introduce a floor to the ETS and gradually extend it to all major sectors; and (iii) Introduce a floor to the ETS and allow for 2-way conversion (i.e. fungibility) between ETS allowances and member states' annual emissions allocations under the ESR. In each case, a BCA would be enacted, and its fee level would be tied to the minimum EU carbon price established via either the ETD or the ETS floor.

The Green Deal aims to put climate change at the heart of every major EU policy, and the Commission has laid out an ambitious plan to do so in short order. However, after negotiations on the Green Deal are completed, there will likely be little political appetite for additional large-scale reforms for years, if not decades. Therefore, decisions made today could largely decide whether the EU succeeds in reaching its climate targets or not. And, as a worldwide leader on climate action, the EU's decisions will also have global repercussions, effectively setting a ceiling on climate ambition in many countries around the world. It is therefore critical that the Green Deal's reforms are as ambitious and effective as possible, even where this is politically difficult.

In this regard, Carbon Fee and Dividend should be seriously considered. It can provide a strong, long-term price signal to drive investment in decarbonisation, while at the same time protecting consumers and building political support for the policy. Paired with a border carbon adjustment, it would reduce both the EU's production- and consumption-based emissions. Although it needs not – indeed, should not – be the only climate policy enacted, economic models indicate that it would be particularly effective. And, as this brief illustrates, it is entirely possible to integrate it into the EU's existing frameworks.

1. Introduction

Citizens' Climate Europe (CCE) is the European entity representing a global organisation known as Citizens' Climate Lobby (CCL), a non-partisan organisation that advocates specifically for Carbon³ Fee and Dividend. CCL (including CCE) is comprised of trained citizens, essentially all of whom are volunteers⁴. These citizen lobbyists work in their free time to build and maintain respectful relationships with policymakers across all parties in order to promote Carbon Fee and Dividend policies.

Although CCL recognizes that Carbon Fee and Dividend is not the only policy needed to mitigate climate change, it is the one the organisation chooses to focus on because it has been shown by numerous experts to be particularly effective. CCL calls for an upstream price on the sources of greenhouse gas emissions that rises credibly and steadily each year to send a clear price signal that allows businesses and individuals to better plan their investments. CCL also proposes that the revenues generated from this carbon price be returned to citizens in the form of a dividend to make ambitious carbon pricing socially and politically feasible.

CCL began operating in 2007 in North America – primarily in the U.S. and Canada⁵ – and now has over 500 active groups in 60 different countries worldwide with nearly 200,000 listed volunteer members. In addition to the pan-European entity (i.e. CCE), CCL is also represented in Europe at the individual country level through national chapters. As of writing, there were 11 such groups with mature operations (Belgium, Denmark, France, Germany, the Netherlands, Norway, Poland, Portugal, Spain, Sweden and the UK), as well as 2 branches either newly created or in the process of being established (Bulgaria and Romania).

CCL has civil society status at the G7, the G20, the UNFCCC, the World Bank and the IMF. It is also a founding strategic partner in the Carbon Pricing Leadership Coalition (CPLC). Formed on the opening day of COP21 in Paris, CPLC brings together leaders from governments, companies, NGOs, academia and civic organisations to investigate and promote carbon pricing as an instrument for limiting warming to 1.5°C. The CPLC Secretariat is administered by the World Bank. Its 34 government partners include 10 EU member states, while its list of 164 private sector partners features many of Europe's largest businesses. During COP22 in Marrakech, CPLC convened a High-Level Commission on Carbon Prices to produce a flagship report in 2017 on carbon pricing (Stiglitz and Stern 2017).

CCE and CCL recognize that the EU has many existing and long-standing climate policies, which makes the enactment of a single, overarching Carbon Fee and Dividend regulation unlikely in Europe. However, the core principles underlying the CCL solution should still be used to guide the reforms being undertaken as part of the Green Deal. This policy brief outlines those core principles and discusses how they could be incorporated into the EU's existing regulatory framework.

³ Note: Unless specified otherwise, terms like “carbon” and “decarbonisation” are used to refer to greenhouse gas emissions in general.

⁴ In Europe, all members of CCE and CCL national chapters are volunteers.

⁵ In the U.S., CCL is a leading proponent of the proposed House bill H.R. 763: The Energy Innovation and Carbon Dividend Act, which has bipartisan support. In Canada a Carbon Fee and Dividend policy was implemented as the "Greenhouse Gas Pollution Pricing Act" in 2019, which saw citizens receive their first dividends in April that year.

2. Why now?

The Green Deal aims to put climate change at the heart of every major EU policy, and the European Commission's Green Deal roadmap lays out an ambitious plan to do so in short order. But there is a limit to the time and energy the EU can devote to its internal climate negotiations, and this exercise will greatly deplete its political resources. Therefore, once the Green Deal's reforms are agreed upon, it could be well over a decade before the EU is again prepared to attempt major overhauls.

The importance of the Green Deal extends far beyond Europe. The EU has consistently been the leader on climate action among the world's largest economies, so it must assume that no other major economy will agree to mitigation plans more ambitious than its own. In other words, the EU's plans could effectively establish a ceiling on the commitments other regions are prepared to make.

Unfortunately, time is short when it comes to mitigating climate change, so the Green Deal may well represent the EU's one opportunity to reform its climate policy within the timeframe science demands. If so, that means that decisions taken today will determine whether the EU's efforts to mitigate climate change – and convince the rest of the world to do the same – will succeed or fail. It is therefore crucial that the policies currently being contemplated are as ambitious as possible and take into account the entire regulatory landscape at once.

The Commission clearly appreciates these points already – its Green Deal communication explicitly lays out ambitious and cross-cutting objectives, and its outreach efforts indicate it wants to ensure the Green Deal is as bold and comprehensive as possible. We reiterate them nonetheless in the hopes that no good options are ruled out in advance just because they may be more politically difficult. Now is not the time for incremental improvements, but wholesale reforms. There may not be another chance.

3. Core Principles

The CCL proposal rests on four main principles:

- 1) A predictable and steadily rising carbon price,**
- 2) Recycling of revenues to citizens in a fair and transparent manner,**
- 3) A border carbon adjustment, and**
- 4) A simple and harmonized economy-wide carbon price.**

Starting from a blank slate, these principles would shape a single, comprehensive policy: Carbon Fee and Dividend, the solution CCL advocates for worldwide. However, in the EU, where ambitious climate policies are fortunately already in place, we acknowledge an overarching Carbon Fee and Dividend regulation is unlikely. However, CCL's core principles are still a useful guide for discussions on future reforms.

Core Principle 1: A predictable and steadily rising carbon price

Driving investment in decarbonisation is a key objective of carbon pricing. The technologies and processes needed to decarbonise many activities are still not technically or economically viable, at least not on the scale needed. In several cases, they are still to be developed. In order for these technologies to advance and be adopted, significant long-term investments are required. Currently, though, such investments are well below the level needed (IEA 2020).

The longer decarbonisation is delayed, the more it will eventually cost. To meet targets in 2030 and beyond, work needs to begin in earnest now. If not, it will need to be considerably accelerated in later years (UNEP 2019), which would surely increase expense. Worse, if delays are serious enough that costs spike, leaders will face intense political pressure to relax regulations. Perversely, a sharp rise in costs may even cause actors to expect such an intervention, further delaying action and increasing the

probability that such an intervention actually takes place (Acworth et al. 2017). In short, climate policies need to offer strong incentives to make significant long-term investments now.

Each delay is more costly than the last

The UN Environment Programme's 2019 Emissions Gap Report concluded that limiting warming to 1.5°C will require annual global emissions reductions of 7.7% starting today. However, if worldwide emissions had peaked in 2000, annual reductions would have only had to average 3.3% (UNEP 2019). For comparison, estimates of the emissions decrease in 2020 due to Covid-19 range from 4-7%, depending on how quickly pre-pandemic conditions are restored (Le Quéré et al. 2020).

The effectiveness of climate policies in driving these investments will depend on actors' ability to translate them into financial impacts, which cannot be taken for granted. For a variety of reasons, actors may underestimate the future financial impacts of measures that limit emissions via caps and standards (Acworth et al. 2017).

For instance, corporate planning cycles rarely extend past 5-6 years. Beyond this point, the implications of climate policy become increasingly abstract. Decision makers may therefore underestimate the scarcity value of the capacity to emit outside the short-term and delay decarbonisation investments until costs become more tangible (ibid).

In addition, under a cap-and-trade scheme, projecting costs is further complicated by the fact that they are a function of not just the cap itself, but also the demand for emissions allowances from all installations it covers. Demand for allowances, in turn, depends on multiple factors, including firms' climate ambition, the technologies available to them (some of which may not yet exist), the change in demand for their end products and any overlapping policies to which they are subject (e.g. renewables targets, coal phase out legislation, emissions standards, etc). Thus, a given company under a cap-and-trade scheme must first attempt to project all of the factors above for every installation in the system before it can incorporate an estimate of carbon prices into its investment decisions. If the cap applies to multiple sectors, the company will need to consider all of them, including those about which it is less knowledgeable. And, depending on the company's investment horizon, these projections will need to extend out for years, if not decades. Clearly, this is not a simple task.

The difficulty of converting climate policies into investments

Although CCL does not take a position on the merits of the EU's auto emissions standards, they nonetheless illustrate well the difficulty of translating decarbonisation policies into tangible costs that firms can plan around. In 2013 the EU reached agreement on tightening carbon emissions standards for new vehicles sold in the EU from 130 gCO₂/km to 95 gCO₂/km in 2020-21, with significant penalties for non-compliance. Yet, despite several years of forewarning, most automakers chose to promote less efficient, but higher margin SUVs and performance cars: from 2013-2019 the share of SUVs in new EU car sales more than doubled (Cozzi and Petropoulos 2019). It was only in 2019 that many car makers seemed to realise the fines they were on track to incur (Miget 2020). In response, they lobbied to have the standards relaxed, with such calls increasing following the Covid-19 crisis (Topham and Harvey 2020).

Several factors likely contributed to this strategic error. First, the cost of the standards was not easily translatable into bottom line results. To do so, automakers would have needed to compare the potential fines for non-compliance with potential lost margins from selling more SUVs and performance cars – an exercise involving numerous material assumptions and long-term estimations. Next, management of one company could take comfort knowing most of its peers were similarly unprepared. Indeed, given executives' compensation is usually tied to the current year's share price, it would not have been enticing to them to underperform their peers by increasing capex and promoting lower-margin vehicles when others were not doing so too. Finally, the industry's subsequent lobbying efforts suggest that it may not have viewed the standards as totally credible. If so, the sector's collective failure to prepare could have further reinforced this view, since it implied the industry would have a united front in opposing the standards

If instead the standards had increased steadily at the end of each year, as well as the fines for not meeting them, a smoother trajectory might have ensued.

Further, firms wishing to preserve their competitiveness and margins may not take meaningful action unless others in the industry do so first. But if this mentality is widespread, it could create a vicious circle of inaction that delays low-carbon investments across the entire sector. That in turn could lead to a sudden price shock that results in lobbying efforts to weaken the climate policy.

In short, failure to understand the long-term implications of inaction on bottom-lines will likely result in underinvestment in low-carbon solutions and overinvestment in carbon-intensive infrastructure, increasing the risk of stranded assets (Acworth et al. 2017).

The basic premise of carbon pricing is efficiency. In fact, Article 1 of the ETS Directive states explicitly that the system's purpose is "to promote reductions of greenhouse gas emissions in a cost-effective and economically efficient manner." To truly exploit the potential efficiency of carbon pricing, though, the system's long-term signal must be clear and translatable into immediate action, even in the presence of the challenges and biases discussed above. The best way to deliver such a signal is through a credible and steadily rising carbon price. By eliminating the need to translate policies into bottom line impacts, this renders the cost of continuing to emit much more salient⁶.

Although the EU's Emissions Trading System (ETS) sets a steadily declining cap on permitted emissions, it does not provide an explicit price signal. In theory, this may not be necessary for the system to succeed. But the issues discussed above suggest that complementing the ETS's cap with an instrument guaranteeing a minimum price that rises predictably would be beneficial. Indeed, an informal survey of key ETS participants conducted for the 2020 State of the ETS Report found that 62% of respondents disagreed with the statement that the ETS's "Phase 4 parameters would lead to price patterns in line with a 2050 net zero trajectory" (including 22% who strongly disagreed, up from the 2019 report) (Marcu et al. 2020). With allowance prices having collapsed in March 2020, near-term price patterns may become even more misaligned. In short, reform could be needed to ensure companies correctly interpret the value of ambitious decarbonisation.

The carbon price needed for green hydrogen

The press recently obtained a rough draft of the Commission's Hydrogen plan, which aims to provide significant public support for green hydrogen (that made via electrolysis using renewable power) such that its cost falls roughly 3-4 times, to around €1-2 / kg. As the draft notes, this will require significant investment and large-scale deployment of green hydrogen technologies, much of which will need to come from the private sector (Simon 2020b).

However, Bloomberg NEF projects that even at the target price of €1-2 / kg for green hydrogen, it will still not be competitive in most applications absent an elevated price on carbon. For example, at €1-2 / kg, steel made with green hydrogen would require a carbon price of €50 / tCO₂e to be competitive. For cement the price per tCO₂e needed is €60. For power generation and long-distance shipping it is around €115 and €145, respectively (BNEF 2020). In contrast, the current allowance price under the EU Emissions Trading System (as of writing) was about €22 / tCO₂e, and even before the Covid-19 crisis, analysts were forecasting this price to stay within a range of €25-45 / tCO₂e through 2030 (Marcu et al. 2020).

In summary, green hydrogen's success is dependent on material private investment. But businesses will only make investments on the scale needed if they believe it will pay off. Subsidies and other policy support will help to close this gap but may not be sufficient to make green hydrogen competitive absent a rising carbon price. However, it is currently unclear if the carbon price in the EU will increase to the levels needed. Thus, even with significant public support, firms may not be willing to make the sizable investments required.

⁶ A rising price on carbon would also help with the EU's goal of a more circular economy, as production of virgin materials tends to be more carbon intensive than improving input efficiency and using recycled products. The value of such a strategy has become more evident after the Covid-19 crisis exposed some of the weaknesses in the EU's dependence on global supply chains.

Specifically, we propose that the minimum price should start close to current levels to give actors time to adjust but rise predictably and steadily each year according to a clearly defined schedule. For example, according to a study completed in the U.S. in 2014, an initial price of \$15/tCO₂e, increasing at a pace of \$10/tCO₂e each year, would have been sufficient to deliver most of the country's then-current reductions targets (Nystrom and Luckow 2014). Of course, the EU would need to undertake its own, up-to-date analysis to estimate an optimal price trajectory. It should also maintain the flexibility to revise the floor level to adapt to better information⁷ and unexpected developments. But this work should start soon, as the rate of increase will depend on when the policy is put in place – the later it is implemented the steeper the rise will need to be⁸. Indeed, given the potential of Carbon Fee and Dividend, the EU should strongly consider commissioning such a study even before it considers whether to pursue the policy⁹.

The cost of decarbonisation

Carbon pricing puts an explicit price on continued emissions, but that does not mean decarbonisation is free under alternative policies. In fact, it can often be more expensive.

Imagine an economy with two businesses: Firm A and Firm B. Each emitted 100 tCO₂ last year. The technology for decarbonizing Firm A's production process is already relatively advanced and would cost only €10/tCO₂ to implement across Firm A's entire operations. This is not the case for Firm B, for whom decarbonisation options are still early stage. It would need to spend at least €100/tCO₂ to eliminate its emissions.

Now imagine this economy has an ETS in place, which will auction 150 allowances this year. Firm A will only bid for these allowances at a price less than €10; otherwise it is cheaper for it to decarbonize. Firm B, on the other hand, will opt to buy allowances as long as their price is below €100. Because Firm A is the marginal buyer, the auction clears at €9.99, with Firm A buying 50 allowances and Firm B buying the other 100. Firm A will spend €500 to reduce its emissions from 100t to 50t and another €499.5 on allowances. Firm B will not decarbonize at all and will spend €999 at the auction. Combined, the cost to society of a 25% emissions reduction is €1,498.5.

Instead, imagine no ETS exists and the government simply demands that both firms cut their emissions by 25%. Firm A will incur costs of €250 (25t * €10) and Firm B €2,500 (25t * €100). Even though it is relatively cheap for Firm A to decarbonize, it will have no incentive to go beyond its 25% mandate. Conversely, even though it would be more efficient for Firm B to wait a few years for the cost of the technology to fall before implementing it at scale, it will be forced to do so anyway. Thus, the total cost to society for the same 25% reduction in emissions will be €2,750.

Now assume both companies pass most of their carbon costs on to consumers, whether these be the costs of implementing decarbonisation technology or of buying allowances. Not only does the first scenario result in a smaller increase in individuals' living expenses, it also generates revenues that can be returned to citizens as a dividend in order to offset that rise. In contrast, the second scenario results in higher costs and offers no direct means of supporting consumers as living costs increase.

Core Principle 2: Recycling of revenues to citizens in a fair and transparent manner

The objective of carbon pricing is environmental, not fiscal, which argues strongly for it to be revenue neutral. Much has been written on this subject, and proposals for an equal dividend paid to all citizens

⁷ This would be similar to Switzerland's carbon pricing system, which allows the government to increase the price if emissions targets are not met; a flexibility it has employed several times since the system was implemented.

⁸ That said, to the extent the price trajectory analysis recommends a range of prices, it may not be necessary to pursue the highest end of that range, given the ETS already provides a steadily declining quantitative constraint on emissions.

⁹ Through the course of our own research, as well as conversations with numerous academics and policymakers, we have yet to uncover any detailed study on the effectiveness of Carbon Fee and Dividend that was conducted specifically for the EU as a whole.

have garnered considerable support. Most notably, over 3,500 economists have signed a statement published last year in the Wall Street Journal calling for a US Carbon Fee and Dividend¹⁰, including 27 Nobel laureates, the last four former Fed chairs, and two former US Treasury secretaries¹¹ (Akerlof et al. 2019). Other options frequently discussed for revenue recycling include (i) investment in low-carbon alternatives, (ii) targeted assistance for the segments of the population most affected by climate policies or (iii) some combination of multiple approaches, one of which is often a dividend. As the High-Level Commission on Carbon Pricing concluded, the optimal choice depends on each jurisdiction's circumstances (Stiglitz and Stern 2017; IMF 2019). This should take into account political feasibility, social fairness and practicality, as well as interactions with the jurisdiction's other climate policies and objectives. In the European context, we believe that the best approach is to return the revenues collected in each member state to its citizens pro-rata as a dividend, for several reasons.

The most important consideration is political reality. Assuming firms cannot decarbonize at zero cost (because otherwise they presumably would have done so), any emissions reductions policy – whether it be explicit carbon pricing or not – is likely to increase consumer prices. This will almost certainly be unpopular. But returning the revenues generated by an explicit carbon price to citizens addresses this issue head on. While surveys indicate that certain populations are sceptical of Carbon Fee and Dividend schemes, the evidence suggests this is because they do not believe they would actually receive the dividend if the policy was enacted (many respondents state this explicitly) (Sapienza and Zingales 2013). This presents an obstacle to initial implementation, but not to maintaining the policy. Once a carbon dividend is in place, and people are actually receiving cash, their perception would change. This is what occurred in Canada when similar programs were adopted (Murray and Rivers 2015). In contrast, investing revenues in green alternatives and social programs would be less visible to citizens, and the association with carbon pricing would be less evident. Therefore, we believe a dividend is the best, and possibly only, way to maintain the support of voters for ambitious carbon pricing.

Co-benefits

Most climate change policies have synergies with numerous other EU objectives. Two examples of this are air pollution and urban transport.

Air pollution: According to the EEA, as of 2016, air pollution was responsible for about 500,000 premature deaths in the EU per year, or about 10% of the region's total annual death rate. But its effect is highly unequal – exposure to PM2.5 particles, for instance, is around 70-100% higher in countries like Poland or Bulgaria than it is in wealthier member states, such as Germany and France (and, perhaps unsurprisingly then, death rates are 20-100% higher in the former versus the latter as well). The majority of this pollution is linked to the combustion of fossil fuels, meaning incentives to cut emissions would also lower air pollution mortality and reduce inequalities (EEA 2020; European Commission 2019).

Urban transport: The negative externalities of cars include air pollution, congestion, maintenance costs, noise, accidents and several forms of environmental degradation. In direct human terms, around 25,000 Europeans are killed in car accidents each year, and many more are injured (ETSC n.d.). Indirectly, transport also contributes heavily to the deadly air pollution mentioned above, and noise is surprisingly lethal as well (Gössling et al. 2019). In addition, a significant proportion of scarce urban space is devoted to cars, a problem made even more apparent by social distancing measures during the Covid-19 pandemic (Roberts 2020). Gössling et al (2019) estimate the average cost of such externalities at €0.11 per km driven in the EU, versus net benefits from cycling and walking. Thus, investing in infrastructure for active mobility, especially in cities, presents material benefits well beyond mitigating climate change.

These examples illustrate that policies with climate benefits can also be justified for other reasons, some of which may even be more compelling. Therefore, such policies should be implemented regardless, and should not be dependent on carbon pricing.

¹⁰ That same statement also calls for steadily rising carbon price and a Border Carbon Adjustment.

¹¹ Larry Summers (Democrat) and George Shultz (Republican).

For some parts of the population, the increase in living costs due to carbon pricing can be substantial relative to their income. Independent of voter buy-in, supporting these households is necessary. Although imperfect, a pro-rata dividend is a pragmatic approach to do so, especially if complemented with other policies. Combined with a carbon fee, it ensures those with the largest carbon footprints pay more into the system, while those with below-average footprints pay less. And because carbon footprint is highly correlated with overall consumption, which is in turn highly correlated with wealth¹², Carbon Fee and Dividend is generally progressive and expected to generate net benefits for the majority of households (Boyce 2020).

Finally, carbon pricing will not operate in a vacuum. It can and must be accompanied by other policies to fund clean alternatives and provide targeted socio-economic support (Stiglitz and Stern 2017). But these should not be contingent on carbon pricing revenues.

As the Green Deal communication highlights, decarbonisation is a long-term opportunity for Europe. Future economies will be based on low-carbon products and services. Investing in them early would give the EU a valuable competitive advantage. But just as public funding for the development of the Internet was not financed through a tax on telecommunications users, investing in Europe's future low-carbon economy should not be dependent on carbon pricing revenues. Further, many such investments could be justified by their significant environmental and health benefits alone, even if climate change was not an issue. In more ways than one, investments in decarbonisation will yield returns. But not all of these long-term returns will accrue to the people whose living costs increase today as a result of carbon pricing. Therefore, funding for those investments should not be tied to carbon pricing revenues.

Similarly, broad social support mechanisms need not be tied to carbon pricing either. While it is true that climate policies will eliminate jobs in specific sectors and impose costs on certain consumers more than others, those policies are not the only cause of such issues. Automation and globalisation have also eliminated a significant number of jobs, especially those held by workers with lower levels of education. And the preponderance of people living in precarity is arguably due more to structural issues like inequality and reduced social spending than environmental policies¹³ (Vona 2019). So, although environmental policies risk exacerbating unemployment and precarity, these problems are ultimately the result of deeper structural issues. They should certainly be addressed, but they merit a much more comprehensive response than carbon pricing alone can provide.

In short, a dividend may not be the theoretically optimal approach under models used to evaluate carbon pricing in isolation. But in reality, it need not (indeed, should not) operate in a vacuum, and likely represents the best balance between practicality, fairness, and political acceptability.

Core Principle 3: A border carbon adjustment

With rising carbon prices, a decreasing ETS allowance supply and a tightening of other climate policies, there is significant concern that the EU's carbon-heavy industries will shift their operations offshore – what is known as carbon leakage. If that happens, EU workers will lose their jobs and the Green Deal will probably be blamed, seriously eroding its support. Carbon leakage would also mean emissions are not being eliminated, only moved, reducing the global impact of the EU's local efforts. To address this

¹² In France the average carbon footprint of households in the top income decile is estimated to be around 4x that of the bottom decile (Malliet 2020), while in the EU overall the ratio of the top quintile to the bottom has been estimated at roughly 5x (Sommer and Kratena 2017).

¹³ One reason climate policy may be targeted over more important structural issues is that doing so is not just in the interest of workers, but also management and capital holders, who are less disposed to protest automation, globalisation, income inequalities, etc.

risk, CCL proposes a border carbon adjustment (BCA) be put in place that ensures imports of carbon-intensive goods face a similar level of carbon pricing as comparable domestic products.

To date, the impact of carbon leakage on the EU's overall carbon footprint has been relatively low. However, this is not because it is not a serious risk, but because decarbonisation has so far been relatively cheap for most businesses; often even cost saving. But as decarbonisation costs rise, that will likely change. Already, after EUA prices increased following negotiations on ETS reforms in 2018, there was a marked increase in imported electricity from the EU's neighbours, which is significantly more carbon intensive on average than electricity produced domestically (Rosslowe et al. 2020). And as decarbonisation deepens, costs will continue to increase. For example, achieving a 20% share of variable renewables in the power mix is fairly easy because it does not seriously impinge on the system's flexibility. But getting to a 100%, or even 50% renewables share requires a complete systemic overhaul (IRENA, IEA, and REN21 2018). To pay for such extensive changes, costs for domestic producers will go up, at least at first. Unless they are protected, carbon leakage could ensue. This is especially true now, with fossil fuel prices at all-time lows and many governments elsewhere actively propping up their carbon-heavy businesses (Vivid Economics and Finance4Biodiversity 2020).

Free allowances for cement

According to the 2020 State of the ETS Report, emissions by the EU cement industry have actually increased since 2013. Despite this, the sector received more free allowances than it used in every year until 2018 – effectively giving them extra income (Marcu et al. 2020). Perhaps it was to be expected, then, that responses to the BCA consultation by cement industry representatives uniformly called for the maintenance of free allowances. See positions from [Cem'In'Eu](#), [OFICEMEN](#), [CEMBUREAU](#) and [FOEEIG](#).

That said, one could argue that carbon leakage is already addressed through free allowances. But this approach is suboptimal. Not least, because it deprives member states and their citizens of tens of billions of euros of revenues. It was assumed businesses would pass the benefit of free allowances through to consumers in the form of lower prices. But work done at the request of the Commission found that many firms have raised prices anyway, and made windfall profits as a result¹⁴ (de Bruyn et al. 2015). Further, free allowances are a confrontational solution, rather than a cooperative one, as they offer few incentives to foreign

firms to change their behaviours. In contrast, a BCA would favour the lowest-carbon producers no matter where they are located¹⁵. Foreign firms exporting to Europe could actually gain a competitive advantage by decarbonizing more quickly, which would push domestic businesses to accelerate their efforts too. So, despite some claims that a BCA is protectionist, it is in many ways fairer than the current approach. And ultimately, this competition would benefit EU consumers by minimizing price inflation as abatement costs increase.

¹⁴ Two primary reasons are given for this. First, when determining if a sector is highly exposed to international trade, it is assumed that foreign producers have the capacity to increase supply and take market share if EU producers raise prices, which is not always true, especially where a market's supply-demand balance is tight. Second, it is assumed that if one firm must increase its prices to comply with the ETS, all other firms will prefer to leave their prices constant in order to take market share. But often it is more profitable for the latter to raise their prices as well, especially in markets where price is typically determined by the highest marginal-cost producer.

¹⁵ Note that a BCA may not necessarily be required to address carbon leakage. For instance, Pollitt, Neuhoff, and Lin (2020) discuss a charge on the consumption of carbon-intensive materials like cement, steel and aluminium, wherever that consumption occurs in the value chain. This would be in addition to production-side carbon pricing, not in place of it. But because the charge is incurred at the point of consumption, and does not differentiate between production process or location, it would apply to both domestic materials and imports. Therefore, modelling exercises indicate it could effectively protect against carbon leakage without the need for a BCA.

Separately, under the current approach, EU businesses already import a significant amount of carbon without charge. This is perhaps unsurprising, as recent research has discovered that carbon-intensive upstream materials face very few trade barriers in general – in sharp contrast to “cleaner” downstream goods¹⁶, which are much more protected (Shapiro 2020)¹⁷. The EU’s gross CO₂ imports totalled 1.2 Gt in 2015 – equivalent to more than 1/3 of its territorial CO₂ emissions¹⁸ (OECD n.d.). Said another way, if these imports were a country, it would be the world’s 5th largest emitter. Imported emissions have been falling slowly in recent years, but the bloc’s net imported CO₂ was still 1/3 higher in 2017 than it was in 1990 (on a per-capita basis it was 27% higher)¹⁹ (Global Carbon Project n.d.). Such trends may have been due more to factors other than carbon leakage (e.g. lower labour and material costs in developing countries), but firms nonetheless need better incentives to limit their imports of carbon-intensive products. Until the EU addresses this, its calls on the rest of the world to decarbonize risk sounding disingenuous. In short, the EU must place much more focus on its consumption-based emissions.

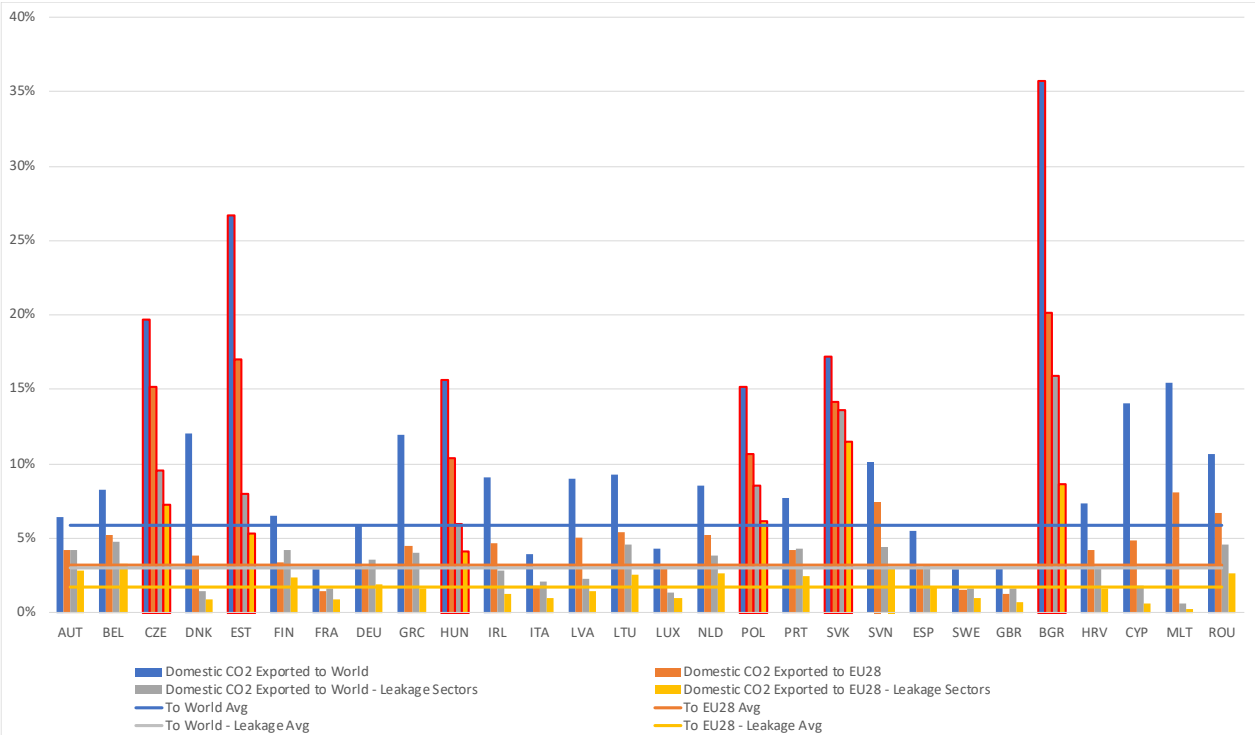


Figure 1: Domestic CO2 Emissions Embodied in Countries' Exports as a % of GDP (MtCO₂ / \$Bs)

(Blue bars show member states in top quartile for all measures of exported CO₂)

Source: OECD n.d. (calculations and sector mappings by authors) **Note:** Excludes LULUCF, non-CO₂ GHGs and non-energy industrial processes

¹⁶ Carbon intensity, measured as a percent of market value (an appropriate measure in the context of carbon pricing), is usually much higher for basic materials and intermediate inputs than for more complex manufactured goods.

¹⁷ The main explanation offered for this phenomenon is that consumers of upstream goods are usually businesses, who do not want to see their input costs rise and who can organize opposition to barriers with relative ease. On the other hand, consumers of downstream products are mainly individuals, who are unlikely to be aware of trade barriers and who would struggle to unify in opposition if they were.

¹⁸ Note, these figures include only fossil fuel related CO₂, which represents about 2/3 of total greenhouse gas emissions.

¹⁹ These figures are also limited to CO₂.

For the Green Deal to succeed, the risks of carbon leakage must be mitigated. Indeed, Poland, the last holdout on the EU Climate Law, has explicitly referred to a BCA as a necessary precondition for the EU to achieve net zero emissions (Simon 2020). This is understandable, given the EU economies most exposed to exporting carbon-intensive goods are those of the poorer member states in the East. And the customers for 71% of this exported carbon are other EU member states (OECD n.d.). In other words, the Eastern member states are the ones in the most direct competition with carbon-intensive imports for EU customers. Yet, as described above, the EU currently does little to protect the carbon-intensive upstream goods these member states produce, in sharp contrast to the significant protections offered to downstream industries, which are mainly concentrated in wealthier member states. On top of this, incentives are needed to ensure the EU's consumption-based carbon footprint decreases at a similar rate to its territorial emissions. The existing system of free allowances and state aid has not managed to achieve this to date, and it fails to meet the criterion of efficiency, as it transfers too many economic benefits to companies at the expense of consumers and public budgets.

For all these reasons, a BCA is needed. It can be designed in many ways, but it should be ambitious enough to truly tackle the issues just described, and flexible enough to adapt to efforts to evade it. And, given the growing significance of imported emissions in the EU, as well as their slower pace of decline, the BCA should also be part of a larger paradigm shift in which the EU places more emphasis on its consumption-based footprint (possibly even to the extent that an explicit consumption-based target is included under the European Climate Law).

Core Principle 4: Simplicity

One of the keys to a policy's efficiency is simplicity. Indeed, one of the pillars of the OECD's FASTER principles for successful carbon pricing is that it should be clear in design and implementation (OECD and World Bank 2015). This reduces administrative burdens, makes compliance obligations clearer for those it covers, and renders the policy more transparent and credible. In the EU, climate objectives are targeted via several different policy packages, which overlap to varying degrees. This is not necessarily a problem given the need for complementary policies described above. But it is still not clear that all of these policies are entirely additive, and do not detract from the effectiveness of others (Marcu et al. 2020). In a theoretical world, it would be best to redesign the EU's approach periodically from the ground up to account for new information and ideas, but this would obviously require more time and energy than is available in reality. Still, it is important to maintain a vision of simplicity and attempt to move towards it over time as climate policies are expanded and revised. This vision should also take into account the full universe of policies, rather than considering each of them in isolation. Such simplification would lower administrative expenses and make compliance less costly within the EU. And such simplification would increase the EU's leadership capacity by making it easier for other regions to replicate its approach (especially those that lack the resources and strong institutions necessary to implement complicated programmes).

With regards to carbon pricing, simplicity means a harmonized price across as many emissions sources as possible. Fossil fuels are responsible for around $\frac{2}{3}$ of total greenhouse gas emissions, and the simplest way to capture them in a carbon pricing system would be to charge the applicable price fully upstream – at the point of extraction (“at the wellhead”) or at the moment of importation (e.g. where a tanker unloads its cargo). Absent this, charging the most upstream users of those fossil fuels, as is generally the case under the ETS, is the next best option. However, it still creates some difficulties. For instance, the expansion of the Energy Taxation Directive (ETD) to cover a broader set of fuels may be restrained by concerns over potential double counting for ETS installations²⁰.

²⁰ This issue partly stems from the fact that the ETS's taxes are production-based and focused specifically on emissions, whereas the ETD is consumption-oriented and concentrates on energy use in general. Note also that

In summary, although it will take time to achieve, and may still require some targeted exceptions (provided they are well justified), moving towards a harmonized price on all major emissions sources, ideally charged fully upstream wherever it is practical to do so, should be an explicit objective guiding policy discussions.

4. Key EU policies considered

The EU approaches its climate change objectives through an array of partially overlapping policies. These are tied together by the 2030 Climate and Energy Framework (the 2030 Framework), which sets the target of an EU-level reduction in territorial emissions of 40% by 2030 (versus 1990). This will likely be superseded by the new European Climate Law (the Climate Law) being negotiated at the time of writing. The Climate Law would establish a binding, EU-level net zero target for 2050. It would also likely increase the 2030 objective to at least 50-55%.

In addition to the 2030 Framework and the Climate Law, three other policies are particularly relevant for illustrating how the CCL principles could work in the EU's regulatory landscape:

- **The Emissions Trading System (ETS):** The ETS applies to emissions generated within the EU by mostly stationary installations²¹ for specific activities – mainly heat and power generation and industrial applications. At present, it covers around half of the EU's territorial emissions. Covered installations are required to track and report their emissions, and to surrender a corresponding number of emissions permits, otherwise referred to as EU allowances (EUAs). EUAs can be acquired in three ways: (i) By purchasing them in regular auctions run by the EU or the member states; (ii) By free allocation for installations in sectors considered highly exposed to carbon leakage²²; or (iii) by purchasing EUAs on the secondary markets. Each member state is allocated a share of the EU's total EUA supply – based largely on its historical emissions profile – and is entitled to all of the net revenues from the auctioning of these EUAs. Member states should spend at least 50% of these revenues on climate-related programs, but otherwise few restrictions are placed on the revenues' use. Member states are also permitted to spend the revenues as state aid to offset up to 75% of the indirect costs of the ETS (e.g. higher heat and power prices) for businesses downstream in the value chain, subject to EU approval of a plan for doing so. The cap on the EUA supply is reduced linearly each year at a rate of 1.74% (versus the base year), which will accelerate to 2.2% for 2021-2030. In addition, if the amount of EUAs still in circulation (i.e. not surrendered) exceeds a certain threshold in a given year, then EUAs that would have otherwise been auctioned the following year will instead be put into a Market Stability Reserve (MSR) up the amount of such excess. Should this trend reverse substantially in later years, the EUAs in the MSR can be released to avoid a shortfall. Starting in 2023, though, EUAs in the MSR that are in excess of the previous year's auction volumes will be cancelled permanently.

the minimum excise taxes in the ETD were set in the context of multiple environmental objectives (e.g. clean air), not just climate change.

²¹ Domestic aviation strictly within Europe's borders is also covered by the ETS but is treated differently from other installations in several respects.

²² For each of these sectors, the EU maintains a "best-in-class" benchmark of emissions-per-unit-produced, generally estimated based on the 10% most efficient installations in a given sector at a certain point in time. Over the course of each ETS phase this benchmark steps down at a linear rate in line with the cap on the overall EUA supply. Free EUAs are allocated based on this benchmark and an installation's historical production levels. Less efficient installations therefore need to purchase additional EUAs. This is slightly different for the aviation sector, where 82% of EUAs are allocated for free based on historical emissions (and a further 3% can be allocated freely to new entrants).

- The Effort Sharing Regulation (ESR):** The ESR sets binding targets for the reduction of all greenhouse gas emissions not subject to the ETS. The two policies are thus closely linked. In fact, the first step in agreeing the ESR obligations was to determine how to split the burden of achieving the 2030 Framework's reduction target between the ETS and non-ETS sectors overall. Under the 2030 Framework, ETS sectors are to reduce their emissions by 43% relative to 2005, while the non-ETS (i.e. ESR) reduction target is set at 30%. The higher goal attributed to the ETS was based on the assumption that ETS sectors would be able to reduce emissions more efficiently. With regards to the ESR, the "effort" required to meet the EU-level target of a 30% emissions reduction is not "shared" equally by all member states: each member state was given an individual reduction objective – based mainly on its GDP per capita – ranging from 0% (i.e. flat) to 40%. Member state reduction objectives are then converted into Annual Emissions Allocations (AEAs), which set a limit on the amount of emissions a member state can generate each year in the non-ETS sectors, and which are reduced linearly each year so as to arrive at the member state's targeted emissions level in 2030. It is entirely up to each member state to determine how it will remain under its AEA cap each year. But, should it exceed the cap in one year, it is penalized with an additional 8% reduction in its AEA the following year. However, the ESR includes a number of provisions to allow member states some flexibility in meeting their caps. In particular, should a member state remain under its AEA cap, it can sell its excess AEAs to member states who are in deficit²³. Note that this feature, together with the ESR's heterogeneous targets, effectively introduces an implied inter-member state redistribution mechanism.
- The Energy Taxation Directive (ETD):** The ETD pre-dates the ETS and the ESR, though it was negotiated around the time that ETS was being developed. Finalised in 2003, it sets minimum excise tax levels for specific energy sources (essentially motor and heating fuels and electricity). The idea behind the ETD is that, because these fuels are typically "transportable," minimum tax levels needed to be specified to allow member states to charge for their use without risk of tax competition from neighbouring countries within the single market. A primary (if not the only) motivation for such taxes is environmental protection, although this extends beyond climate change to other issues (e.g. local air pollution). Indeed, the ETD minimums are not based explicitly on a fuel's carbon content, but rather on the volume consumed²⁴. The level set for electricity, for instance, is the same whether it is generated using coal, gas or clean renewables. The ETD complements the ETS in the sense that the ETS generally applies to emissions produced by "stationary" installations, while the ETD applies mostly to consumption of "transportable" fuels. Where the two policies do occasionally overlap, they are not always consistent²⁵. This is not entirely illogical given the original intentions of each policy were different. But in the context of the Green Deal, such inconsistencies should now be revisited.

²³ For example, it may cost significantly more for a member state with a target at 40% to meet its obligations than it would for another member state with a target at 0% to exceed its objective. In this case, the latter can reduce its emissions slightly at low cost and sell its excess AEA capacity to the former at a higher price, effectively transferring wealth between the two member states.

²⁴ The ETD minimums vary materially according to the type of fuel and its consumer. For instance, the minimum tax on petrol for individual motor vehicles is set at a level equivalent to around €150/tCO₂, while that for natural gas consumed by businesses equates to only about €2-3/tCO₂.

²⁵ The ETS is based on production, the ETD on consumption; the ETS charges are based on emissions, the ETD charges for consumption; the ETS is a firm obligation, the ETD merely sets minimum tax levels; the ETS applies specifically to businesses; the ETD applies to everyone and, in fact, allows for exemptions to businesses; etc.

5. What the CCL core principles could look like in EU policy

CCL is active at both the EU level and within the member states. Our primary objective is an EU-wide implementation of Carbon Fee and Dividend, as this would obviously be most impactful. In addition, certain elements of the CCL proposal, particularly the BCA, can only be effectively implemented at the EU level. However, some member states are evaluating national-level policies resembling Carbon Fee and Dividend as well. CCL is supportive of these efforts, but only as temporary measures until an EU-level policy can be agreed, and certainly not as prerequisite for EU-level action. Moreover, the introduction of several, heterogeneous national-level policies could make it more difficult to create an eventual EU-level policy. Therefore, it is important for EU policymakers to begin considering now how an EU-wide Carbon Fee and Dividend would be designed and to start engaging with any member states developing national-level carbon pricing to ensure the two policy levels will not conflict.

To assist in such discussions, below are several implementation options that demonstrate pathways Europe could take to better integrate CCL's principles under existing EU-wide frameworks. Although these all deviate to some degree from the main CCL proposal, each of them generally satisfies its core principles. These are likely not the only options for implementing CCL's recommendations, but they serve to illustrate that it is possible to do so under existing EU policies.

Option 1: Repurpose the ETD as an economy-wide carbon price

This approach would extend the ETD to cover all uses of fossil fuels and revise its methodology such that the minimum tax levels are based explicitly on its carbon content. Following such a reform, the ETD would effectively provide an explicit carbon price.

- **ETD Modifications:** The ETD would be extended to apply to all uses of fossil fuels. The minimum fee levels would be based first on a fuel's carbon content and would rise steadily each year at a predictable rate. Other "externality add-ons" could be applied to individual fuels to address their other environmental costs beyond climate change (e.g. air pollution from transport). Ideally the new policy would require that fees be charged at the point of extraction, rather than the point of consumption. Revenues obtained from these fees would be returned to citizens as a carbon dividend. As noted above, flexibility should be built in allowing the fee level to be adapted to new information and circumstances where there is a clear need to do so²⁶.
- **ETS Modifications:** In some cases, ETS installations may be charged twice under this system (e.g. power generation from fossil fuels). To address this, ETS installations would be allowed to request a refund for ETD expenses paid, under a similar process to that used by firms to request a VAT reimbursement. This refund should be limited to the cost of the EUAs surrendered that year to ensure the ETD sets a minimum price on carbon²⁷. A floor price under the ETS, as described in Option 2, should be considered, to ensure a rising price for non-fossil fuel emissions as well. This floor price would be set equal to the minimum ETD fee level. Finally, the ETS would be expanded to other sectors (e.g. maritime shipping, road transport, etc.) already under discussion so that (i) these sectors are subject to both the rising carbon price and the declining cap on emissions and (ii) the number of abatement channels under the ETS is increased.

²⁶ For instance, if the BCA charge is tied to the ETD fee level as suggested here, and EUA prices rise significantly above that level, it may need to be revised upward to ensure the BCA remains effective.

²⁷ For example: Imagine the EUA price is €30/tCO₂ and the ETD minimum is set at €25/tCO₂. For each tCO₂ it emits, a coal power plant would need to pay a €25 fee under the ETD and purchase an EUA (for €30) under the ETS. It could then request a refund of €25 per tCO₂ emitted. But if the EUA price remains at €30 after the ETD minimum steps up to €35, the generator can only request a refund up to €30 per tCO₂. The coal plant's refund requests would need to be accompanied by appropriate documentation of the price it paid to acquire the EUAs it surrendered and the ETD costs it incurred.

- **ESR Modifications:** The changes above may allow for limiting the ESR's scope. However, this could eliminate the implied redistribution aspect of the policy described above. If so, it may be necessary to introduce more explicit measures (such as greater contributions to the EU's cohesion and solidarity funds).
- **BCA Design:** A BCA would be introduced, and the price charged to importers under the BCA would be tied to the minimum fee level under the ETD²⁸. Because the ETD would set a minimum price on carbon applying to all sectors, using that price would ensure the BCA does not unfairly charge importers more than domestic firms. Indeed, researchers at WIFO present arguments for why such an approach would help ensure the BCA is WTO compatible²⁹ (Krenek, Sommer, and Schratzenstaller 2020). The BCA would also allow for the elimination of free allowances and state aid. Initially, it would target only the sectors most at risk for carbon leakage, but flexibility would be built in so that it can be adapted to future circumstances, as well as efforts to evade it. In order to make it appropriately ambitious, the BCA would apply a default "carbon content" assumption that is not overly generous, such as a benchmark value based on the 10% least-efficient EU installations. But this would need to be paired with a provision allowing importers to override the default by providing actual emissions data for their goods (subject to adequate documentation). Finally, to ensure fair treatment under such an approach, the parameters used to set BCA charges (e.g. carbon content benchmarks) would be developed by an independent agency in which various stakeholders could participate, including the WTO.

Another variant of this option would be to limit the extension of the ETD mainly to fuels used outside of ETS installations, such that all fossil fuels are covered by at least one of the two policies, but with less overlap. In this variant, an ETS floor price linked to the ETD minimum fee levels would be necessary. Such an approach would also require defining the split between which emissions sources should primarily fall under each policy. At the same time, however, it would reduce the need for businesses to seek refunds due to smaller ETS-ETD overlap.

One interesting aspect of this option is that aligning the ETD's minimum fee levels with specific environmental targets allows one to argue that the revised policy would not be "primarily of a fiscal nature." This argument would be further strengthened by requiring member states to return the revenues to citizens as a dividend (instead of paying them into public budgets). It is therefore possible to argue that these revisions would not require unanimity to pass.

Option 2: Introduce a floor to the ETS and gradually extend it to all major sectors

Option 2 makes the ETS the focus of carbon pricing and aims to phase the ETD out over time. It would introduce a price floor to the ETS, while leaving the ETD largely unchanged. However, once the EUA price exceeds the minimum tax level for a given fuel under the ETD, the ETS would be expanded to cover that fuel, and it would be removed from the ETD.

- **ETD Modifications:** Reforms to the ETD would be limited. For instance, greater differentiation should be introduced for fuels based on their carbon content (at the very least, the charges for electricity produced with renewables should be reduced), the minimum fee levels could be updated (most are outdated and have not kept pace with inflation) and coverage of additional fuels could be considered. The most significant revision, however, would be the "ETS shifting mechanism" described below. To enable this mechanism, ETD minimums would now be expressed in terms of tCO₂e instead of volumes (although the effective fee per unit of volume would not necessarily need to change in most cases).

²⁸ Administering the BCA would be a competency of the EU, arguing for the revenues to be paid into the EU budget.

²⁹ They also propose that such a BCA would be an appropriate and efficient source of EU own resources.

- **ETS Modifications:** A floor price would be introduced to the ETS, which rises steadily at a predictable rate each year (again, with some built in flexibility to adapt it to new information and developments). This would be realised through an auction reserve price, which must be met for an auction sale to be completed. Unsold EUAs would be placed in the MSR or a similar reserve. Auction revenues up to the floor price for EUAs allocated to a given member state would be returned to its citizens as a carbon dividend. But where the auction price exceeds the floor, the additional revenues would be used as they are today³⁰. As in Option 1, the ETS would be expanded to additional sectors already being discussed. In addition, though, it would also be gradually expanded to users of fuels that are currently excluded from ETS coverage, but which do fall under the ETD. This would occur whenever either (i) the ETS floor price exceeds the ETD minimum for that fuel, or (ii) the ETS spot price exceeds the ETD minimum for that fuel for a period of [12] consecutive months. After expansion of the ETS to a new fuel takes place, the ETD would no longer apply to that fuel.
- **ESR Modifications:** As in Option 1, the changes above may allow for limiting the ESR's scope. Again, this may necessitate more explicit redistribution measures.
- **BCA Design:** As in Option 1, an ambitious BCA would be introduced, and free allowances and state aid eliminated. Here, however, the BCA price would be tied to the ETS floor price.

One of the main benefits of this approach is the gradual introduction of a single, harmonized pricing mechanism for most of the EU's emissions, eventually allowing for the phase out of the ETD entirely. The switching process would not always be simple but, given the predictability of the floor price relative to the ETD minimums (and the lag on the spot price switching trigger), switching by fuel would happen in a predictable sequence, so planning for this could begin now.

Option 3: Allow for 2-way conversion (i.e. fungibility) between EUAs (ETS) and AEs (ESR)

This option also seeks a harmonized emissions price by enhancing the interaction permitted between the ETS and the ESR. At a high level, it would allow member states to supplement their AEs using EUAs, and to convert excess AEs into EUAs.

- **ETD Modifications:** Only the more modest reforms described in Option 2 (such as lowering charges on electricity generated with renewables, etc.) would be needed. It may eventually be possible to phase out the ETD if it becomes less relevant as a result of the other modifications proposed.
- **ETS Modifications:** As in the options above, a floor price would be introduced using an auction reserve price, with auction revenues up to the floor price distributed as a dividend. As also described above, the ETS would be extended to the new sectors already under discussion. But the ETS may be expanded further if conversions between AEs and EUAs are high (see below), as doing so would serve to harmonize the carbon price across the EU and increase the revenues available to pay the dividend.
- **ESR Modifications:** Additional flexibility would be added to the ESR allowing member states to use EUAs to supplement their AEs. For this purpose, member states could either withhold their allocation of EUAs from auction or purchase additional EUAs in the secondary market. In a departure from the current ESR, this flexibility would not be capped (or the cap would be significantly raised) and the option would be open to all member states. Similarly, member states with excess AEs would be able to convert them into EUAs, which they could sell at auction or in secondary markets. Thus, a degree of fungibility between the ETS and the ESR would be introduced. Such fungibility would likely alter the redistributive effects of the ESR, though, which would need to be addressed, either via a re-negotiation of ESR targets or through more explicit measures.

³⁰ Alternatively, to preserve existing member state budgets, this approach could be reversed. In other words, revenues up to the levels collected today could be used as they are now, and anything in excess of those revenues would be used for a dividend. This is less in line with the CCL principles, but possibly easier to achieve politically.

- **BCA Design:** As in the other options, an ambitious BCA would be introduced, with its fee level tied to the ETS floor price.

The goal of this approach is to increase fungibility between EUAs and AEAs with the ultimate objective of moving towards a single price for most emissions. The flexibility provided through this approach also helps ensure that member states with the most stringent ESR targets do not face especially out-sized costs relative to the rest of the EU (under the assumption that, beyond a certain level, each percentage point increase in the ESR target becomes more difficult to achieve). At the same time, it makes it easier for member states with surplus capacity under the ESR to monetize their excess AEAs.

Acknowledgements

We are grateful to the many CCL volunteers, politicians, academics and members of civil society whose ideas and comments helped shape this policy brief. In particular, we would like to thank Alexander Krenek, Karsten Neuhoff, and Michael Pahle for feedback on an earlier version of this document.

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