Working paper 90

EU Climate Policy and Competitiveness: How the EU can strengthen competitiveness by reforming climate policy

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03.02.2026

This article identifies key reform opportunities for the ETS and other EU climate-related policies. It argues that by streamlining the ETS and removing redundant regulatory measures, the EU can minimise the economic costs of the green transition, improve the efficiency and market orientation of EU climate policy, and strengthen productivity.

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Abstract

EU climate policies should be pursued as cost-efficiently as possible. Costly measures make the green transition less likely to succeed in the long run and unnecessarily reduce EU competitiveness. Even while observing the subsidiarity principle, the global externality of climate change leaves ample room for policy action at the EU level. In fact, the EU possesses by far the most efficient instrument for climate policy: the EU Emissions Trading System (ETS). This article identifies key reform opportunities for the ETS and other EU climate-related policies. It argues that by streamlining the ETS and removing redundant regulatory measures, the EU can minimise the economic costs of the green transition, improve the efficiency and market orientation of EU climate policy, and strengthen productivity.

Introduction: Cost-efficient climate policy

The Draghi Report identifies decarbonisation as one of three areas of action necessary to reignite growth in the European Union (Draghi, 2024a, 2024b). In this article we outline how climate policies in the EU can be reformed to strengthen the Union's competitiveness. However, the primary objective of climate policies should not be to achieve competitiveness. Rather, the primary objective should be to address the market failure associated with greenhouse gas (GHG) emissions.

Effective climate policies will increase the cost of GHG emissions, thereby increasing the cost of energy use. This will redirect energy production from fossil fuels to renewables. If renewable energy were cheaper than fossil energy, the green transition would be achieved without political interference. This is not the case, which implies that the green transition necessarily comes at a cost. The direct cost to businesses and households might be reduced, of course, by subsidising green energy, but only at an even higher cost of taxation necessary to finance subsidies.

That does not mean that competitiveness is irrelevant in the context of climate policies. Cost-efficient measures ensure that the green transition is realised as inexpensively as possible. More expensive measures increase costs and weaken EU competitiveness even further. GHG emissions are a negative externality because the actions of one emitter affect the world negatively as a whole. Economic theory suggests that externalities are most efficiently addressed through pricing. Ideally, the price of GHG emissions would reflect the global marginal damage caused. This would be the most cost-efficient path to reduce emissions, as it would maximise global welfare. This is a well-established result in economic theory (Mankiw, 2009; Nordhaus, 2013; Tirole, 2017). A uniform price ensures that the cheapest reductions are implemented. The reason for this is described in Box 1.

Box 1. Marginal abatement cost curve

Figure B.1.depicts the marginal abatement cost (MAC) curve. The horizontal axis is the amount of abatement, and the vertical axis is the price in euros per tonne of CO_2 equivalents (CO_2e) of marginal abatement. The curve thus represents the abatement cost per tonne of CO_2e.

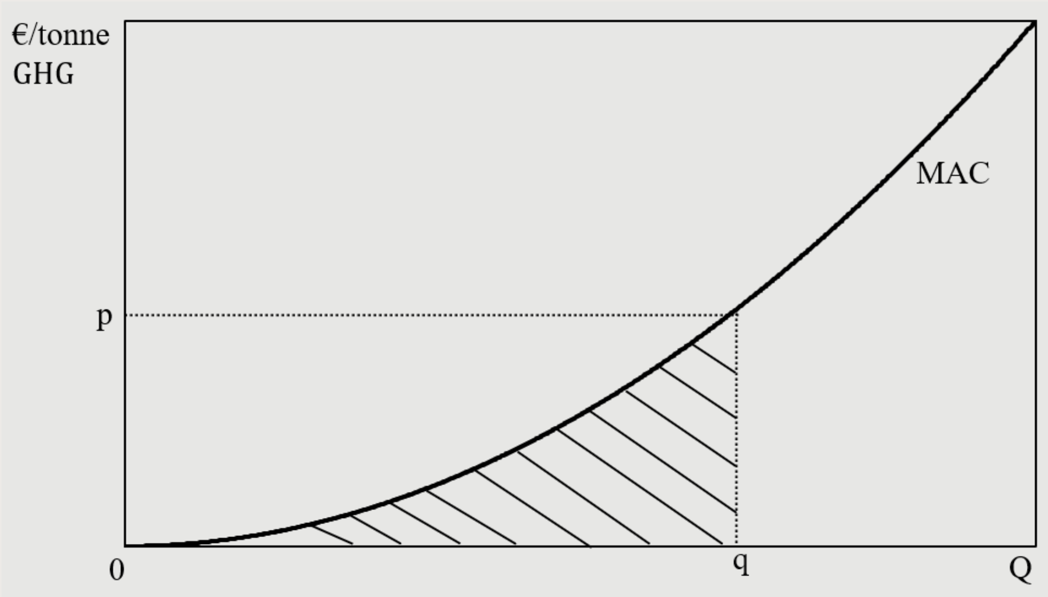
The marginal cost of reducing GHG emissions is increasing. This reflects the fact that the initial emissions reductions are relatively inexpensive, for example due to increased energy efficiency, but the cost increases as the cheapest reductions are exhausted. Further reductions may necessitate more expensive savings and technologies, such as carbon capture and storage (CCS).

Introducing a price on GHG emissions, for example through a carbon tax, implies that reductions up to the level q are realised. For any abatement level to the left of q, the marginal cost of abatement is below the carbon tax. Therefore, it is cheaper to reduce emissions than to pay the carbon tax. The emitter will therefore reduce the emissions. However, for any level to the right of q, the marginal cost exceeds the carbon tax, meaning that paying the tax is cheaper than further abatement.

For this reason, setting a uniform price on GHG emissions will ensure that the cheapest reductions are implemented and that the cost of reducing emissions does not exceed the cost of the carbon tax.

Furthermore, a uniform tax minimises the information needed by regulating authorities. If they had to regulate reductions directly, they would have to identify specific costs of potentially all reduction possibilities to maintain cost-efficiency.

Figure B.1. The MAC curve



Although there is broad consensus that GHG emissions should be priced uniformly across sectors, countries, and uses, there is less agreement on the level at which the price of CO_2 equivalents (CO_2e) should be set. Estimating the price corresponding to the global marginal damage, also known as the social cost of carbon (SCC), requires comprehensive information about, and projections of, the scope of climate damages and mitigation costs. Consequently, estimations of the SCC are naturally subject to considerable uncertainty. However, estimates indicate that the SCC is in the range of €60–€150 per tonne of CO_2e (Barrage & Nordhaus, 2024).

This article does not seek to determine the optimal level of SCC, but rather to illustrate how the EU can most cost-efficiently achieve its stated climate targets. It is obvious that climate change is a global issue. According to the Tiebout mechanism, political issues should be addressed by the level of government best equipped to handle them in the most decentralised manner possible (Tiebout, 1956). In the absence of a uniform global tax on GHG emissions, the next best alternative for the EU is to impose a uniform price across Member States. It follows from the fundamental insight from economic theory that the most cost-effective way to achieve *any* given target is to set a uniform price consistent with reaching that target.

One way to price GHG emissions is through a Pigouvian tax, which is a tax on market activities that generate negative externalities (Pigou, 1920).

An alternative to taxes is a cap-and-trade scheme. In such a scheme, there is a cap on GHG emissions, which is set by the authorities. Often this cap decreases over time. To emit GHG within the scheme, companies must surrender allowances. These allowances can be traded on a market. As the supply is usually fixed by the cap each year, the price depends on the demand for allowances. One benefit of a cap-and-trade scheme is that it prices all emissions uniformly, which ensures cost-efficient emission reductions. As the emissions cap is fixed rather than the price being fixed, it is more difficult to align the CO_2e price with the global marginal damage cost. Through a CO_2e tax the rate can be set exactly equal to the global marginal damage cost. In a cap-and-trade scheme the supply of allowances is fixed, which means that the price depends on the demand. In such a scheme it is thus very difficult to reach a specific price, while at the same time reductions are fixed by the number of allowances issued.

However, given that international agreements within the Paris Accord framework fix the emissions by each participant, based on unilateral commitments, it makes sense for the EU to fix emissions rather than the price (the first best solution still being an international agreement on a price equal to damage costs rather than on geographical emissions). Thus, a cap-and-trade scheme is a cost-efficient instrument in the given international environment.

There is, nevertheless, scope for reforming EU climate policy substantially to minimise the cost of achieving climate targets. In such a policy, a cap-and-trade-scheme would play a vital role, while regulations such as bans, standards, reporting requirements, and state aid would be abolished, since they do not in themselves contribute cost-efficiently to the achievement of the EU's climate targets and furthermore imply inefficient double regulation of emissions already addressed with superior instruments.

While energy and climate policy issues are linked, the present article does not discuss the Draghi Report's suggestions for the energy markets, as these are covered in Stagnaro (2025) and Stagnaro's contribution to this volume. The structure of the article is as follows: first, it describes how an efficient cap-and-trade scheme works and why various overlapping regulations do not promote the green transition; then, it explains how a cost-efficient climate policy could be designed in the EU. Finally, it presents a brief overview of the proposed reform.

The EU is a vital player in solving the climate issue

European cooperation, coupled with the EU's access to cost-efficient measures such as a cap-and-trade scheme, establishes it as a key player in climate policy. This is reflected in the EU's participation in the Paris Agreement on behalf of its Member States and in the set of ambitious climate targets set by the EU in 2021. One ambition is to reduce EU emissions by at least 55% by 2030, relative to 1990 levels.[1] The EU is on course to meet this target, as GHG emissions are projected to decrease by 54% by 2030 based on existing policies and measures, as well as on those planned but yet to be introduced (European Commission, 2025). In the longer term the EU aims to achieve climate neutrality – that is, net zero – by 2050. Several provisions have been introduced to meet these targets.

The foundation of EU climate policy

In 2005,[2] the EU introduced the world's first international Emissions Trading System (ETS), which today covers GHG emissions from the electricity and heat generation, energy-intensive industry, aviation within the European Economic Area (EEA), and maritime transport sectors.[3] In 2023, a new emissions trading system, the ETS2, separate from the EU ETS, was created. The ETS2 covers CO_2 emissions from fuel combustion in buildings and road transport, as well as additional sectors, which are mainly small industries not covered by the existing EU ETS.[4] The ETS2 is planned to be fully operational from 2027. This implies that almost 80% of the EU's net emissions will be covered by an ETS (Klimarådet, 2025).

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1 https://consilium.europa.eu/en/policies/fit-for-55/.

2 https://climate.ec.europa.eu/eu-action/eu-emissions-trading-system-eu-ets/development-eu-ets-2005-2020_en.

3 https://climate.ec.europa.eu/eu-action/eu-emissions-trading-system-eu-ets/scope-eu-ets_en.

4 https://climate.ec.europa.eu/eu-action/eu-emissions-trading-system-eu-ets/ets2-buildings-road-transport-and-additional-sectors_en.

Emissions from several sectors will not be covered by an ETS prior to 2027. To ensure GHG reductions in Member States, the EU initially adopted the Effort Sharing Regulation (ESR) in 2018.[5] The ESR set national reduction targets for GHG emissions by 2030 in the following sectors: domestic transport (excluding aviation), buildings, agriculture, small industry, and waste. In addition to the ETS and ESR, the EU has also introduced the Land Use, Land-Use Change and Forestry Regulation (LULUCF). The land use sector covers the management of cropland, grassland, wetlands, forests, and settlements, as well as changes in land use including land afforestation, deforestation, and the draining of peatlands. The land use sector thus offers both carbon sequestration and emission reduction opportunities. The LULUCF sets, among other things, net carbon removal targets for the land use sector. Member States must ensure that their national plans are aligned with these targets.[6]

Thus, the ETS, the ESR, and the LULUCF cover virtually all EU GHG emissions. From 2027, when the ETS2 becomes operational, to 2030, the target year for the ESR, there will be substantial overlap in the emissions covered by the two regulations. Almost all emissions covered by the ESR, except those from animal and plant production in agriculture, will be covered by the ETS2. This constitutes inefficient double regulation. Companies with activities covered by the ETS2 must pay for allowances to emit GHG, while the same emissions are regulated nationally, for example through a carbon tax. In this case, the company would pay both for allowances and a carbon tax for the same GHG emissions, but this would not actually influence total EU emissions. Figure 1 explains why this is the case.

Furthermore, the ESR is not in itself efficient, since it implies uneven abatement cost across countries and between the ETS and non-ETS sectors. In principle, ESR commitments can be traded between countries, which would tend to make abatement costs more even, but so far,

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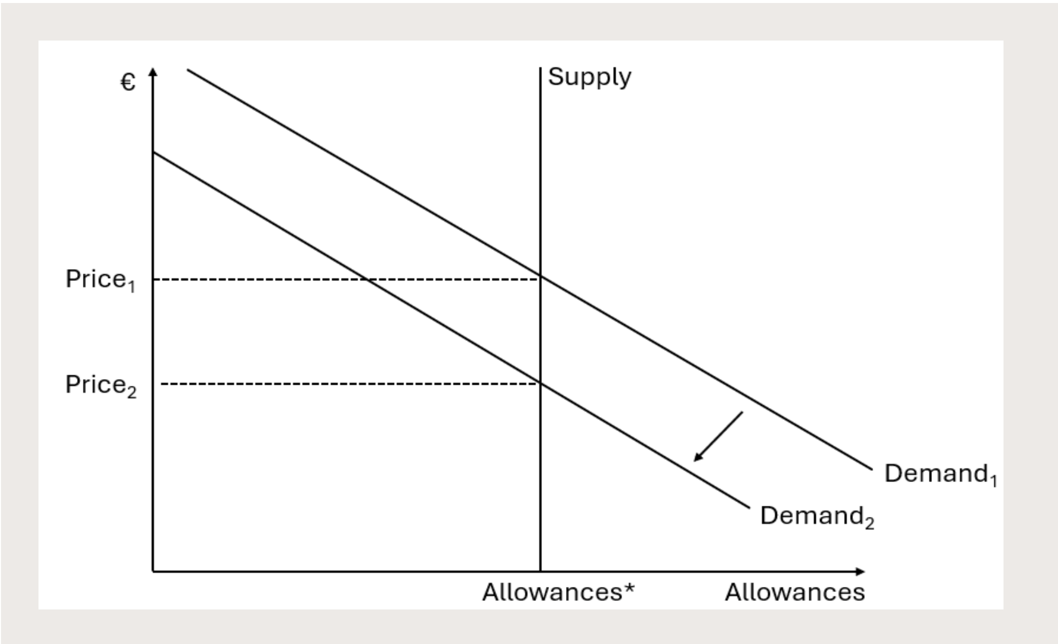
[5] https://climate.ec.europa.eu/eu-action/effort-sharing-member-states-emission-targets/effort-sharing-2021-2030-targets-and-flexibilities_en.

[6] https://climate.ec.europa.eu/eu-action/land-use-sector_en#what-is-the-land-use-land-use-change-and-forestry-regulation-lulucf.

such a market has not been established. In addition to the ETS, ETS2, ESR, and LULUCF, there is a significant amount of command and control climate regulation. However, more regulation does not necessarily imply greater reductions in global GHG emissions. Figure 1 illustrates the framework of an ETS and explains why this is the case.

Figure 1. The ETS framework



Note: This figure is purely illustrative. There is an exception to this mechanism, because of market stability reserve.
Source: Authors' illustration

In the ETS, one allowance permits a company to emit one tonne of GHG. The EU determines the cap on emissions, that is, the supply of allowances. As Figure 1 shows, since the supply is fixed, the demand determines the price of emissions within the ETS.

This implies that a shift in demand, for example from Demand_1 to Demand_2, does not affect total GHG emissions within the ETS. The shift only affects the price of allowances. Although this may seem trivial in Figure 1, it is a crucial property of a cap-and-trade scheme. Total emissions are fixed by the cap, while the price of emissions is uniform across covered sectors and countries at any given time. The system is therefore well suited to reach certain climate targets at a given time.

Figure 1 shows a fully efficient ETS with a 100% internal carbon leakage rate. This is also described as the 'waterbed effect'. For example, government intervention that reduces emissions in one sector covered by the ETS will not affect total ETS emissions as the reduced emissions 'pop up' in another sector. Several examples of this waterbed effect are described below. However, this does not entirely hold true, as the carbon leakage rate can be greater than or less than 100% in the EU ETS. Why this does not change the conclusions in the following is described in the later sections.

Bans, emissions standards, sustainable reporting, and sector-specific targets do not contribute to the net-zero target

The cap implies that regulations outside the scope of the ETS, which cover sectors within the ETS, are limited in terms of the total GHG emissions they can affect. One example of such regulation is the ban on new internal combustion engines (ICEs) by 2035.[7] As described above, the ETS2 will cover CO_2 emissions from fuel combustion in road transport. The purpose of the ICE ban is to reduce GHG emissions from road transport. This will likely reduce demand for fuels for road transport, and thus the demand for allowances in the ETS2. As Figure 1 illustrates, the implication of the ban is that the allowance price in the ETS2 decreases, while total GHG emissions in the ETS2 remain unaffected. In other words, a ban on ICEs is not likely to reduce total EU GHG emissions.

In addition to the ban on ICEs, current climate regulations in the EU are extensive. While this article does not intend to list all regulations, the following highlights several that do not promote cost-efficient climate policy. On the path to the ban on ICEs in 2035, CO_2 emissions standards have been set for new cars, vans, and heavy-duty vehicles.[8] These target levels are decreasing up to 2035. The intention of the regulation is to reduce emissions from the road transport sector.

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[7] https://climate.ec.europa.eu/eu-action/transport-decarbonisation/road-transport/light-duty-vehicles_en.

[8] https://climate.ec.europa.eu/eu-action/transport-decarbonisation/road-transport_en.

While this intention seems to be in accordance with the EU's overarching climate target, this does not result in fewer GHG emissions from the EU.

The reason for this is the same as described above. CO_2 emissions target levels for road transport will reduce demand for allowances in the ETS2, which covers fuel for road transport. This reduction in demand from this one sector will not affect the emissions cap. However, it will now be cheaper to emit GHG in the remaining sectors covered by the ETS2. In the new equilibrium, the total emissions remain unchanged from the CO_2 emissions target levels. If the target levels accelerate the green transition of the transport fleet, the regulation will be costly; otherwise, the transition would occur organically through the ETS2. Command and control measures are thus an inefficient form of climate policy.

The EU uses many tools to reach its climate targets. The Corporate Sustainability Reporting Directive (CSRD) requires large companies to publish reports on the social and environmental risks they face and the impact of their activities on the environment.[9] Despite simplification efforts,[10] the CSRD is far from an efficient tool for the EU to reach its climate targets. First and foremost, the CSRD does not affect the cap in the ETS. This means that total emissions remain unaffected by reporting requirements for businesses. While the potential for climate action through the CSRD seems very limited, the reporting requirements are extremely costly for businesses and impair competitiveness. One argument in favour of the CSRD is that it provides consumers with knowledge on sustainability. Consumers may prefer companies that report on sustainability. However, the fact that regulation was deemed necessary to induce reporting implies that the market is not willing to pay the actual price for this information. Therefore, the CSRD does not qualify as a cost-efficient measure for the EU to reach its climate goals.

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[9] https://finance.ec.europa.eu/capital-markets-union-and-financial-markets/company-reporting-and-auditing/company-reporting/corporate-sustainability-reporting_en.

[10] https://finance.ec.europa.eu/publications/commission-simplifies-rules-sustainability-and-eu-investments-delivering-over-eu6-billion_en.

Another tool in the EU's climate policy toolbox is environmental targets. One such target is that renewable energy (RE) should account for at least 42.5%, and ideally 45%, of total energy use by 2030.[11] Although a larger share of RE is necessary to reach the net-zero climate target in 2050, it is obvious that a binding RE target is irrelevant. The EU ETS will increase the cost of fossil fuels, making RE more attractive. This will encourage a substitution between RE and fossil fuels to meet the 2050 goal. However, if the RE target accelerates the expansion of RE faster than the EU ETS, the excess expansion will displace fossil energy in some sectors covered by the ETS, thus decreasing demand for allowances.

The decreased demand for allowances will drive the price down, leaving room for more and cheaper emissions in other sectors covered by the ETS. As can be seen from Figure 1, this reduced demand will not affect total emissions from the EU, as the cap remains unchanged. The acceleration will therefore drive the price of allowances down, resulting in an unchanged number of allowances being sold. At the same time, a binding RE target will result in higher abatement costs on this margin compared with other margins, compromising cost-efficiency. Every GHG emission reduction comes with a price – the abatement cost. The reductions resulting from a binding RE target will thus be more expensive than reductions implemented due to the ETS. From the figure in Box 1, it would correspond to emissions reductions to the right of q. In a fully efficient ETS, meaning an ETS with a 100% leakage rate, various climate policies have a limited effect on the actual emissions from the EU. This is due to the above-described waterbed effect. Excess regulations are costlier in terms of cost per tonne of GHG emissions reduction, and at the same time they have virtually no effect on total emissions from the EU.

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[11] https://energy.ec.europa.eu/topics/renewable-energy/renewable-energy-directive-targets-and-rules/renewable-energy-targets_en.

State aid is an inefficient means of reaching climate targets

In addition to regulations, the EU provides significant green state aid. In 2020 the EU provided state aid equivalent to almost 1% of its GDP,[12] half of which was green state aid (Brøns-Petersen & Andersen, 2023). The Draghi Report suggests relaxing state aid rules even further (Draghi, 2024a; 2024b). Achieving the same climate target through subsidies is more expensive than taxes or allowances in an ETS. Box 2 explains why that is the case.

Previous studies have tried to estimate the difference in cost to obtain a given climate target through taxes or subsidies. One study has found that it is twice as expensive to use subsidies rather than taxes (Brøns-Petersen, 2020). Another study has found that it is two to four times as expensive to reach a specific climate target with a subsidy strategy compared with a uniform tax on GHG emissions (De Økonomiske Råds formandskab, 2020).

Box 2. State aid is inefficient

Figure B.2 depicts the energy market, consisting of price-dependent demand and supply of fossil and renewable energy (RE), respectively. The horizontal axis is quantity of energy, while the vertical axis is price of energy. Demand reflects the value added by additional energy consumption. The supply of fossil energy is assumed to remain at a constant price. Given the world market price of most fossil fuels and the relatively constant cost of adding new fossil-based powerplants, this seems to be an innocent assumption. However, this assumption is not essential; the linearity simply makes interpretation easier. In contrast, the supply of RE involves increasing marginal costs. This may reflect that the best wind sites can produce RE at lower prices than fossil energy. As RE use increases, less suitable wind sites and technologies must be used, and backup

[12] Excluding state aid for COVID-19.

costs increase. In the model, RE can be broadly understood as encompassing all RE and energy-saving initiatives.

The energy demand in the model initially corresponds to E_0 and an RE supply of V_0. The fossil energy supply corresponds to $E_0 - V_0$.

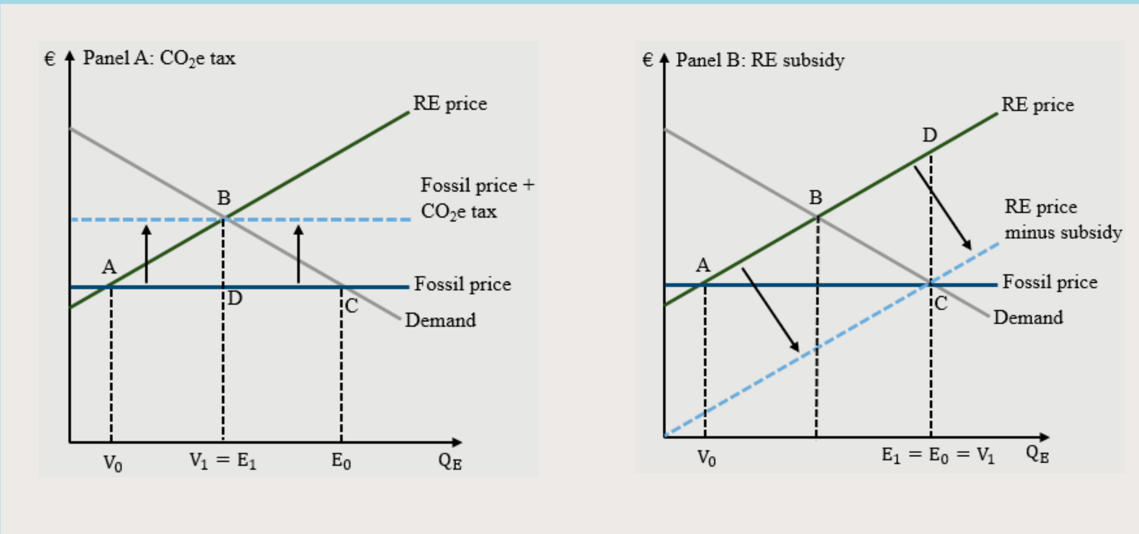
In panel A, a tax is introduced on CO_2e (or a corresponding price on emissions allowances). The tax shifts the fossil energy cost curve upwards. In the above example, the CO_2e tax is set at a level that completely displaces fossil energy, as the energy demand, E_1, equals the RE supply, V_1. However, full displacement is not essential to see that subsidies are more costly than taxes. The welfare cost of the CO_2e tax is approximated by the area ABC, which consists of two smaller triangles (ABD and BCD). The first triangle, ABD, approximates the additional cost of expanding RE supply at a marginal cost that exceeds the fossil fuel price. It is more costly to meet the demand with RE than with fossil fuel without the tax. The tax thus increases the cost of energy. The second triangle, BCD, corresponds to the lost welfare surplus associated with reducing demand from E_0 to E_1. The tax increases the cost of energy, which reduces energy demand. This can be seen from the fact that the willingness to pay for energy exceeds the fossil fuel price (excluding the tax). A reduction in demand is desirable, as the purpose of the tax is to reflect the true social cost of fossil fuel use. If consumers are not willing to pay the energy price (including the tax) of energy, then it is beneficial for society that this energy is not consumed, as the benefits would not exceed the social costs. The decrease in energy consumption can be the result of reduced usage or increased energy efficiency.

In panel B, a subsidy is introduced instead of a CO_2e tax. This shifts the RE supply curve outwards. The subsidy is large enough to displace fossil energy, as $E_0 = E_1 = V_1$. The marginal cost of energy to consumers remains unchanged. This contrasts with panel A, where the marginal cost of energy to consumers increases due to the tax. In panel B the welfare cost can be approximated by the triangle ADC. This cost is the actual additional cost of producing the extra RE to keep energy consumption unchanged.

Comparing panel A and panel B, the welfare cost of a subsidy (ADC) is larger than that of a CO_2e tax (ABC). Given the linear assumptions of demand and supply in the simple energy model, the rule of thumb is that the welfare cost is twice as high with subsidies than with a CO_2e tax. This is because reducing total energy demand from E_0 to E_1 in panel A is cheaper than replacing fossil energy with RE. This holds true even if the drop in energy demand is due to a reduction in exports resulting from reduced competitiveness.

From panel A it can also be seen that the CO_2e tax acts as an indirect subsidy to RE, as the price on RE increases from point A to point B due to the tax.

Figure B.2. Tax vs. subsidy



The ETS deviates from an efficient cap-and-trade scheme

However, the ETS and the ETS2 are not fully efficient, meaning that the carbon leakage rate within the system is not always 100%. This implies that the above regulations may have a global climate impact. As described previously, a fully efficient ETS can be understood as a waterbed.

Pushing down on one corner of a waterbed causes the water to bulge up elsewhere. Likewise, policies aimed at reducing emissions within one sector covered by an ETS will be offset by increased emissions in another sector covered by the ETS. The extent of this offset depends on the carbon leakage rate.

The carbon leakage rate can deviate from 100% in the EU ETS owing to the Market Stability Reserve (MSR).[13] The aim of the MSR is to rebalance the EU ETS when there is either a large or a small surplus of allowances in circulation. The MSR was agreed on in 2015 following the build-up of a large surplus of allowances. This surplus accumulated due to the 2008 economic crisis, which lowered demand for allowances, as well as a higher-than-anticipated influx of international credits exchanged for allowances and used for compliance in the EU ETS up to 2020.

A large surplus of allowances drives the price of allowances down, and vice versa. If there is a large surplus of allowances in the market, the MSR cancels a few allowances. Conversely, if the total number of allowances falls below a certain threshold, the MSR releases more. The MSR thus seeks to minimise price volatility. However, the MSR introduces uncertainty to the ETS, as emissions reductions within the scheme can have an ambiguous impact on global emissions.

If a Member State pursues climate policies that lower demand for allowances, this increases the allowance surplus in the EU ETS, which can lead to more allowances being cancelled by the MSR. This implies that the carbon leakage rate is less than 100% and that an actual emission reduction happens as a result of the policy. The waterbed is punctured, so to speak. Conversely, the carbon leakage rate can theoretically be above 100%. For example, if a Member State cancels allowances to pursue more ambitious climate impact, it can reduce the surplus of allowances below the threshold that triggers the MSR to release more allowances. Such a policy

[13] https://climate.ec.europa.eu/eu-action/eu-emissions-trading-system-eu-ets/market-stability-reserve_en.

can thus result in a net increase in emissions from the EU. In other words, it would be like trying to remove some water from the waterbed but ending up filling it with more.

The MSR thus creates uncertainty about the actual climate effect of various endeavours. This means that the emissions reduction cost is uncertain, counteracting the cost-efficiency of the ETS. However, that the leakage rate can be below 100% does not constitute an argument in favour of the above-described regulations. The ETS remains the most suitable climate policy instrument in the EU. Instead, the MSR should be scrapped for a more cost-efficient ETS. If the EU or the Member States want to pursue more ambitious climate goals beyond what the ETS is able to accomplish, more regulations are not the solution. More ambitious climate targets can only be achieved by cancelling allowances. The MSR can counteract this effect, which also argues in favour of abolishing the MSR.

Some estimates suggest that the surplus of allowances will decrease to the extent that the carbon leakage rate will be close to 100% from the beginning of the 2030s (Beck, Kruse-Andersen, & Stewart, 2023; Silbye & Sørensen, 2023). This will remove some of the uncertainty and enable the ETS to operate more efficiently. A price stability mechanism is incorporated into the ETS2.[14] If the price of allowances exceeds €45 (2020 prices), it will trigger the release of a given number of allowances from the MSR. This is intended to address excessive price increases. Similarly, if the price of allowances increases too rapidly, additional allowances may be released from the reserve.

The price stability mechanism acts as a soft price ceiling. This implies that the price of emissions can be interpreted as a tax, since the price rather than the quantity of allowances is somewhat fixed. A more reliable way of meeting quantitative targets would be to have an ETS without price controls. However, price controls can provide insurance against uncertainty, and

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[14] https://climate.ec.europa.eu/eu-action/eu-emissions-trading-system-eu-ets/ets2-buildings-road-transport-and-additional-sectors_en.

a price cap may be necessary to ensure the political feasibility of the scheme. If the price stability mechanism is activated, the climate targets should be adjusted accordingly. Otherwise, the missing reductions would need to be found outside the ETS2, for example in the EU ETS or from the land use sector. Extra reductions in these sectors are likely to be more costly than what could be realised through the ETS2, which is why failing to adjust the climate targets increases the cost of the green transition.

The Carbon Border Adjustment Mechanism is questionable

The EU introduced the Carbon Border Adjustment Mechanism (CBAM) in 2023.[15] The CBAM aims to reduce global carbon leakage associated with EU climate policies. In practice, the CBAM imposes carbon taxes on imports from countries with less stringent climate regulations. The following goods and selected precursors are covered by the CBAM: cement, iron and steel, aluminium, fertilisers, electricity, and hydrogen.

As climate change is a global issue, reducing global emissions seems a reasonable goal. To ensure proper incentives to mitigate climate change, each actor should bear the cost of their actions (or inactions). Theoretically, the CBAM is an appropriate tool to incentivise countries lacking climate policies to implement them, as otherwise they are taxed by the EU. However, the implication of the CBAM is that the EU is seeking to reduce GHG emissions from other countries. This contradicts the Paris Agreement, under which each participant is responsible for territorial GHG reductions. There is good reason for this, as GHG content is most reliably measured and regulated at the source.

While the CBAM in theory is a tool for putting pressure on the rest of the world to implement climate policies, this does not mean that it is effective, given that it is associated with significant uncertainty. The mechanism will incur administrative costs, and its global climate impact is

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[15] https://taxation-customs.ec.europa.eu/carbon-border-adjustment-mechanism_en.

doubtful. Because it is not possible to regulate the source directly, there is great uncertainty associated with the GHG intensity of goods and thus the tax that should be paid.

Furthermore, within the EU the CBAM will compromise the cost-effectiveness of the ETS system by in effect introducing uneven CO_2e pricing, since the CBAM will act as a subsidy to producers protected by the CBAM. There is also a risk that the CBAM will effectively act as a protectionist trade tariff, restricting competition and distorting markets, which could also provoke protectionist countermeasures from the rest of the world and contribute to the ongoing vicious protectionist cycle. Climate policies should not be used for trade policy purposes – restricting trade harms productivity, and thus competitiveness. Therefore, competitiveness is not a convincing argument in favour of the CBAM.

A different approach should be adopted to ensure global cooperation. A tit-for-tat strategy could incentivise global participation. Currently, the EU is pursuing ambitious climate targets, regardless of whether the rest of the world is doing the same. This incentivises other countries to 'free ride' on the EU's mitigation initiatives. While everyone benefits from these, only the EU bears the cost. Although the EU's policies are insufficient to address the global climate challenge, this does not change the fact that the incentives are flawed.

Therefore, the EU should promote incentives that ensure a better balance between benefits and costs. This is where the tit-for-tat strategy could be useful. The EU should make its climate action dependent on other countries' participation, so that countries only benefit if they also bear the associated costs. At first glance, this strategy may seem risky, given the severity of climate change. However, this should be balanced against the fact that EU emissions account for just 6% of global emissions.[16] Therefore, the EU cannot realistically limit temperature increases alone and must depend on other countries to reduce emissions too. However, for such

[16] https://edgar.jrc.ec.europa.eu/report_2024.

a strategy to become part of global cooperation, an update of the Paris Agreement will be required.

The EU's potential to implement cost-efficient climate policies

There are two criteria for a cost-efficient regulation of GHG emissions. Firstly, as it is a global problem, it requires global support. Secondly, GHG emissions should be priced uniformly according to their marginal global impact. The Paris Agreement seeks to address the absence of global coordination for a uniform global CO_2e price.

The EU is thus, from the Member States' point of view, best equipped to participate in the Paris Agreement and regulate emissions.

However, the Paris Agreement has temperature targets rather than a target to price global emissions according to their global impact. At the same time, the EU does not have the competence to impose a uniform tax on GHG emissions. Nevertheless, the EU has access to another cost-efficient instrument, which is the ETS. The ETS caps GHG emissions, making it a suitable instrument for achieving the specific temperature targets defined in the Paris Agreement. In addition, allowances are tradable. Market-based pricing of GHG emissions ensures that the cheapest reductions are implemented, providing a cost-efficient path to achieve a given climate target.

The ETS gives the EU the potential to promote a cost-efficient path towards reaching the net-zero climate target by 2050. However, the EU has introduced several additional regulations alongside the ETS to facilitate the green transition. These regulations hinder a cost-efficient green transition and thus reduce competitiveness. To realise the potential for a cost-efficient path to net zero, EU climate policies need to be reformed. Ideally, a single ETS would cover all GHG emissions from all sectors. This would ensure a uniform price on emissions across Member States, sectors, and uses. This should be the overarching target of EU climate policy. Special considerations for the land use sector will be discussed later.

As described in Box 1, an important aspect of cost-efficient climate policy in the EU is uniform pricing of all GHG emissions. However, this is not the case for the ETSs, as evidenced by the current and planned extension with the ETS2. Having two different ETSs implies different prices for emissions within the two systems. For example, the expected price of allowances in 2030 is projected to be approximately €80 in the ETS and approximately €30 in the ETS2 (Energistyrelsen, 2024). Different prices mean that cheaper reductions are available but are not being implemented. This is explained in Box 3.

Box 3. Numerical example of non-uniform prices

Figure B.3 is an amended version of the one in Box 1. This version shows two different MAC curves representing two groups of abatement options. The horizontal axis shows the amount of abatement, and the vertical axis shows the carbon price. The objective in both panels is to abate 100 tonnes of CO_2e across the two groups (Q = 100).

In panel A, there is a uniform carbon price across the two groups. Based on the slopes of the MAC curves, abating a total of 100 tonnes across the two groups is achieved at a cost of approximately €34 per tonne of CO_2e. This implies that approximately 41 and 59 tonnes are abated from MAC_1 and MAC_2, respectively. The abatement cost in MAC_1 is A + B, and the abatement cost in MAC_2 is B + C. The total abatement cost in panel A is therefore A + 2B + C, which corresponds to a total cost of €1,144 in this hypothetical scenario. The marginal cost of abatement is equal for both groups in panel A, implying that the most expensive abatement for both MAC_1 and MAC_2 is €34.

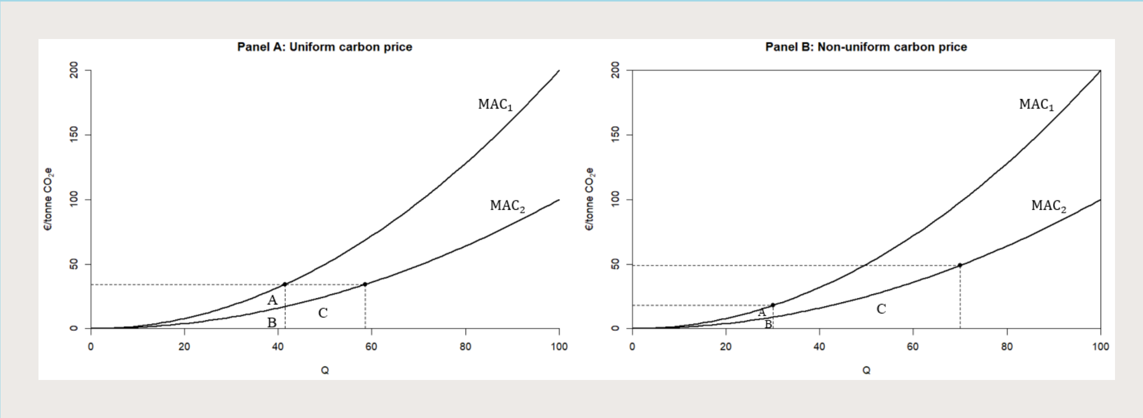
In panel B, there are different CO_2 prices for the two groups. In this scenario, 30 tonnes of CO_2e are abated from MAC_1 and 70 tonnes of CO_2e from MAC_2, totalling 100 tonnes of CO_2e. This implies respective prices of €18 and €49 per tonne CO_2e. The abatement cost from MAC_1 is the sum of A and B, while the abatement cost from MAC_2 is the sum of

B and C. However, the total cost in panel B is €1,323 in this hypothetical scenario, which is almost 16% greater than under a uniform carbon price. The most expensive abatement from MAC_2 is €49 – considerably higher than in panel A.

The reason it is more expensive with a non-uniform carbon price than with a uniform one is that it would be possible to replace costly emissions with cheaper ones. This can be seen from the figure below. In panel B it is seen that to abate 100 tonnes CO_2e, it would be possible to increase abatement under MAC_1 and reduce abatement correspondingly from MAC_2. The total abatement cost would therefore decrease. This is possible until the carbon price is equal across sectors, as shown in panel A, which is the cost-minimising price.

Therefore, the same level of reduction could be achieved more cheaply by setting a uniform price on emissions across both ETSs.

Figure B.3. Total costs under uniform and non-uniform carbon pricing



Having two different ETSs with different prices therefore is not cost-efficient, and the ETSs should be unified under a single system. A unified ETS is estimated to reduce overall welfare costs by 25% (Herby, 2023). From 2027 the ESR and ETS2 will be overlapping. This means that Member States are required to deliver emissions reductions in the sectors covered by the

ESR, while these are also included in the ETS2. As described in the previous section, in a fully efficient ETS, additional targets, such as the ESR, will not affect the number of allowances, and therefore total EU emissions. The targets under the ESR should therefore be abolished when the ETS2 comes into effect.

To ensure symmetric incentives to reduce GHG emissions and to permanently remove emissions from the atmosphere, negative emissions – that is, carbon capture – should also be integrated in a single ETS. In practice, new allowances should be granted for documenting permanent carbon removal in the ETS, which can then be sold on the market. This creates an incentive to reduce the amount of GHG in the atmosphere, just as the price of GHG does. This would ensure that the cheapest emissions reductions are implemented. Negative emissions will be necessary if the EU is to reach its net-zero climate goals and emissions are still being generated, for example, from the land use sector. Therefore, it is promising that the Commission is proposing an amendment to the Climate Law to include permanent removals in the ETS.[17] Meanwhile, climate regulations other than ETSs should be reconsidered. As described earlier, regulations such as bans on ICEs, emissions standards, renewable energy targets, sustainability reporting, and green state aid have virtually no influence on total EU emissions when a fully efficient ETS is in place. This implies that such regulations are far from cost-efficient, as they work against a marked-based green transition. Inefficient regulations counteract competitiveness by increasing costs for businesses and consumers. This means that resources are redirected towards compliance rather than towards growth-enhancing activities. Therefore, the ideal EU climate policy would not include any of the above regulations or similar ones.

The land use sector is more challenging to integrate in an ETS

Ideally, GHG emissions and sequestration from the land use sector would also be part of a single ETS. However, there is inherent uncertainty in calculating emissions from natural processes,

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[17] https://ec.europa.eu/commission/presscorner/detail/en/ip_25_1687.

such as how much CO_2 forests absorb in a single year, or emissions from livestock. Practical challenges associated with inventories of emissions and sequestration removals can thus create uncertainties that favour keeping the land use sector separate from the ETS. In the long term, however, the sector should be included in an ETS to the extent possible. The Commission is currently discussing how to incorporate emissions from agriculture in an ETS (Directorate-General for Climate Action et al., 2023). Its practical implementation can be inspired by Denmark, which has adopted the world's first CO_2e tax on agricultural emissions (Ministry of Foreign Affairs of Denmark, n.d.).

Conclusion: EU climate policy needs to be reformed to boost competitiveness

The Draghi Report recommends decarbonisation as an area of action to reignite growth in the EU (Draghi, 2024a; 2024b). However, decarbonisation itself will incur costs for businesses and consumers. Nevertheless, reforming climate policies has significant potential to minimise costs and reduce the negative impact of climate policy on competitiveness. The EU already has the most cost-efficient climate policy instrument: the ETS. The cost-efficiency of EU climate policy is undermined not by a lack of instruments, but by an accumulation of overlapping targets, subsidies, and command and control rules that fragment the price signal and raise compliance costs.

To improve the EU's competitiveness, climate policy requires comprehensive reform. The first step should be to merge the existing ETS and the forthcoming ETS2 to ensure a uniform price on all covered emissions. Verified negative emissions should also be incorporated into the EU ETS. In the longer term, the land use sector should be incorporated into an ETS wherever possible. At the same time, substantial double regulation will occur when the ETS2 comes into effect in 2027, as all sectors covered by the ETS2 will also be covered by the ESR. Requiring reductions in Member States in sectors covered by an ETS will inevitably increase the cost of reductions, with a very questionable climate effect. Therefore, the targets under the ESR should be abolished.

Similarly, bans, technological standards, reporting requirements, and state aid should be phased out. None of these measures reduce total emissions when a binding cap in an ETS is in place, and they all inflate abatement costs. Finally, to reduce policy uncertainty around the cap itself, the MSR should be abolished. Theoretically, the CBAM is a relevant instrument for distributing reduction costs. In practice, however, it risks functioning as a protectionist tariff that invites retaliatory measures. Trade restrictions do not promote competitiveness. Furthermore, the climate impact of CBAM is questionable, which makes the rationale for the mechanism highly uncertain. Competitiveness is a critical issue that the current EU climate policy does not address. To boost productivity and growth, a comprehensive reform of the EU's climate policy is needed – and possible: all it takes is a single ETS.

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