ZEW policy brief

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// Dr. Jan Abrell (ZEW Mannheim) and
Prof. Dr. Sebastian Rausch (ZEW Mannheim, Heidelberg University)

A Smart Design of New EU Emissions Trading Could Save 61 Per Cent of Mitigation Costs[1]

Carbon pricing is a key instrument for achieving Europe's ambitious climate targets. It is therefore not surprising that reform of the EU carbon market is at the heart of the measures proposed by the European Commission (EC). One important policy innovation would be the introduction of a second emissions trading system in Europe that integrates other sectors like buildings and road transport. This addresses some of the inefficiencies of the existing, fragmented EU carbon markets, but at the same time requires a policy decision with potentially large implications in terms of economic costs to achieve European climate goals: How should the EU carbon budget be divided between two separate carbon markets? Achieving the EU climate target of 55 per cent causes a decrease in the aggregate consumption level of the EU-27 countries of 2.8 per cent or 246.9 billion euros in 2030 under current EU climate policy (without considering possible benefits from avoided climate change damages). A new emissions trading system reduces these costs by 21.5 per cent under the current allocation of the EU climate budget and by 33.0 per cent under the allocation proposed by the European Commission. Larger cost reductions of up to 61.6 per cent are possible if an even larger emissions budget is allocated to the buildings and transport sectors. Given the difficulties to politically determine the allocation of the EU climate budget, market-based flexibility mechanisms are desirable in order to achieve climate targets at the lowest economic cost.

KEY MESSAGES

- The introduction of a second, new emissions trading system is a step in the right direction, as it significantly reduces the economic costs of achieving the European climate targets.
- However, the burden of climate change mitigation on several sectors and member states depends largely on the allocation of the EU carbon budget to the two carbon markets that will then exist in parallel.
- A smart policy design that combines the introduction of a new emissions trading system with a cost-efficient allocation of the EU carbon budget can reduce the economic costs by up to 61 per cent. The decrease in aggregate consumption levels in the EU-27 countries in 2030 would be reduced from 2.8 per cent to 1.1 per cent, or from 246.9 billion euros to 94.7 billion euros per year.
- Market-based flexibility mechanisms are needed to determine the cost-effective allocation of the EU carbon budget.

[1] This policy brief is part of the project "ARIADNE – Evidenzbasiertes Assessment für die Gestaltung der deutschen Energiewende" funded by the Federal Ministry of Education and Research (BMBF).

REFORM OF CARBON MARKETS NEEDED TO MEET EUROPE'S AMBITIOUS CLIMATE TARGETS

Carbon pricing key to achieving ambitious EU climate targets

The reform of the EU carbon market is at the core of the package of measures proposed by the European Commission (EC). The revision of the current regulations follows the now binding stricter climate targets agreed by the European Parliament and EU Member States: greenhouse gas emissions are to be reduced by at least 55 per cent by 2030 compared to 1990 levels and a net-zero emissions balance is to be achieved by mid-century. Introducing an economy-wide carbon price is seen as a key instrument for achieving these ambitious targets. It signals, that policymakers are serious about achieving meaningful emissions reductions, and helps to mainstream climate protection measures cost-effectively across all sectors.

Inefficiencies from existing, fragmented EU carbon markets

Under current climate policy, emissions within the EU are regulated under two separate schemes: the EU Emissions Trading Scheme (EU ETS), which covers emissions from the electricity sector and energy-intensive industries, and the Effort Sharing Regulation (ESR), which defines national targets for transport, buildings, agriculture, and industries that fall outside the scope of the EU ETS. Emissions allowance trading under the EU ETS ensures that the cheapest abatement options are used first, minimising the overall economic costs of meeting the given emissions cap. In contrast, the ESR defines reduction targets for Member States, which prevents achieving the targeted reductions at the lowest costs. Potential efficiency gains remain unrealised due to the limited flexibility to shift carbon reductions between the EU ETS and the ESR.

Division of carbon budget directly impacts economic burden of several sectors and EU Member States

The EC has now proposed to establish a second, stand-alone emissions trading system from 2026 onwards, which will cover emissions from buildings and road transport.[2] This would create a second, major market for carbon in Europe alongside the EU ETS, the EU ETS2. This points the way forward for future EU climate policy, but raises a fundamental question: how should the total emissions budget available in the EU, equivalent to meeting the 55 percent target, be divided between the two separate carbon markets? The importance of this single policy decision cannot be overstated. As the cost of emissions reductions varies widely across sectors and Member States, it is critical for achieving the EU's climate targets at the lowest cost, and it has a significant impact on how the economic burden is shared between sectors and Member States. The EC has also made an (implicit) proposal on a split of the EU carbon budget between the EU ETS and a potential EU ETS2. It should be seen as an initial reference point in the intense political debate over the next year. This policy brief provides information on how the expected economic costs and CO_2 prices for achieving the EU's 2030 climate targets depend on the degree of carbon market integration and the allocation of the EU-wide carbon budget across different markets.

CARBON MARKET INTEGRATION AND ALLOCATION OF EU CARBON BUDGET AFFECT COSTS TO MEET CLIMATE TARGETS

Policy choice decisive for economic costs

The economic costs of achieving the EU's 55 per cent target for 2030 are not negligible.[3] We estimate that the loss in EU-27 consumption in 2030 is between 1.1 per cent and about 2.8 per cent (see Figure 1, vertical axis), corresponding to 94.7 – 246.9 billion euros per year. Importantly, this wide range of costs depends on two key policy decisions: (1) whether or not to implement a second emissions trading system (green and blue lines) and (2) how to allocate the EU carbon budget between the two carbon markets.

New emissions trading reduces economic costs for EU-27

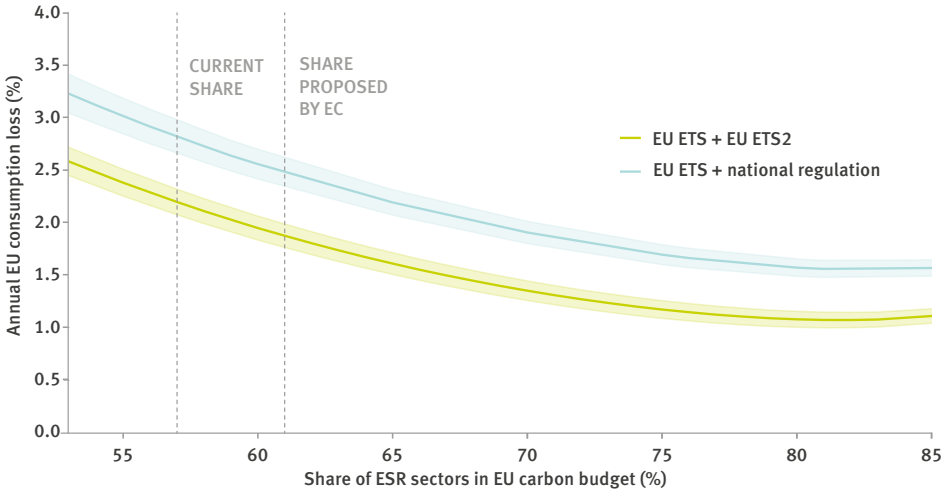
Introducing a second emissions trading system as proposed by the EC is a step in the right direction. Regardless of how the EU emissions budget is allocated between the two systems, it sub-

[2] European Commission, 14 July 2021: Proposal for amending Directive 2003/87/EC, COM(2021) 551 final.

[3] Our measure of economic costs does not include potential benefits of avoided climate damage (for example, positive effects on health or labor productivity due to reduced local air pollution).

stantially reduces the economic costs of achieving the 55 per cent target (comparing green and blue lines in Figure 1): the consumption loss is reduced by 0.5 – 0.6 percentage points. This amounts to a reduction in the EU-27 consumption loss of 43.4 – 56.0 billion euros in 2030. Economic costs are lower because the new EU ETS2 trading system facilitates the exchange of expensive abatement options in one country for cheaper options in another.

FIGURE 1: ECONOMIC COSTS FOR EU-27 OF ACHIEVING THE 55 PER CENT CLIMATE TARGET



Source: Own calculations of ZEW based on macroeconomic model of EU economy. Economic costs refer to the projected change in EU-27 annual consumption in 2030. Costs exclude the benefits from avoided climate change (e.g., health benefits from reduced local air pollution and savings in adaptation costs). Simulations are stochastic including uncertainty about GDP growth and future technology (abatement costs). Shaded areas denote standard deviations and solid lines the expected values.

All EU Members States could benefit from new emissions trading

Would all Member States benefit from the introduction of the EU ETS2? Countries with high abatement costs under the current system would benefit from the increased flexibility, whereas countries with low abatement costs would have to avoid more emissions, leaving them worse off. However, as emission allowances for the new emissions trading will be auctioned, the revenues could be used to compensate Member States with higher abatement burdens.[4] In principle, it is therefore possible to make all Member States better off by introducing the EU ETS2.

Smart allocation of EU carbon budget substantially lowers costs to meet 55 per cent target

Currently, about 57 per cent of the EU carbon budget is allocated to ESR sectors. Under the EC's proposal, this share would increase to 61 per cent. This amounts to a further reduction in the EU-27 consumption loss of 28.4 billion euros in 2030. Thus, giving the buildings and transport sectors a higher emissions budget, and accordingly requiring that the EU ETS contributes disproportionately more to achieving the 55 per cent target, is a step in the right direction. According to our analysis, allocating about 80 per cent of the EU carbon budget to the EU ETS2 would minimise the EU-27 consumption loss to 1.1 per cent. This is a major efficiency gain: the policy costs of meeting the 55 per cent target are basically halved relative to the current split of the EU carbon budget and still reduced by 42.7 per cent compared to the split proposed by the EC. The combination of measures, i.e. the introduction of EU ETS2 and the optimisation over the current split, reduces policy costs by 61 per cent and saves 152.2 billion euros.

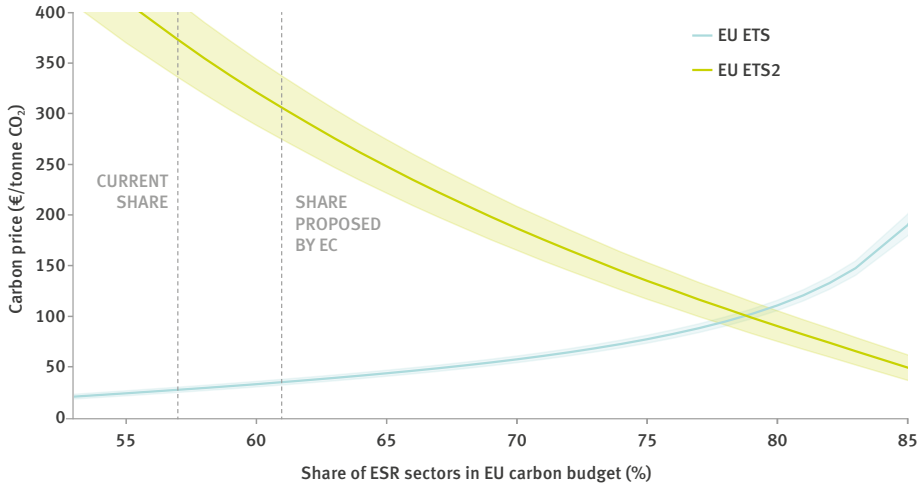
Carbon price differences across markets add to costs

Efficiency gains are driven by the harmonisation of carbon prices. Under the current allocation of the EU carbon budget, the price of tradable emission permits in the EU ETS2 would be several orders of magnitude higher than the price of allowances in the EU ETS (see Figure 2). This reflects the empirical fact that abatement costs per tonne of CO_2 are much higher in the buildings and transport sectors than in the EU ETS sectors. By shifting more of the EU carbon budget to the ESR

[4] See, for example, Abrell and Rausch "Higher Price, Lower Costs? Minimum Prices in the EU Emissions Trading Scheme", The Scandinavian Journal of Economics. *https://doi.org/10.1111/sjoe.12279*

sectors, abatement costs per tonne and CO_2 prices converge. Thus, fewer of the high-cost abatement options are used in the ESR sectors and overall costs are lower.

FIGURE 2: CO_2 PRICES IN 2030 FOR THE TWO EUROPEAN CARBON MARKETS OF ACHIEVING THE 55 PER CENT CLIMATE TARGET



Source: Own calculations of ZEW based on macroeconomic model of EU economy. Shaded areas show standard deviations and solid lines expected values. Simulations are stochastic including uncertainty about GDP growth and future technology (abatement costs). Shaded areas denote standard deviations and solid lines the expected values.

FIELDS OF ACTION FOR FUTURE EU CLIMATE POLICY

With two separate emissions trading systems, the allocation of the EU carbon budget is inevitably an important political decision. There is a great need for information to determine a carbon budget split that realises the highest efficiency gains. We thus propose using market-based mechanisms to more flexibly allocate emissions allowances across the two trading systems.[5] Such mechanisms may include partial linking of the trading systems, setting upper and lower carbon price bounds, or coupling the various market stability reserves, and may be also be instrumental in moving towards a fully integrated European carbon market with a single, uniform carbon price.

Less political discretion, more market-based flexibility in allocating EU carbon budget is desirable

[5] See, for example, Abrell and Rausch "Combining Price and Quantity Controls Under Partitioned Environmental Regulation", Journal of Public Economics. *https://doi.org/10.1016/j.jpubeco.2016.11.018*

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Publisher: ZEW – Leibniz Centre for European Economic Research
L 7, 1 · 68161 Mannheim · Germany · info@zew.de · www.zew.de/en · twitter.com/ZEW_en
President: Prof. Achim Wambach, PhD · Managing Director: Thomas Kohl

Editorial responsibility: Dominic Egger · kommunikation@zew.de