



Options for a Carbon Pricing Reform

Expertise by MCC and PIK
for the German Council of Economic Experts

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**POTSDAM INSTITUTE FOR
CLIMATE IMPACT RESEARCH**

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Options for a Carbon Pricing Reform - Executive Summary

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German climate policy is in need of fundamental realignment. Under the EU Effort Sharing Regulation, Germany must reduce its emissions in the transport, heating, agricultural sectors and parts of the industrial and energy sectors by 38 percent until 2030 compared to 2005; otherwise, significant penalties are imminent. This requires much steeper carbon emission reductions than in previous years. The German government is therefore planning to pass a Climate Protection Law by the end of this year. Germany, however, cannot achieve its ambitious emission reduction targets on the basis of its current climate policy configuration. Existing economic incentives are insufficient to reduce emissions by the required amount, which is exacerbated by investors and innovators facing considerable uncertainties about the future direction of climate policy. In addition, the measures taken so far are socially unbalanced. The climate policy framework urgently requires realignment towards the central goal: mitigating carbon emissions. Carbon pricing should thus become the core instrument of climate policy.

At the same time, **dissatisfaction with inadequate climate policy progress** has been growing in various parts of society: National climate targets for 2020 will not be met. The young generation, prominently represented by the ‘Fridays for Future’ movement, is worried about the livelihoods of both its own and future generations. Climate protection has become a key topic in mainstream discourse. This has put pressure on policymakers to act. This renewed vigour should be harnessed to implement a comprehensive reform of climate policy.

The necessary reforms can only be achieved via a paradigm shift, whereby environmental and climate policies are aligned with the fundamental principles of the **Social Market Economy**. The goal is to promote competition for developing the least-cost mitigation technologies, to strengthen investment reliability, minimize overall costs, and distribute the burden fairly among households and companies. Complementary policies and measures should supplement carbon pricing as the key instrument in the future climate policy mix.

Introducing carbon pricing in Germany requires taking a threefold perspective: first and foremost, **the point of convergence for a carbon pricing reform is a harmonized European carbon pricing system**; secondly, Germany should rapidly implement a national carbon pricing reform as an intermediate step to achieve its national targets under the EU Effort Sharing Regulation; thirdly, the European carbon pricing reform should become the basis for successful, international climate negotiations. With this reform, Germany and Europe have the opportunity not only to advance European climate policy but to strengthen their positions in international negotiations.

Ten key points describe the goals and pathways of this reform:

- 1. The goal is a uniform carbon price across all sectors.** Emissions must be cut at unprecedented speed. Therefore, economies need to ensure efficiency of mitigation pathways and minimize costs. Emissions should be reduced where doing so is cheapest and most innovative potential can be tapped. Taking into account restrictions imposed by political feasibility as well as the need for rapid implementation, sectorally differentiated carbon prices are acceptable during a transition period. This holds only if climate policy converges towards a uniform European carbon price in all sectors in the medium term which is the best pathway for decarbonizing the economy in a coordinated and least-cost way. A uniform, cross-sector carbon price also allows policy-makers to achieve distributional, competition, innovation, and industrial policy goals. A variety of complementary measures are available to accomplish these tasks. The EU Emissions Trading System (EU ETS), supplemented with a minimum carbon price while covering all sectors, constitutes the long-term point of convergence.
- 2. Germany rapidly needs to reform climate policy in the transport and heating sectors to meet its European obligations.**¹ At the European level, German policy makers have committed to reducing emissions significantly in the non-ETS sectors by 2030. This objective cannot be achieved by using existing climate policy. There are basically four ways to fulfil Germany's European commitments (Figure Z.1): (1) The current policy mix, based on regulation, funding programmes and voluntary commitments, will be expanded; (2) a carbon tax will be introduced by harmonising current energy tax rates towards a single carbon price (with exception of the transport sector, where the carbon price is added to the existing energy tax); if the reduction targets are not met, the tax will be adjusted; (3) a national emissions trading system, including reliable minimum and maximum prices, will be established while energy taxes are reduced to EU minimum rates (with the exception of the transport sector); (4) the transport and heating sectors will be included in the EU ETS; energy tax rates will be reduced to EU minimum rates (with the exception of the transport sector).

¹ To simplify language in this expertise, when referring to the sectors 'transport and heating' we specifically mean CO₂ emissions from burning fossil fuels in the following sectors: transport (except for air and rail transport which are already covered by the EU ETS, ship transport, and except shipping), buildings (space heating and hot water preparation for households, commerce, trade, and services), energy-related emissions from non-ETS industry, and power plants not covered by the EU ETS (below the threshold of 20 MW thermal output or other ETS exemptions, such as waste incineration). Emissions from other greenhouse gases (GHG) are not included in this study. For example, apart from carbon emissions from transport fossil fuels, GHG emissions from the agricultural sector are excluded. GHG pricing in the agricultural sector requires clarification of a number of issues, related to measuring emissions, transaction costs, and efficient alignment of incentives.

Options for achieving the German non-ETS sector emission targets under the EU Effort Sharing Regulation

- 1 Expansion of regulation, funding programmes and voluntary commitments [regulation]
 - 2 Carbon tax for transport and heating via energy tax rate adjustment [carbon tax]
 - a) Low supplementary tax
 - b) High significant tax
 - 3 German emissions trading system for transport and heating [DE ETS]
 - a) Only in Germany
 - b) Linked to analogous ETS in other EU member states
 - 4 EU ETS inclusion of transport and heating [EU ETS]
 - a) Unilateral inclusion only by Germany
 - b) Inclusion with a coalition of member states
 - c) Inclusion with all member states
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Figure Z.1: Options for achieving German climate targets in non-ETS sectors under the EU Effort Sharing Regulation.

3. **Both a carbon tax and an emissions trading system (ETS) enable a swift introduction of carbon pricing in Germany; under an appropriate policy design, both instruments are basically equivalent.** Launching carbon pricing in the transport and heating sectors using a national carbon pricing tool makes sense. This is because inclusion in the EU ETS will require time-consuming and politically uncertain coordination. Analysis of the four options (based on criteria, such as attaining targets, efficiency, distributional effects, and political feasibility) yields the following assessment (Figure Z.2): The ‘regulation’ option, (1), is costly and socially unbalanced due to potentially regressive distributional effects. Indeed, (1) cannot ensure compliance with European emission reduction targets. While ‘Integration into the EU ETS’ – option (4) – is theoretically compelling because of the potential for EU-wide, uniform carbon pricing, it is associated with considerable political and legal risks as a short-term option. These risks will likely result in (4) being delayed or even failing to attain Germany's emission reduction targets. On the other hand, both a ‘carbon tax’, option (2), and the option ‘National Emissions Trading System for Transport and Heating’, (3), enable a swift carbon pricing reform in Germany. This reform can be designed in an effective, efficient and socially balanced way. Both instruments are basically equivalent as long as they are structured appropriately. A carbon tax needs to be assessed and adjusted frequently in order to achieve the targets of the EU emissions sharing decision. A German emissions trading scheme requires a price collar to facilitate investments and to prevent extreme price fluctuations. Policymakers have to decide whether carbon taxes can be adjusted or whether they can commit to minimum and maximum prices in an emissions trading scheme. It seems that introducing a ‘carbon tax’, however, can be done in a faster and administratively easier way as for an emissions trading scheme, where financial market or state subsidy issues still have to be clarified.








	 Attaining 2021-2030 targets under EU Effort Sharing Regulation	 European compatibility	 Efficiency	 Distribution	 Administrative effort	 State revenues	 Political implementation challenges
Regulation	difficult	low	low	likely regressive	low	none	medium
Carbon tax (With adjustment)	uncertain	coordinated taxes possible	medium	progressive outcome possible	low	additional	medium
DE-ETS (With price corridor)	uncertain	linking possible	medium	progressive outcome possible	medium	additional	medium
EU-ETS inclusion	uncertain	joint EU instrument	high	progressive outcome possible	medium	additional, but less	high

Figure Z.2: Evaluation of the options for attaining the German mitigation targets in non-ETS sectors under the EU Effort Sharing Regulation based on different criteria (options 1, 2b, 3a, and 4a; red box = problematic, yellow box = medium, green box = good rating).

4. **Effective carbon pricing requires a flexible, robust and credible institutional framework.** Regardless of its design – either as a tax or as an ETS – the system must be able to respond to significant technological or broader climate policy changes. Additionally, a carbon tax needs to be robust against business cycles, inflation, demand responses as well as fluctuations of oil and gas prices, in order to maintain its steering effect. A carbon tax therefore requires a frequent adjustment mechanism to ensure that a fixed emissions target is attained. The initially chosen carbon tax pathway should start at around 50 euros per tonne of CO₂ in 2020, increasing to 130 euros by 2030. For an ETS, the minimum price could start at 35 euros in 2020 and then increase to 70 euros by 2030; the maximum price could be around 70 euros in 2020 and rise to 180 euros by 2030. In contrast to the tax, the price collar does not require frequent adjustment since prices can form freely within the collar. An appropriate institution with market observation capabilities should be set up, suggesting evidence- and rule-based adjustments of the carbon tax pathway or the price collar. This increases reliability and planning security.
5. **A German carbon pricing reform should swiftly converge on an integrated European carbon pricing system; in the meantime, a minimum price in the EU ETS should be implemented (Figure Z.3).** In addition to introducing carbon pricing in transport and heating immediately at the national level, Germany should push ahead with the introduction of an integrated, Europe-wide carbon pricing system in order to prevent lasting fragmentation and correspondingly high costs of European climate policy. The EU ETS provides the obvious point of convergence and can be expanded by including the transport and heating sectors of all EU Member States. Moreover, a minimum price should be introduced in the EU ETS, ideally EU-wide or in a coalition of countries but, if necessary, unilaterally by Germany. As the system currently fails to provide a reliable framework for long-term investment this seems to be indispensable. This fact is underlined, for example, by the potential risk that Germany's 'Kohleausstieg' (coal phase-out) may not achieve the desired cuts in emissions. In the non-ETS sector, even before converging on an EU-wide carbon pricing approach, a 'coalition of the willing' can immediately coordinate its carbon pricing measures – either in the form of coordinated energy taxes (in case of carbon taxes) or in the form of linked multinational emissions trading systems.

Sequencing options for European carbon pricing in non-ETS sector

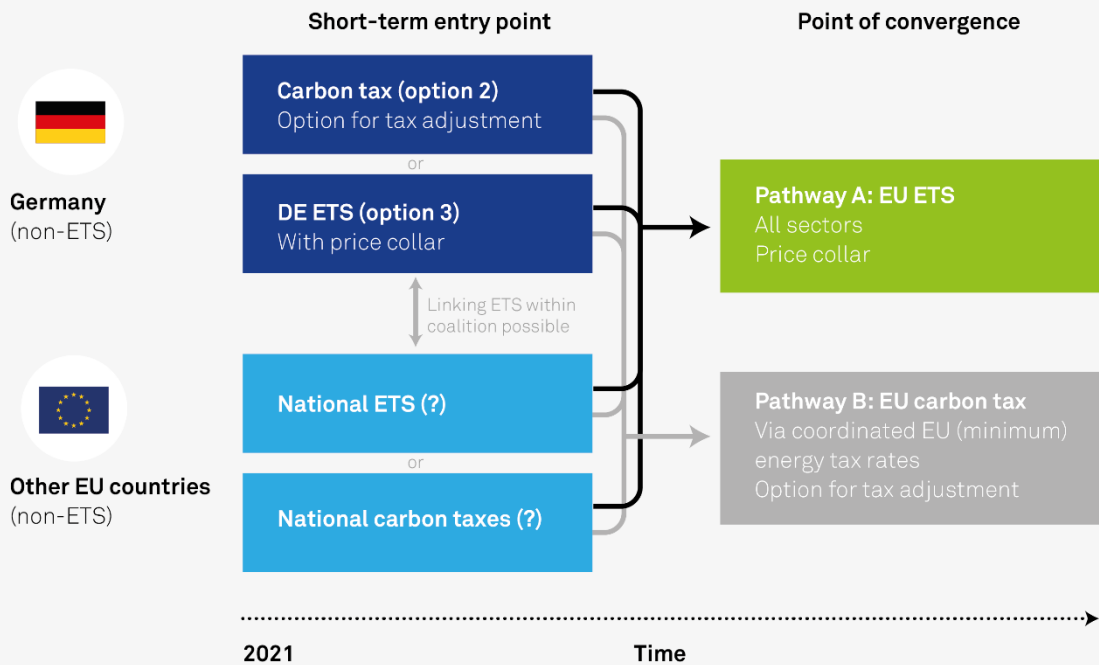
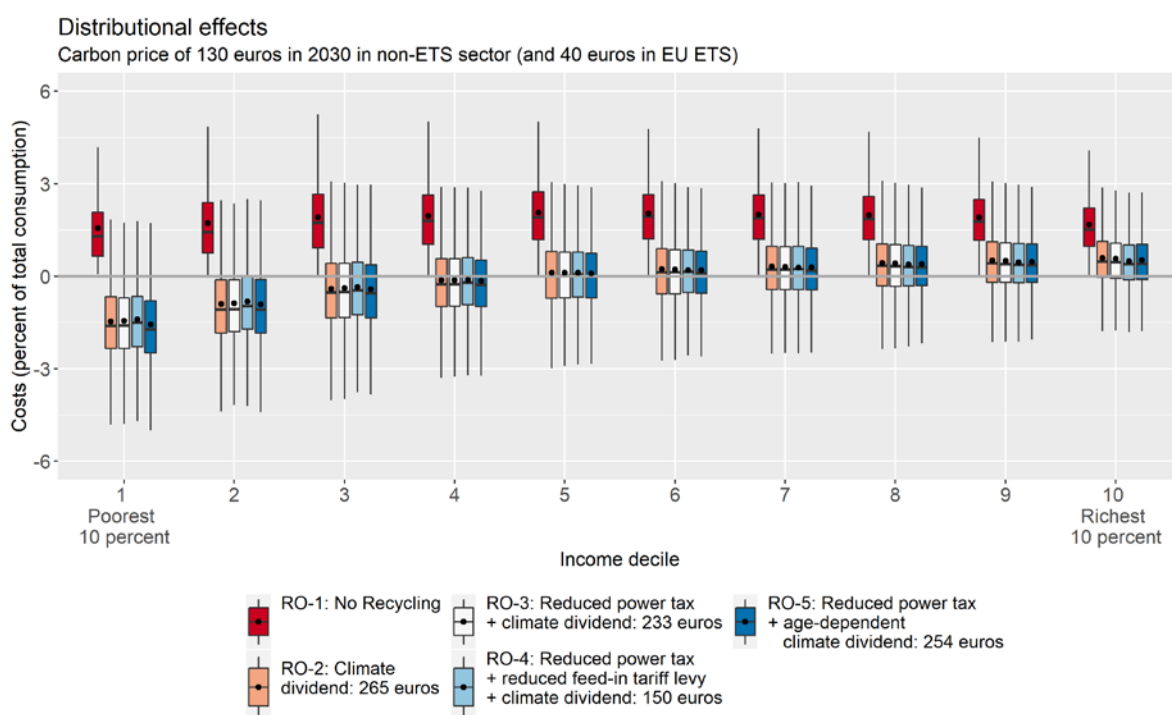


Figure Z.3: A German carbon pricing reform should converge into a European carbon pricing system. In general, both the EU ETS and coordinated carbon taxes are conceivable points of convergence. The EU ETS as the already existing system appears to be the most obvious option.

- A successful carbon pricing reform at national and European levels facilitates successful international climate negotiations.** Climate protection is a global task: if Germany and Europe manage to establish strong carbon pricing systems, they could negotiate with other countries to coordinate regional and national minimum carbon prices. Poorer countries should be supported by conditional transfers within the institutional framework of the Green Climate Fund (GCF) – if they introduce (higher) carbon prices. This creates disincentives for free-riding, thereby providing the necessary conditions for successful international cooperation via promoting the principles of reciprocity and fairness.
- Carbon pricing must be supplemented by complementary climate policy instruments and measures.** A cross-sectoral single price should become the core instrument of climate policy. Yet dynamic incentives of carbon pricing can be distorted by market or policy failures. Therefore, a carbon price path should be complemented by sector-specific policy instruments and measures that specifically correct these failures. In the heating sector, for example, viable options include information programmes, tax incentives or funding programmes for the building renovation. In the transport sector, policy makers should increase the effectiveness of carbon prices by expanding the infrastructure for e-mobility, public local and long-distance transportation as well as by facilitating intelligent freight transport. Efficiency standards, bonus-malus systems and provision of information can be helpful tools to overcome short-sightedness of purchasing decisions. Moreover, a comprehensive reform of the instruments for congestion, noise and air pollution is needed in the

transport sector – as these problems are not addressed adequately by a carbon price. For these issues, tolls or road-pricing measures, in particular for cities, are more appropriate alternatives to fuel-pricing policies. The configuration of various sectoral and cross-sectoral policy instruments and measures to complement carbon pricing should become the core task of future climate policy planning.

8. **Carbon pricing must be supplemented by a reform of energy taxes and levies.** The non-systematic development of taxes and levies in the transport and heating sectors in the past should be corrected, because it stands in the way of a cross-sectorally integrated energy transition. The reform options analysed in this document represent an important step in the transition of the energy tax system towards a consistent carbon pricing model. The electricity tax should be reduced to EU minimum rates. Ways of dissociating the components that distort competition from the price of electricity, such as grid charges and the levy resulting from the Renewable Energy Sources Act (EEG), should be examined to allow for efficient linking of the various sectors ('sector coupling'). These measures can be partly financed by the revenues from carbon pricing. The existing energy tax rates in the transport segment should be maintained until a comprehensive reform of the transport policy instruments is implemented. This will be conducive to internalize additional externalities in that sector (congestion, noise, air pollution, etc.) and prevent a short-term drop in tax revenues. The diesel tax rate should be aligned with the gasoline tax rate. In the long-term, a comprehensive tax reform is needed to address the declining tax base for fossil fuels.



Based on EVS 2013

Figure Z.4: Costs of carbon pricing reform for households in Germany under alternative refund options in 2030 (as a percentage of total household expenditure). The per capita refund is revenue-neutral for households and particularly relieves poorest households on average by 1.5 percent relative to their total consumption expenditure. There is little difference between the different refund options examined in this expertise. The coloured area of the bars shows 50 per cent of the households in each decile; the point shows the average cost; the long vertical lines show the burden on the remaining upper and lower 25 per cent of the households in each decile.

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9. **Carbon pricing reform should include a per capita refund for households (climate dividend).** Climate policy must be socially balanced. Tools for ensuring this exist: unlike regulation and subsidy programmes, introducing a carbon tax or emissions trading systems with auctioned allowances generates revenues for the state that can be refunded to households in a revenue-neutral manner, e.g. by paying a climate dividend and reducing electricity taxes. Low-income households would, on average, benefit economically from carbon pricing while financially stronger households would see their tax burden increase moderately (Figure Z.4). Even for highly affected households, the costs of an initial carbon price of 50 euros per tonne of CO₂ are typically less than 1 percent of the total consumption expenditure. Since all households receive the same amount of the climate dividend – regardless of the degree of CO₂-intensity of the goods they consume –, there are strong incentives to avoid carbon emissions and harness available sources of mitigation. For particularly affected groups, such as long-distance commuters, hardship clauses must be considered. In designing such exemptions, emission reduction incentives from carbon pricing should be maintained as much as possible.
10. **The competitiveness of the economy must not be disproportionately affected.** Many German companies can benefit from ambitious international climate protection because they offer and develop low-carbon technologies. Simultaneously, it is important to ensure that the German economy's competitiveness is not impinged upon, especially in the short term where other countries have not yet put ambitious climate policies in place. In order to avoid a shift in investment (and consequently emissions), even in the face of rising carbon prices, European as well as global cooperation is necessary. Given the delicacy of European, let alone global cooperation, companies in the transport and heating sectors could continue to receive, on a transitional basis, the existing, comprehensive energy tax exemptions within the carbon pricing reform until a specific cut-off date. In the meantime, it should be examined which sectors' competitiveness has actually deteriorated owing to carbon pricing and how they can be protected by means of appropriate compensation mechanisms that maintain emission reduction incentives to the greatest extent possible.

Carbon pricing reform in Germany requires bold political decisions. For the changes to take effect in a swift manner it is instrumental to clarify the upcoming implementation issues. **The planned Climate Protection Law should convey the necessary paradigm shift in German climate policy: carbon pricing as the core climate policy instrument supplemented by complementary policies and measures.** Following the imminent decision between a carbon tax and an emissions trading system, an interdepartmental task force, including experts and stakeholders, should be set up to work out the details of this reform and provide a peer-reviewed assessment of this report's proposals. Interim results should be discussed in a close sequence of public hearings to ensure quality and public support of the carbon pricing reform in Germany and Europe.