



## Comparing Carbon Pricing Models

### How can Germany Achieve its Climate Targets Sustainably?

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- ▶ Carbon pricing in sectors not covered by the European Emissions Trading System (EU ETS) are supposed to contribute to achieving Germany's climate targets. Two carbon pricing models dominate the current debate: a carbon tax and the expansion of the EU ETS.
- ▶ Introducing a carbon tax that is economically efficient, ecologically effective and socially viable is possible, but depends on two conditions: firstly compensation for the population and companies, secondly the integration of existing energy and carbon-related taxes.
- ▶ By its very nature, however, a carbon tax merely reduces emissions indirectly via price incentives.
- ▶ An emissions trading system is technically the most effective way to limit carbon emissions by setting a limit. A national emissions trading system (ETS) for the transport and buildings sectors could be a transitional solution.
- ▶ Given the simultaneous abolition and/or reform of existing regulations, subsidies, fees and levies, both a carbon tax and emissions trading system are preferable to the status quo in terms of climate change policy. Social compensation is essential for both.

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In the discussion on how the German climate targets can be achieved, calls for a more comprehensive carbon pricing are getting louder.<sup>1</sup> Although the European Union Emissions Trading Scheme (EU ETS) already constitutes a carbon pricing system for the electrical and industrial sectors and for intra-European aviation, it only covers about 40 percent of all emissions. The 2009 EU Effort Sharing Decision commits Germany to lowering its emissions in sectors not covered by the EU ETS (Non-ETS area: transport, buildings, agriculture) by 14 percent until 2020 and by 38 percent until 2030 (compared to 2005 levels).<sup>2</sup> Germany however might not fully achieve its 2020 targets and could get sanctioned. The Federal budget already assigns 300 million euros to the payment of fines for the period from 2018 to 2020.<sup>3</sup> If Germany also fails to meet its 2030 targets, the fines could go as high as 30 to 60 billion euros.<sup>4</sup> Two market-based pricing models dominate the discussion on how to avoid this scenario: introducing a carbon tax and expanding emissions trading.

## Carbon Tax

Introducing a carbon tax is the most prominent pricing model discussed in Germany and would entail the state setting a price per tonne of carbon emissions that applies to all sectors. As long as avoiding emissions is cheaper than paying the tax, the carbon tax is effective since polluters have incentives to use low-emission alternatives to avoid the tax.

Social viability is however crucial for the tax to work (as the yellow vest protests in France showed). Policy-makers need to be aware that the tax affects lower income groups disproportionately since expenditures on energy, heating and mobility are particularly high relative to income. Thus (partial) compensation of the population seems reasonable. Alternatively, existing taxes or the overall tax burden could also be reduced. Sweden provides a good example: When the local government introduced a carbon tax, it simultaneously reduced asset, capital and income taxes. In addition, companies facing international competition pay up to 60 percent less per tonne.

Switzerland which has also been imposing a carbon tax since 2008 tries to ensure social viability by means of transparency and repaying two thirds of the revenue via health insurance reimbursements. The remaining third is spent on emission reduction policies for buildings and research into climate-friendly innovations. Emissions-intensive companies can also be exempted from the tax by committing to reduce emissions.<sup>5</sup> About 4,000 industrial companies have thereby been reducing their CO<sub>2</sub> emissions by 30 percent since 2001.<sup>6</sup>

From an ecological point of view, the biggest shortfall of a carbon tax is that it merely indirectly limits the level of emissions (via incentives). If consumers are willing to pay a higher price, for example due to a lack of alternatives, these incentives could be too weak to adjust behaviour. This is particularly true in the transport sector, where the tax burden in Germany is already high and the existing "eco-tax" barely shows any steering effects.<sup>7</sup> Some experts

thus call for a German carbon tax of 20 euros per tonne to be gradually increased over time (as in Sweden, Switzerland or France). Others claim that a tax would only be effective if set above 50 euros per tonne.<sup>8</sup>

A carbon tax should hence meet several objectives: It should establish an appropriate level of taxation that promises the desired ecological effect, be socially viable and maintain international competitiveness. The latter in particular is intended to prevent companies from shifting their emissions, factories and jobs abroad (carbon leakage). A carbon tax should also avoid any additional administrative burden and at best even reduce bureaucracy. Two measures would be crucial to achieve these objectives:

1. Reforming or abolishing other levies and duties, compensating the population in a transparent way and granting exemptions for companies or sectors competing internationally;
2. Setting a taxation level and adjusting it regularly in order to ensure emissions reduction, adequate compensation and achieving climate targets.

## Emissions Trading Systems

In contrast to a carbon tax, emissions trading systems (ETS) are designed to cap emissions over a certain scope and period of time. Governmental authorities release allowances that give recipients the right to emit one tonne of carbon dioxide (or equivalent). These allowances are either given out for free, are sold or auctioned. Certificate auctions generate additional public revenue mostly spent on special climate protection schemes (promoting energy efficiency, renewable energies etc.). At the end of the trading period, market participants must hold sufficient certificates to cover their emissions – otherwise sanctions such as fines may be imposed.

An ETS also involves setting up a market for these allowances where demand and supply (rather than the government) determine the carbon price. During a trading period, market participants can buy or sell certificates according to their needs. Over the trading period, the legislator can influence the price by reducing the number of certificates, by determining a minimum price or price corridor, or by changing regulations, e. g. by giving credit for emissions savings realised outside the ETS area. Such interventions should, however, be considered carefully as they potentially increase uncertainty for businesses. Apart from this, the same conditions as for introducing a carbon tax apply.

Among emissions trading systems, there are two main allowance systems that potentially complement one another:

1. **Upstream:** Production companies and fossil fuel importers have to acquire allowances. By passing costs onto subsequent trading stages and eventually consumers, this approach has a similar effect to a carbon tax, the difference being the legislator not setting the price. The advantages of upstream ETS are low administrative and monitoring costs due to the comparatively small number of market participants,
2. **Downstream:** Consumers like power plant operators or car drivers are required to acquire allowances. Compared to an upstream system, this system can be introduced gradually in different sub-markets. In addition, plant-specific or sector-specific exemptions are easier to implement. The main disadvantage of a downstream ETS is the large number of market participants and the resulting administrative costs.

The EU ETS resembles a downstream system. It is the EU's central climate protection instrument for meeting its Kyoto Protocol climate targets between 2005 and 2020 and its Paris Climate Change Agreement targets from 2021 onwards. Critics often argue that the EU ETS prices carbon emissions too low, providing hardly any incentives to reduce emissions. However, the price for allowances is less a reflection of the EU ETS's functionality rather than the ambitiousness of the emissions cap set. After gradually removing surplus certificates from the market, the price for allowances has been increasing from seven euro at the beginning of 2018 to its current price of 25 euros. Due to the incremental certificate reduction, further price increases should be expected in the fourth trading phase starting in 2021.

## Comparison and Outlook: Taxation or Emissions Trading?

Since an ETS "cap and trade"-system limits emissions in line with climate targets, it is considered as an "accurate" instrument from an ecological perspective. From an economic point of view, an ETS will reduce emissions wherever it is most cost-effective. In addition, existing ETS can be integrated relatively easily. The International Carbon Action Partnership (ICAP) shows that the willingness for states to cooperate is greater on emissions trading systems than on taxes. Hence an ETS fosters international trade – an important factor in times of increasing protectionist tendencies. In terms of social viability, allowances auctions generate public revenue that enables regular reimbursements of the population.

## Designing a National Emissions Trading System

Given different attitudes among member states, expanding the EU ETS appears to be feasible only in the medium to long term, i. e. not in time for Germany to achieve its 2030 climate targets. Thus a national ETS in Germany (DE ETS) seems more feasible.<sup>9</sup> An DE ETS should be confined to the transport and buildings sectors and initiated as a closed system, i. e. separate from the EU ETS. Although increasing electrification (e-mobility and heat pumps) already leads to incremental integration of the transport and building sectors into the EU ETS, the intentional full integration would hardly reduce emissions in the foreseeable future: since costs for reducing emissions are particularly high in the transport sector, transport firms will rather buy up surplus certificates than reduce their emissions. In the medium to long-run, however, the corrective measures adopted in 2018 will remove this surplus. Germany would nevertheless still fail to meet its climate targets in the non-EU ETS sectors. The agricultural sector in particular would also require close coordination in terms of EU agricultural policy.

It would be possible to initially confine a DE ETS to electricity and heat generation not covered by the EU ETS (i. e. small installations in residential buildings etc.). This DE ETS would cover 40 percent of German greenhouse gas emissions in the non-EU ETS-sectors. If the transport sector was also included, this share would rise to 80 percent. In order to make the inclusion of the transport and building sectors feasible, an upstream system should be imposed<sup>10</sup> as industrial sites and refineries are already familiar with the EU ETS. A downstream ETS would be very hard to implement due to administrative costs for both government agencies and private households.

A DE ETS should be compatible with the EU ETS and potentially other EU member states' national ETS. Germany could also become an example for other states to follow. However, a DE ETS based on ambitious climate targets (such as the 2050 climate protection plan) would result in strong price increases, undermining public support unless adequate compensation was put in place. To avoid social distress, public revenue from auctioning allowances should be invested into a special fund (like the Energy and Climate Fund) to fund compensation measures.<sup>11</sup>

In conclusion, expanding the EU ETS to transport, building and agricultural sectors – initially in the form of a DE ETS as a transitional solution – seems a better approach than introducing a carbon tax. Both pricing schemes however can be effective market-based instruments, depending on policy design. Given the abolition and/or reform of existing regulations, subsidies, levies and contributions, both models are likely to be superior to the status quo as far as climate policy is concerned.

- 1 "CO<sub>2</sub>" refers to other greenhouse gases (GHGs) in addition to carbon dioxide, which are converted to CO<sub>2</sub> equivalents (abbreviated CO<sub>2</sub>e) for comparability reasons.
- 2 Moreover, in its 2050 climate protection plan, Germany sets itself the goal of becoming largely greenhouse gas-neutral by 2050. The interim target of reducing greenhouse gas emissions by at least 40 percent by 2020 compared with 1990 levels has clearly been missed; in contrast to the European targets, however, this purely national climate target is neither legally binding nor associated with sanctions.
- 3 Cf. Schlandt, J. (2019) "300 Millionen Euro: Deutschland verfehlt Klimaziele – und muss Strafe zahlen" (300 Million Euro: Germany misses climate targets – and has to pay a fine), Tagesspiegel. <https://www.tagesspiegel.de/politik/300-millionen-euro-deutschland-verfehlt-klimaziele-und-muss-strafe-zahlen/24118596.html> (last viewed on 04.06.2019).
- 4 Cf. Agora Energiewende/Agora Verkehrswende (2018) "Die Kosten von unterlassenem Klimaschutz für den Bundeshaushalt: Die Klimaschutzverpflichtungen Deutschlands bei Verkehr, Gebäuden und Landwirtschaft nach der EU-Effort-Sharing-Entscheidung und der EU-Climate-Action-Verordnung." (The costs of failure to protect the climate for the federal budget: Germany's climate protection obligations for transport, buildings and agriculture following the EU Effort-Sharing Decision and the EU Climate Action Regulation.) [https://www.agora-energiewende.de/fileadmin2/Projekte/2018/Non-ETS/142\\_Nicht-ETS-Papier\\_WEB.pdf](https://www.agora-energiewende.de/fileadmin2/Projekte/2018/Non-ETS/142_Nicht-ETS-Papier_WEB.pdf) (last viewed on 04.06.2019).
- 5 The 40 most energy-intensive companies are subject to their own ETS and are in any case exempt from the tax. All other companies can receive refunds by achieving individually agreed targets.
- 6 Cf. Minsch, R. (2019) "Wieso die Schweizer Wirtschaft so viel CO<sub>2</sub> einspart" (Why the Swiss economy is saving so much CO<sub>2</sub>), Neue Zürcher Zeitung. <https://www.nzz.ch/meinung/wieso-die-schweizer-wirtschaft-so-viel-co2-einspart-ld.1470516> (last viewed on 04.06.2019).
- 7 Cf. Weimann, J., quoted in C. Eisenring (2019) "Schweizer Ökobonus für die deutsche Energiewende" (Swiss eco-bonus for the German energy change), Neue Zürcher Zeitung, 07.05.2019: 27.
- 8 Graichen, P., quoted in M. Mirau & J. Schäfer (2019) "Kann man auf die Zukunft Steuern erheben?" (Can taxes be levied on the future?), FOCUS, No. 19 (04.05.2019): 40–41; cf. Agora Energiewende/Agora Verkehrswende (2019) "15 Key features for the Climate Protection Act." [https://www.agora-verkehrswende.de/fileadmin2/Projekte/2019/15\\_Eckpunkte\\_fuer\\_das\\_Klimaschutzgesetz/Agora\\_15\\_Eckpunkte\\_Klimaschutzgesetz\\_WEB.pdf](https://www.agora-verkehrswende.de/fileadmin2/Projekte/2019/15_Eckpunkte_fuer_das_Klimaschutzgesetz/Agora_15_Eckpunkte_Klimaschutzgesetz_WEB.pdf) (last viewed on 04.06.2019).
- 9 The Bundestag's scientific services are coming to the conclusion that the introduction of a national ETS would in principle be possible from (EU) legal points of view in national or EU-wide inclusion of other sectors in the European emissions trading system: <https://www.bundestag.de/resource/blob/554054/d82fa4578090812799515b50409f453e/wd-8-013-18-pdf-data.pdf> (last viewed on 01.07.2019).
- 10 The Federal Association for Emissions Trading and Climate Protection represents this proposal. A similar upstream integration of transport, households and small industrial emitters (less than 25,000 t CO<sub>2</sub> emissions per year) is used in California, for example.
- 11 Possible compensatory measures would be, for example, generalized reimbursement, an increase in the heating subsidy, a strong tax incentive to renovate buildings (especially for landlords), and obligations to renovate apartment buildings to save energy.

## Imprint

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