Assessment of the German climate package and next steps

Carbon pricing, social balance, Europe, monitoring

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In July 2019, the team of authors published a 100-page MCC-PIK expert report "Options for a carbon Pricing Reform" which was presented and discussed in the German Climate Cabinet a few days later. In its Cabinet meeting on 25 September 2019, the Federal Government adopted the "Climate Action Programme 2030" and, on that basis, on 9 October the comprehensive set of measures and a draft for the Climate Protection Act. Together, this is referred to as the "climate package". Based on July's report, this paper evaluates these decisions and, in particular, the new carbon pricing scheme in Germany.

Summary

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. Driven by this requirement and the strong demand for climate action by Germany's Fridays for Future protests, Chancellor Merkel installed the so-called "climate cabinet" with a round of ministers to find a strategy on how to reach the 2030 targets. On 20 September 2019 the climate cabinet agreed on the "Climate Action Programme 2030" (referred to as the "climate package"). It includes the introduction of a national carbon pricing system in the transport and building sector, which are not included in the European emissions trading system (EU ETS), and a policy package of incentives and regulatory measures across all sectors. The carbon pricing system starts with a fixed price of 10 euros per tonne CO2, and will rise to 35 euros per tonne by 2025, and then enabling the price to float in a fixed price band between initially 35 and 60 euros in a national ETS. Eventually, transport and building sectors shall be included into the EU ETS. The reform also envisages adding a floor price to the EU ETS. The policy package contains measures such as a "swap premium" for old oil-fired heating systems in buildings; a tax-deduction for energy-efficient retrofitting of buildings; public funding for charging points for electric vehicles; a buyer's premium for electric cars; and many more. A good summary of the whole package is given by Cleanenergywire (2019).

Based on our assessment, the climate package presented by the Federal Government is likely to be insufficient to meet the 2030 targets. A sensible structure for carbon pricing in the transport and heating sectors becomes apparent: A fixed price in the beginning, then a national emissions trading scheme for heat and transport in the medium term, and integration into the EU emissions trading scheme with a floor price in the long term. However, the price path is too low and does not reach far enough into the future for a sufficient steering effect to unfold and to provide the necessary investment security. With the price path that has now been set, it is expected that after 2026, substantial price increases will be necessary to achieve the target. This makes achieving the 2030 targets unnecessarily expensive. Furthermore, there is a risk that in the medium term (2022 to 2025) the price path may already lead to a violation of the EU Effort Sharing targets.

Additionally, the issue of social balance in German climate policy has not yet been solved satisfactorily. It is apparent that the middle class will be most heavily burdened, and while the burden on poorer households will be cushioned, their compensation is still insufficient: This is where cases of particular

hardship will occur. Social imbalance will worsen dramatically when carbon prices are rising, which is expected from 2026 onwards.

It is now important to make adjustments in the next steps: The carbon price path should be raised to an ambitious level enabling attainment of climate targets. In addition, climate policy instruments must be designed in a way that balances distributional outcomes. Furthermore, it is crucial that Germany takes a more active role in European climate policy. In parallel with its national introduction, Germany should push ahead with the introduction of an integrated Europe-wide carbon pricing system in order to prevent fragmentation and correspondingly high costs of European climate policy. The European climate debate on increasing the climate target for the year 2030, initiated by the new European Commission, will provide a good starting point for this in the near future.

An effective monitoring process is also crucial. The council of experts established under the climate package should not only support the ex-post monitoring of emissions, but should also have the right to propose adjustments to measures to achieve the objectives (*ex-ante* evaluation of alternative options). A reporting obligation to the Federal Parliament (Bundestag) would also be important in order to create transparency around progress towards achieving the targets. By contrast, the currently envsiaged council of experts only has a weak mandate to merely verify data and model assumptions. However, the committee should not just certify the progress with regard to the climate targets, but should serve as the pacemaker for their implementation. The Federal Government missed the opportunity to create a strong institution.

1. The introduction of national carbon pricing is too timid

Decision of the Federal Government: *"The national emissions trading system will be launched in 2021. A fixed price per tonne CO_2 will be specified in advance. Certificates will be sold to companies selling heating fuel and fuel for vehicles. The costs of the certificates will then be carried by the fuel trade. When a company sells heating oil, liquefied petroleum gas, natural gas, coal, petrol or diesel, it will need one certificate for every tonne CO2 emitted by the products they sell. The fixed price will initially be 10 euros per tonne CO_2, and will rise to 35 euros per tonne by 2025. […] As of 2026, the market will set the price, within a fixed band [of 35 and 60 euros]. [In 2025 it will be decided to what extent maximum and minimum prices for the period from 2027 are reasonable and necessary.]"* (Bundesregierung 2019a; 2019b)

Evaluation

With the climate package, the introduction of a carbon pricing architecture for the non-ETS sectors transport and heat has been decided. In our report, we also recommended this and qualified this approach as a viable option, see MCC-PIK Report p. 48 (Edenhofer et al. 2019a)[1]. This includes (1) the introduction of carbon pricing with a fixed price initially in order to initiate carbon pricing quickly, (2) the transition to a national emissions trading system (ETS) with a price corridor consisting of a floor price (to stabilize investment decisions) and a maximum price (to avoid political upheaval in the event of very high prices) and (3) the inclusion of all sectors in the EU ETS with a floor price in the long term (see Chapter 3).

[1] An English version of the Executive Summary is available in Edenhofer et al. (2019b).

However, due to its low initial amount of 10 euros, increasing to 35 euros by 2025, carbon pricing will initially have little steering effect. Since the development of carbon pricing after 2026 will only be determined in 2025, there is no long-term planning and investment security. As a result, the carbon price will only have a very small impact on investment and innovation. Instead, a variety of other measures and incentives are designed to reduce emissions and channel investment. However, the effective contribution of these emission reduction measures is as unclear as their distributional effects. The carbon price will thus not become the core instrument of climate policy: German policy puts too little emphasis on cost-effective market incentives. On the one hand, this may result from the low level of confidence in their effectiveness, on the other hand, it may be due to the feared social or economic upheaval in the case of prices that are too high. Both concerns are unfounded. While the adopted social balance measures are indeed inadequate, a higher reimbursement could have counteracted this (see Chapter 2).

Politics avoided a clarification of the carbon pricing path after 2026. But significant price increases after 2026 seem especially necessary if the 2030 targets are to be achieved (see Figure 1). The longer the increase in carbon prices is postponed, the higher the prices will have to rise each year to meet the EU targets that have been set. However, this just adds to the challenge of achieving social balance and creating planning security for investments. This requires a long-term, sufficiently high, increasing price path, which is then adjusted in the event of unexpected developments according to clearly defined criteria (see Chapter 4).

Price path of carbon pricing in the non-ETS sectors

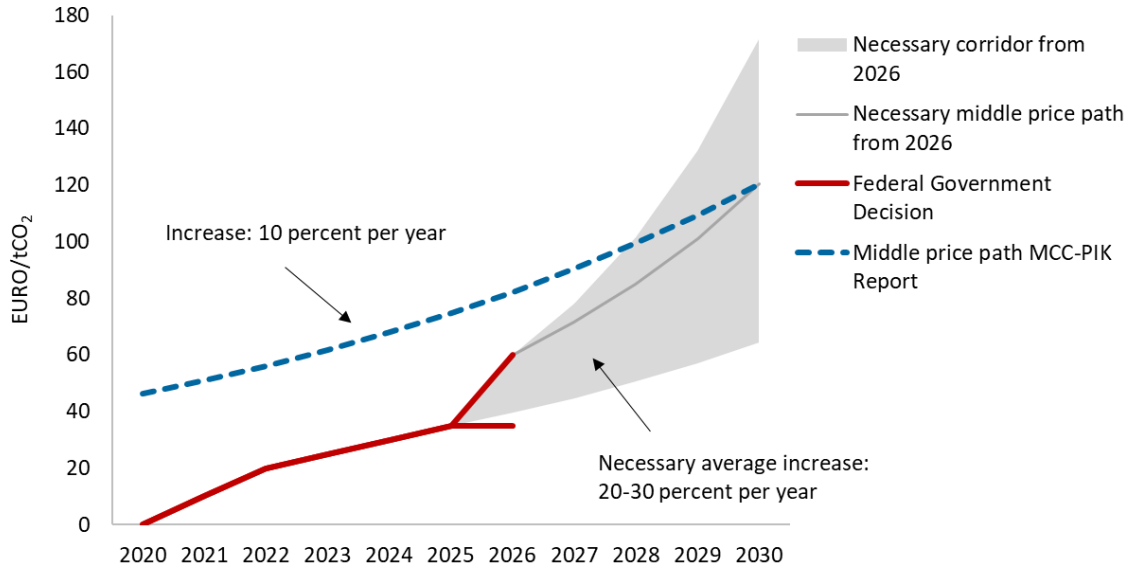

Figure 1: Comparison of the price path decided by the Federal Government (red) with the price suggested by the MCC-PIK Report (blue dashed line). From 2026, the necessary price corridor (grey) in order to reach the same price level in 2030 as in the MCC-PIK Report is indicated. The prices shown refer to a carbon price, which – as decided by the Cabinet – will be added as a surcharge to the current energy taxes. The MCC-PIK Report recommended that the carbon price should only be added as a surcharge in the transport sector, but offset against existing energy taxes in the heating sector; therefore, in the case of universal added surcharges, a price path that is slightly lower than the one mentioned in the MCC-PIK Report is sufficient to achieve the 2030 targets in the transport and heating sector: 46 instead of 50 euros/tCO_2 in 2020 and 120 instead of 130 euros/tCO_2 in 2030, with an annual increase of 10 percent. In addition, it is also necessary to adjust for inflation. If, in addition, the annual targets under the EU Effort Sharing Regulation are exceeded by 2026, even higher growth rates for the carbon price could be necessary after 2026 in order to compensate for the exceedances.

The climate package also stipulates that if the targets are not achieved within Germany, certificates will be purchased from other EU member states: *"If more certificates are issued in a year than equate to Germany's emission allocations, more must be purchased from other European member states."* However, it must be taken into account that the possibility of substantial acquisitions in other European countries in the non-ETS area is very uncertain: All analyses indicate that it is also difficult to comply with the objectives of the Effort-Sharing Regulation in other EU countries (Duwe et al. 2019; European Environment Agency 2018). Politicians should therefore first consider raising the price level or expanding national measures before planning a European purchase of certificates. In this case, they should also allow a maximum price higher than 60 euros/tCO_2 in 2026. Settling on the possibility of purchasing certificates from other EU countries is not enough.

The question of a comprehensive energy tax reform has remained completely unresolved in the government decision. However, this would be important in order to set a harmonized carbon price signal and to stimulate the most favourable avoidance options. For example, heating oil and heating gas as well as diesel and petrol continue to be subject to different energy tax rates (see MCC-PIK Report p. 46/47). The carbon price will then be added to the different tax rates. Energy taxes have not been adjusted to inflation since 2003 and have therefore fallen in real terms.

The way in which the carbon price is now implemented can be understood as one measure among many others. Thus, it can easily degenerate to an alibi measure, if policymakers do not muster the courage to raise prices. Instead, a significant carbon price could have become the core instrument of climate policy – and then provided the main incentive to reduce emissions and invest in climate-friendly measures. Further action would then only be needed to address specific incentive problems (e.g. information deficits, landlord-tenant dilemma, credibility issues of the government's self-commitment) and for public sector investments. Although in the text of the climate package the carbon price acts as a preamble, negotiations took the opposite approach: First, regulatory and funding measures to reduce emissions were set, then the price was negotiated to fill the remaining gap.

The many measures proposed in addition to the carbon price are, in principle, useful where infrastructure issues or investment decisions in the public sector (such as public housing stock) are concerned. For many of the other proposed measures, however, it is unclear what effect they will actually have in mitigating CO_2: A higher price of carbon would likely achieve this reduction at lower economic costs. Furthermore, higher deadweight losses could occur, which increase the costs per tonne of the CO_2 that is avoided. Furthermore, there is no estimation of the distributional effect of the individual measures (see Chapter 2).

In order to achieve the climate targets, it is necessary that an increase in the price level now occurs through the political process or monitoring (see Chapter 4). After all, a viable structure for carbon pricing in Germany has now been outlined.

2. Improvements to the social balance must be made

Decision of the Federal Government: *"In the medium term the German government will reduce electricity prices as a counterweight to the new CO2 pricing. [From 2021, the feed-in tariff levy will be reduced by 0.25 cents per kWh. As the carbon pricing path progresses, the reduction will be 0.5 cents per kWh in 2022 and 0.625 cents per kWh in 2023.] As of 2021 commuters will be able to offset a higher sum if they live further away from their place of work. As of a distance of 21 kilometres, they can offset*

35 cents per kilometre. This rule will expire at the end of 2026. […] To avoid social hardship, the German government will increase housing benefit by 10 per cent. Users of public transport will also benefit from financial relief. People taking the train for longer distances will in future be able to do so more cheaply, as VAT will be charged at 7 per cent rather than 19 per cent." (Bundesregierung 2019a; 2019b)

Evaluation

The distribution effects of the decision are examined below based on the model that was developed in the MCC-PIK Report (Chap. 8). Initially, the carbon price, due to its low level, will not lead to any noticeable additional burdens. For example, a price of 10 euros/tCO_2 costs a family of four earning a middle income on average only around 6.50 euros per month in the countryside and around 6 euros per month in the city. The absolute costs increase with the size of the household as well as with income, because the energy consumption increases significantly (see Figure 2a, red line). However, poorer households spend a particularly high proportion of their income on energy. In percentage terms, low and middle income households are most heavily burdened when no compensations exist (Figure 2b and MCC-PIK Report Figure 8.1).

Distributional effect of the carbon price in 2021

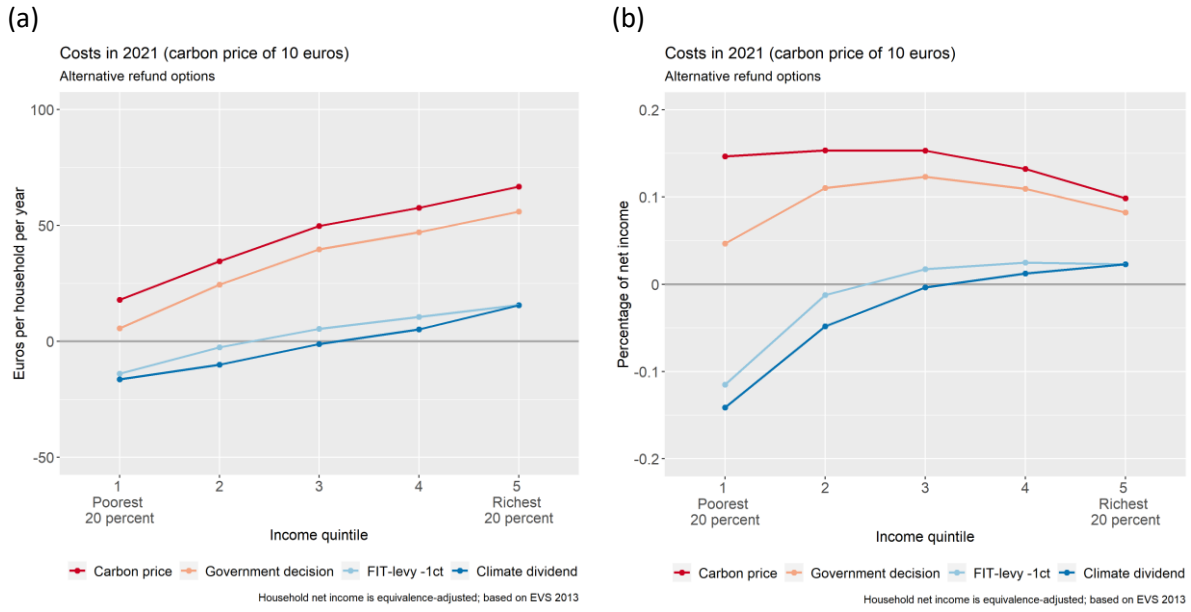

Figure 2: (a) Absolute burden in euros per month per income group and (b) relative burden as a percentage of net income from the introduction of a carbon price of 10 euros/tCO_2. The burden due to the introduction of a **carbon price** (red) and alternative refund options are shown: 1) reduction of the feed-in tariff levy by 0.25 cents/kWh per 10 euros carbon price, increase of housing benefit and adjustment of welfare recipients' heating cost reimbursements as intended in the **government decision** (orange), 2) reduction of the **feed-in tariff levy** by 1 cent/kWh per 10 Euro carbon price and adjustment of welfare recipients' heating cost reimbursements (light blue) as well as 3) the per-person income-neutral reimbursement via a uniform **climate dividend** as recommended in the MCC-PIK Report (dark blue). The impact of the subsidy programmes and the increase in the commuter allowance have not been taken into account.

The initial net impact of the carbon price, taking account of compensation measures provided in the climate package, is shown in Figures 2a and 2b as an orange line. The planned moderate reduction of

the electricity price, the increase in housing benefit and the adjustment of the heating cost reimbursement for recipients of benefits were taken into account, but not the increase in the commuter allowance (more on this below). Overall, this will only marginally offset the loss of income due to the carbon price and, overall, high-income earners will be less heavily burdened than the middle class.

Distributional effect of the carbon price in 2026

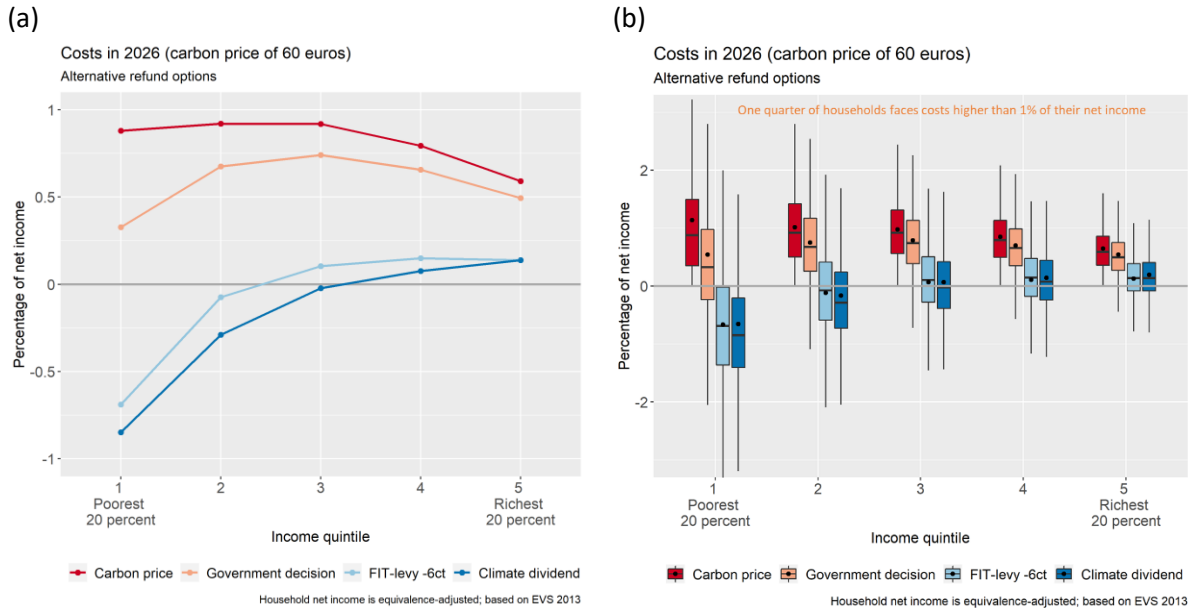

Figure 3: (a) Relative burden in percentage of net income per income group and (b) the spread of the relative burden within the income group at a carbon price of 60 euros in 2026. The burden of a **carbon price** of 60 euros in 2026 (red) and various reimbursement options are shown: 1) reduction of the feed-in tariff levy by 0.25 cents/kWh per 10 euros carbon price, so 1.50 cent/kWh per 60 euro carbon price, increase of housing allowance and adjustment of welfare recipients' heating cost reimbursements as intended in the **government decision** (orange), 2) reduction of the **feed-in tariff levy** by 1 cent/kWh per 10 Euro carbon price (in this case therefore 6 cents) and adjustment of welfare recipients' heating cost reimbursements (light blue) as well as 3) the per-person income-neutral reimbursement via a uniform **climate dividend** as recommended in the MCC-PIK Report (dark blue). The impact of the subsidy programmes and the increase in the commuter allowance have not been taken into account. In (b), the thick bars are the middle 50 percent of each household group, the thin bars are the rest except for statistical outliers (deviation greater than 1.5 IQA). The dot is the respective average.

The two additional curves mark the net burden in the case of a revenue-neutral reimbursement of the revenue to households – which is not provided for in the climate package: either exclusively via a substantial reduction of the electricity price, via the financing of the feed-in tariff levy (resulting from the Renewable Energy Sources Act, EEG) with corresponding adjustment of the heating cost reimbursement to welfare recipients (light blue) or, similar in its result, via the uniform reimbursement to each citizen as a "climate dividend" as described in the MCC-PIK Report (Chap. 8) (dark blue). These variants would both have had a strong progressive effect. The danger of burdening poorer households, which was frequently invoked during the political debate, could have been avoided. This also applies to the effects in 2026, the end of the period specified in the government decision, even if the carbon price were to reach the upper end of the given price corridor. The corresponding results for the four scenarios are shown in Figures 3a (as an average) and 3b (taking into account the distribution within the

income group) and again clearly show the disproportionate burden on the middle class resulting from the government decision.

In summary: The government's announced relief with regard to electricity prices and higher social transfers is not enough in itself to offset the burdens of a potential future carbon price of 60 euros. A large proportion of low-income earners who do not receive welfare or housing allowances and do not benefit from the respective relief measures will be significantly burdened by the climate package: About a quarter of households in the lowest income group will pay more than 1 percent of their income due to the government's proposal (Figure 3b). A substantial reduction in electricity prices financed via feed-in tariff levy as an alternative reimbursement option would have considerably relieved lower incomes in particular.

The increased commuting allowance for long-distance commuters provided for in the climate package as a further relief measure also does not help lower-income groups (see Figure 4). This is because the offset for commuting increases with higher income due to the increasing tax benefit. In particular, well-paid commuters who commute over long distances are overcompensated during the first years of the reform: They save more taxes than the extra amount they pay for petrol. This again shows that social balance is not guaranteed with increasing carbon prices over time.

Burden for car commuters (euro/year) due to carbon price with increase of commuter allowance

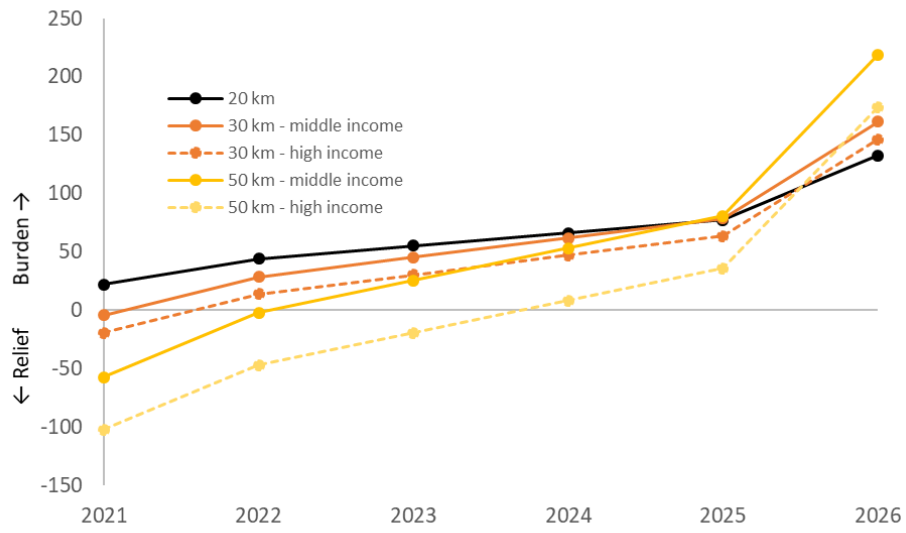

Figure 4: Net burden of car commuters due to increased fuel costs and increase in the commuter allowance from the 21st kilometre taken into account. Exemplary calculation for a diesel car (consumption: 7 litres per 100 kilometres) at a marginal tax rate of 42 percent (high income) and 30 percent (median income).

The distributional effects of subsidy programmes and measures in the building and transport sector are difficult to estimate. In the case of measures that are linked to a tax subsidy, similarly to the commuter allowance, those earning more money are relieved to a greater extent. An assessment should be made whether such measures can be better targeted – for example by restricting them to low-income households. In addition, clarification is necessary as to whether there are more effective incentives in the building sector than broad-based subsidy programmes, such as adjustments in tenancy law regarding the ability to reimburse energy-efficient renovations or the survey of energy related rent

indexes (Kossmann, von Wangenheim, and Gill 2016; Gill, Kossmann, and von Wangenheim 2016; Klinski 2010).

Overall, the measures adopted will harbour a social explosive force in the medium to long term when carbon prices are rising. This is because there is no broad compensation mechanism that benefits low and average earners in particular. Limiting the subsidy programmes and measures could allow a larger share of carbon pricing revenues to be used to provide general relief for the population. This would also be possible. If the government, in the form of a reduction of the feed-in tariff levy and electricity tax, would reduce the electricity price four times as much as previously planned, this would achieve a socially balanced reimbursement. When carbon prices exceed 70 euros, however, limits are reached, because the feed-in tariff levy and electricity tax cannot be reduced to negative values. Alternatively, the revenue could then be distributed as a uniform per-capita climate dividend: At a carbon price of 60 euros/tCO_2, this would amount to 150 euros per person per year. Because the revenue-neutral climate dividend automatically adapts to the carbon price, this guarantees a socially balanced reimbursement even with rising carbon prices. Given that the additional administrative burden of introducing a climate dividend would be significant, this option would only become an attractive reimbursement model for higher carbon prices. Politicians could therefore start now to create the administrative conditions early on, for example through health insurance (Ismer et al. 2019), to make this possible from 2026.

3. Need for advancing European integration

Decision of the Federal Government: *"The Federal Government will work in close cooperation with the European Commission to introduce a European-wide emissions trading across all sectors. In a first step, the existing European emissions trading scheme (for energy and industry) should be supplemented by a moderate European floor price. [...] In a second step, in alliance with other willing member states, we will work towards the prospect of integrating the non-ETS sectors into the ETS."* (Bundesregierung 2019b)

Evaluation

In addition to the need for a national introduction of carbon pricing, the Federal Government has recognized that ambitious climate protection requires increasing integration into European climate policy. The decision to work towards the introduction of a floor price in the EU ETS is also an important course of action. These fundamental decisions are welcomed and were also proposed in the MCC-PIK Report (pp. 60 ff. and Chap. 4).

Strategically orienting climate policy on the European level in non-ETS sectors is a paradigm shift in German climate policy. However, an active political approach is now required so that the desired integration can be achieved in the near future. At the European level, the envisaged greater reduction of emissions by 50 or even 55 percent by 2030 has created a dynamic that opens up a window of opportunity for timely reforms. The time until the year 2026 should be used to actively promote a comprehensive European emissions trading system and to then decide whether it may be possible to abandon the establishment of a national emissions trading system and to move straight to European integration. The German approach should therefore be coordinated at an early stage with similar concepts in other EU member states to avoid a growing patchwork of incompatible national approaches (Braun, Pahle, and van Bracht 2019; Edenhofer and Schmidt 2018).

Implementation of a floor price in the EU ETS

The key function of a floor price lies in stabilizing price expectations and thus creating a reliable regulatory framework for investments in low-carbon technologies (Fuss et al. 2018; Flachsland et al. 2019). The floor price would also be a sensible measure in safeguarding the German phase-out of coal that is decided to happen by 2038 at latest (MCC-PIK Report Chap. 4, Pahle et al. (2019), Matthes et al. (2019)) – especially since the climate package does not foresee deleting certificates to avoid the waterbed effect.

An ETS floor price can be introduced in various ways (Edenhofer et al. 2017; Acworth et al. 2017). For example, the North American ETS systems in California and the north-eastern states (Regional Greenhouse Gas Initiative, RGGI) use a minimum price for the auctioning of certificates, analogous to a floor price in eBay auctions. In the UK, a floor price is implemented through a mark-up on the certificate price, which must then be adjusted according to the actual certificate price (Hirst and Keep 2018). If several countries jointly implement a floor price, the distributional question always arises as to which EU Member States carry which burden from removing allowances.

An EU-wide implementation would be ideal for distributing this burden broadly and fairly. In the past, compromises on the distribution have been found repeatedly when it came to reforming the EU ETS (Dorsch, Flachsland, and Kornek 2019). But an introduction by a coalition of Member States, such as Germany, the Netherlands and France, is also conceivable. If the floor price was activated, then emission rights would be withheld, thus creating a shortage in the market. As a result, the certificate price would increase throughout the entire EU ETS. However, in this case, only the implementing Member States would bear the corresponding costs (Pahle et al. 2018).

It is still unclear which EU ETS floor price the government considers “moderate." It would make sense to start at around 25 euros/tCO_2 to safeguard the current price level. The floor price would then increase over time.

Implementation of a cross-sectoral expansion of the EU ETS

The Federal Government is in favour of an EU-wide integration of the transport and heating sectors into the EU ETS. However, the implementation of this promising measure involves considerable distributional challenges, similar to the introduction of a floor price. In addition to an EU-wide approach, there is also the opportunity of leading the way with an initial coalition of the willing.

In order to push ahead with a floor price and the sectoral expansion of the EU ETS and to adapt EU legislation accordingly, there are three key procedural entry points for the coming years:

- First, the above-mentioned increase of the ambition level of the EU's 2030 climate target to 50 or 55 percent (von der Leyen 2019). A floor price and sectoral enlargement could be introduced within this process. In principle, the more ambitious reduction target can be achieved by increasing the reduction target in the EU ETS through an increase of the linear reduction factor, and by raising the targets in the non-ETS sectors accordingly. It can be assumed that the European Council will decide on the new long-term target for 2050 at its next summit at the end of 2019 and develop appropriate implementation strategies from 2020 (Geden and Schenuit 2019). This will most probably result in more ambitious 2030 targets for Germany, which will require a higher carbon price level.
- Second, the next "regular" reform of the EU ETS with the Assessment of the Market Stability Reserve (MSR) in 2021. In this context, the MSR quantity trigger activating allowance removal

into the reserve could be converted to a price-trigger, thus introducing a floor price via adjustment of the MSR.

- Third, the next revision of the Effort Sharing Directive (ESD) and the EU ETS. The integration of non-ETS sectors into the EU ETS should be established at this point at the latest. In fact, this step might be needed sooner than expected. If Germany does not achieve its European objectives in the non-ETS sectors (minus 38 per cent by 2030 compared to 2005), generally speaking, corresponding certificates (AEA) must be purchased from other Member States. But as already stated, it is still unclear whether sellers will even be found. An alternative approach would be to purchase certificates from the EU ETS instead. This is currently only possible to a limited extent – but the existing flexibility mechanism could be expanded. In doing so, the distributional consequences must again be considered: Purchases from the EU ETS would lead to price increases there. Flexibilisation between the EU ETS and the non-ETS sector would also provide the opportunity for the EU ETS price to serve as a guide for the German carbon price in the non-ETS sectors after 2026.

These reforms have distributional effects. In particular, higher EU ETS certificate prices affect the industrial sector, which is also being protected less and less from higher carbon prices and energy costs by national compensation mechanisms. Countermeasures can be taken through the following three measures:

- Introduction of a Carbon Border Tax as planned by the EU Commission and recently supported by France and Germany in a joint statement (Bundesministerium der Finanzen 2019). The implementation proposals made to date involve considerable practical difficulties. An actionable proposal should be developed quickly. One possible entry point is the German EU Council Presidency in the second half of 2020.
- Introducing a maximum price in the EU ETS, as proposed by the MCC-PIK Report for the national emissions trading system. This could be part of the MSR's above-mentioned assessment. Within the scope of Germany's EU Council Presidency in the second half of 2020, preliminary steps on the distributional questions and the institutional structure could be clarified.
- Exemptions for industry. At least at the German level, the burden on industry could be "controlled": by adjusting the electricity price compensation in the ETS or the peak compensation according to the Energy Tax Act (EnergieStG)/Electricity Tax Act (StromStG). The Commission's new aid guidelines, which are expected in 2020, are fundamental to this.

Overall, it is a positive step that the Federal Government envisions the European level for the implementation of Germany's climate targets and as a convergence point for the future institutional architecture. However, in order to achieve a real paradigm shift, German policy must now actively shape European climate policy and bring forward the necessary processes. Otherwise, the paradigm shift will turn into lip service.

4. The design of the monitoring is crucial

Decision of the Federal Government: *"The Federal Government will determine compliance with the climate targets in 2030 as a whole and the progress made in the individual sectors each year and have them accompanied by an external council of expert. The Federal Government thus creates objectivity on the achievement of the climate targets." "§ 12 Tasks of the council of experts for climate issues: (1) The council of experts for Climate Issues shall assess the emission data [...]. (2) Before preparing the*

draft resolution for the Federal Government on the measures [...], the council of experts for climate issues shall assess the assumptions on greenhouse gas reduction on which the measures are based. (3) For the following measures, the Federal Government shall seek an opinion from the council of experts for climate issues with regard to the underlying assumptions on greenhouse gas reduction [...].” (Bundesregierung 2019b; Bundesministerium für Umwelt, Naturschutz und nukleare Sicherheit 2019)

Evaluation

The way in which the council of experts is set up with regard to monitoring is crucial to ensure the effective further development of the climate package. To facilitate monitoring, evaluation, learning, and forward-looking policy advice, three aspects are central for the council of experts: the mandate, reporting, and composition of the council of experts.

The **mandate** of the council of expert should be to evaluate the effectiveness and efficiency (cost) of the implemented emission reduction policies. Additional evaluation criteria include distributional impact and economic competitiveness. However, it is crucial that not only *ex-post* monitoring of the measures is carried out, but that the council also has the right of proposal to make adjustments in order to achieve the objectives (*ex-ante* evaluation of alternative options). Therefore, the council should analyse additional policy measures as well as be able to create scenarios to deliver forward-looking policy recommendations. These include, in particular, concrete proposals to adjust the price path for CO_2 to ensure the effectiveness of policies, as well as proposals for complementary policies in areas where the carbon price is insufficient. It is crucial that the council evaluates various options so that politicians will receive a map of alternative pathways and can make an informed decision on this basis. The results of the analyses should be publicly available and subject to a peer-review process to ensure a transparent societal debate (a social learning process) as well as quality assurance.

Reporting on the progress of compliance with the climate targets, including policy recommendations, should be made at regular intervals, with reporting obligations to the Bundestag. The latter aims to create transparency about the effectiveness of the climate package and to stimulate the parliamentary debate on any necessary adjustments to measures and the carbon price path. A legal duty of the government to respond to the Commission's reports and to publish this response (as is already the case with the reports of the German Council of Economic Experts) will give more weight to the council's proposals.

The **composition** of the council with experts from various fields, including economics, energy, social sciences and law, is an important criterion for mapping all relevant dimensions of climate policy. Experts on empirics should also be included in this council so that they can evaluate the effectiveness of the adopted measures. Competencies are also relevant to econometric modelling to create projections for the future. Scientific staff and funds for commissioned studies should also be part of a functioning council in order to make the best possible use of the existing expertise in climate policy research in Germany.

From an administrative point of view, it is important to co-ordinate with the already existing Monitoring Commission, which is based at the Federal Ministry of Economics, with the newly emerging “Wissenschaftsplattform Klimaschutz” (Climate Protection Science Platform), which is based at the Ministry of Research and Environment, so that strengths and debates are pooled. However, as described above, it would be necessary to substantially expand the mandate for these existing institutions. In addition, the monitoring created in the Coal Commission’s recommendations should be coordinated with the new council of experts. In order to be truly able to act, the council of experts should be equipped with a secretariat and with a sufficient budget to, for example, commission modelling work.

Example UK Committee on Climate Change

The UK Committee on Climate Change, which is of great importance for climate policy in Great Britain, can inspire the design of the German council of experts. Its mandate is to evaluate and monitor progress in emission reductions, and to report on the remaining CO_2 budgets for set five-year periods. Furthermore, the committee performs independent analyses in the field of climate sciences, economics and politics and on this basis makes concrete recommendations for emission reduction targets in the form of future five-year budgets. The government, in turn, has a legal obligation to respond to these annual reports. Reporting to Parliament takes place annually, which stimulates public debate. The composition of the UK Committee on Climate Change includes 8 experts on climate change, science, economics, behavioural science and business administration, with the additional support of a secretariat of approximately 30 professionals and an annual budget of approximately 3.7 million British Pounds. The majority of the recommendations are also implemented politically (Averchenkova, Fankhauser and Finnegan 2018). Its relevance can also be explained by its broad range of activities – from analysis and evaluation of greenhouse gas emissions to model calculations and the modelling of long-term scenarios. This all results in a constant and intense dialogue with stakeholders and the government.

None of these components are included in the council of experts' mandate now agreed upon by the German Government. The council of experts is envisaged to only "assess data" and “assess the underlying assumptions" of emissions data, but shall not evaluate and propose measures. In addition, there is no obligation to report to the Bundestag, which would create transparency – this is precisely what the parliamentarians, for their own sake, should urgently demand in the upcoming legislative process. The example of the UK Committee on Climate Change (see text box) shows how it is possible to be very successful in climate protection with a well-equipped commission.

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