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Clash between National and EU Climate Policies – the German Climate Levy as a Remedy?

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1. Introduction

This policy brief explores the potential scope and optimal design of national climate policies in the European climate policy context. It argues that the recent German proposal of a climate levy for electricity generators (BMWi 2015) has the potential to reconcile EU and national policies.

Section 2 starts with a brief introduction into the present EU climate policy regime and the rationale of national climate policies in this framework. The bottom line is that the current setting basically justifies national targets and policies only for the sectors that are not already covered by the European emissions trading scheme (EU ETS). Section 3 discusses the deficiencies of the EU ETS which is the major reason why additional national polices for the EU ETS sectors can still be justified. Section 4 focusses on how such national policies should be designed. Section 5 takes the proposed German climate level as an interesting example of a new type of national policy and discusses how it could be optimized. Section 6 summarizes and concludes.

Already in the Kyoto Protocol from 1997 the European Union member states made use of the provision to fulfill their greenhouse gas (GHG) emission commitments jointly. They agreed on a collective target to reduce GHG emissions in the first commitment period of the Protocol from 2008–2012 to 8 percent below 1990 levels. Also for the second commitment period from 2013–2020, the EU intends to fulfil its emissions reduction commitment jointly for the now 28 member states and Iceland. Economists appreciate such a joint target since it opens the way to implement an efficient EU wide climate policy that aims at reaching this target at minimal costs.

A cornerstone of the European Union's policy to combat climate change and its key tool for reducing industrial GHG emissions cost-effectively is the EU ETS. It covers more than 11,000 power stations and industrial plants in 31 countries, as well as airlines. It is currently the largest ETS world-wide and may thus be regarded as a very important step towards efficient (European) climate policy.

Note that this version is a corrected version from October 2015.

Yet, the system produces large inefficiencies since only about half of EU GHG emissions are covered by the EU ETS, while there are national targets and national measures for the remaining emissions. Böhringer et al. (2009) show that the inefficiencies of such separated carbon markets can be significant. One reform proposal for the EU ETS is thus to extend its scope to more sectors and regions. It would be beneficial if there is in the long-run only one carbon price in the EU and an overall coherent European climate policy.

Most scientists and many practitioners agree that the EU ETS needs to be reformed also in additional respects. Though it is generally functioning, allowance prices have remained below 10 €/tCO_2 since late 2011 and hardly reach more than 5 €/tCO_2. At the same time, additional national climate policy measures are undertaken or discussed in different countries – not only for the non-ETS sectors which would fit to the current framework – but also for ETS sectors. The UK for example has implemented a minimum price of now 30 €/tCO_2 for their electricity generators participating in the EU ETS in April 2013. In December 2014, Germany has agreed on an action program (BMUB 2014a) because it is likely to miss the national target to reduce greenhouse gas emissions by 40 percent relative to 1990 until 2020. It stipulates to reduce greenhouse gas emissions of the German power sector to 290 MtCO_2 in 2020 which implies an additional emission reduction relative to existing recent government forecasts (Bundesregierung 2015) by at least 22 MtCO_2.

2. National climate policy only for emissions not covered by the EU ETS

Given the current European climate policy framework that includes the EU ETS as its main instrument, the question is which role national climate policy in the EU member states still can and should play. In the current EU climate policy framework national emission targets only make sense for the sectors / emissions not covered by the EU ETS. Accordingly, there is one overall EU emission target for the EU ETS emissions and national targets specified in the Effort Sharing Decision (European Commission 2013a, 2013b). They vary between an increase of emissions until 2020 relative to 2005 by 20 percent (Bulgaria) and a reduction in the same time period by 20 percent (Denmark, Ireland, Luxemburg). Germany needs to reduce its non-ETS emissions by 14 percent (Table 1).

More ambitious national targets for the non-ETS emissions are always possible and would not counteract with European climate policy. If they are reached they also lead to a lower EU emission level. For efficiency reasons national climate policies in non-ETS sectors should aim for (implicit) carbon prices that are comparable to the EU ETS allowance price.

National targets for the EU ETS sectors are generally problematic. The mechanism of emissions trading implies that actual emissions depend on where emission reductions are cheapest and how much emission allowances are traded. National emission within the EU ETS can thus not be prescribed but emerge endogenously through the allowance market dynamics. In the first phases of the EU ETS when emission allowances were still mostly grandfathered it would have made sense to define national emission of the EU ETS sectors

as the amount of grandfathered allowances. Now that an increasing share of allowances are auctioned this is not possible anymore. Currently, the amount that is auctioned by national governments is very limited and mostly set for burden sharing considerations (see Article 10 European Parliament 2009).[1] In the next decade the plan is that 90 percent of the allowances to be auctioned will be distributed to EU Member States on the basis of their share of verified emissions, while 10 percent will be allocated to less wealthy EU Member States. Yet, this rule is also set to distribute revenues in a fair sense rather than to define national emission levels.

Table 1:
Member State GHG emission limits in 2020 compared to 2005 GHG emission levels

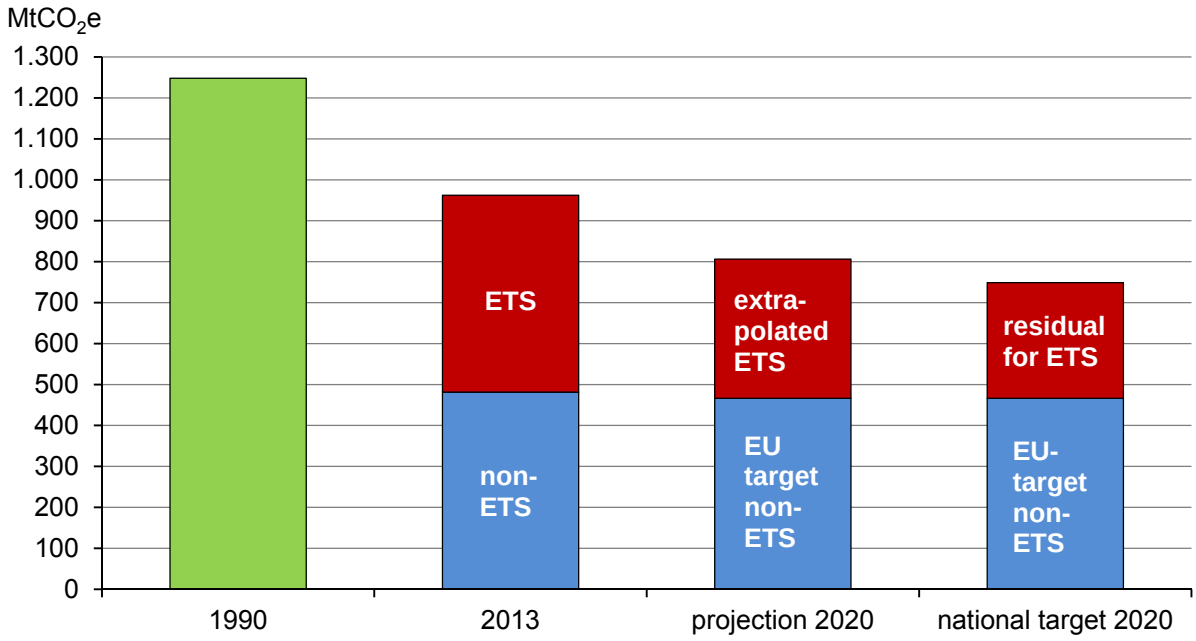
	percent
Belgium	–15
Bulgaria	20
Czech Republic	9
Denmark	–20
Germany	–14
Estonia	11
Ireland	–20
Greece	–4
Spain	–10
France	–14
Italy	–13
Cyprus	–5
Latvia	17
Lithuania	15
Luxembourg	–20
Hungary	10
Malta	5
Netherlands	–16
Austria	–16
Poland	14
Portugal	1
Romania	19
Slovenia	4
Slovakia	13
Finland	–16
Sweden	–17
United Kingdom	–16

Source: European Commission (2013b).

[1] "Pursuant to Article 10(1) of the ETS Directive 88 percent of the allowances to be auctioned in 2013 to 2020 are distributed to the EU Member States on the basis of their share of verified emissions from EU ETS installations in 2005 or the average of the 2005-2007 period, whichever one is the highest. Ten percent are allocated to the least wealthy EU member states as an additional source of revenue to help them invest in reducing the carbon intensity of their economies and adapting to climate change. The remaining 2 percent is given as a 'Kyoto bonus' to nine EU Member States which by 2005 had reduced their greenhouse gas emissions by at least 20 percent of levels in their Kyoto Protocol base year or period. These are Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania and Slovakia." http://ec.europa.eu/clima/policies/ets/cap/auctioning/index_en.htm.

Figure 1 shows the German climate targets against this background. The right bar shows the German greenhouse gas emission target for 2020. The lower part of the bar shows the emissions for the non EU ETS sectors according to the burden sharing agreement. The upper part is what remains for the EU ETS sectors. Compared to the situation in 2013 especially these emissions need to be reduced if one projects (third bar) that emission in the EU ETS fall by the average rate at which the overall EU cap is reduced.

Figure 1:
German emission targets



1990: European Environment Agency (EEA) (1990): total Emissions 1990 excluding LULUCF;

2013: non-ETS – proxy GHG estimates from EEA (2014), ETS – verified emissions from EEA (2015);

projection 2020: EU target non-ETS – European Commission (2013a), extrapolated ETS – assumption that verified emissions relative to 2013 fall with the same rate as the overall EU cap which is calculated from BMUB 2014b, p.12.

Sources: European Environment Agency (EEA) (1990, 2014, 2015), European Commission (2013a), BMUB (2014b: 12).

What becomes clear is that national emission targets, such as the German one, do not make sense in the European context. There should be targets for the non-EU ETS sectors while the remaining emissions are regulated on a European level. Consequentially, if EU ETS targets are perceived as not ambitious enough, the first and most important measure of national governments is to engage for stricter targets. If the German government has done this sufficiently in the past can be doubted since it opposed for example for a long time the attempts by the EU Commission and the European Parliament to withhold allowances – a measure which became known as backloading – as an emergency measure to revive the EU ETS in 2013. Additional national climate policy measures also affecting the national EU ETS

sector directly (such as the British minimum price) or indirectly (such as the German EEG) are thus only second-choice. They can only be justified if

- the EU ETS is not working effectively and efficiently,
- attempts for a reform fail,
- the aim is to initiate more national structural and technological change than the EU ETS that is always a compromise of all European member states.

The first question in this context is thus if the EU ETS has deficiencies. If this is the case then one needs to assess how additional national measures can and should be designed in the context of the European climate policy.

3. Deficiencies of the EU ETS

As mentioned in the introduction, allowances prices in the EU ETS have been very low since 2011 (Figure 2 shows the ICE Europe future carbon prices for the EU ETS since its implementation). While the reason for the sharp drop end of 2007 was over-allocation combined with the impossibility to transfer allowances from the first phase (see e.g. Ellerman et al. 2014) the reasons for the low prices after 2011 are in particular the world economic and financial crisis, but also falling prices for international Clean Development mechanism (CDM) credits that are partly compatible with EU allowances as well as a strong increase in renewable power production.

Figure 2:
EU ETS Future Prices

Source: Thomson Reuters Datastream. [Online]. (Accessed: July 2015). ICE-ECX EUA CONTINUOUS - SETT. PRICE - E /TE, LEXCS0.

While – given the low carbon prices – some NGOs see a complete failure of this scheme, economists mostly agree that the EU ETS per-se is broadly functioning as intended in the sense that the emission targets are met and that the increasingly mature carbon market can be expected to ensure cost efficiency. The latter means that the targets are reached at minimum costs as emissions trading ensures the equalization of marginal abatement costs across emitters (efficiency condition). Thus, the EU ETS is regarded as an efficient instrument to reach the European EU ETS targets.

Due to unforeseen events (above all the world economic and financial crisis), the targets turned out to be not very ambitious which is reflected in the low carbon price. This would not be a problem if the targets were chosen optimally and principally derived from the objective to reach long-term reductions targets at minimal costs. In fact the targets were always political targets influenced strongly by political feasibility and the formerly expected higher carbon prices. They are not in line with the EU Roadmap 2050 that stipulates to reduce EU greenhouse gas emissions by 80 percent relative to 1990 until 2050 to be in line with the internationally acknowledged target to limit average global warming to 2 degree Celsius compared to pre-industrial times. Compared to 2012 the Road Map still means a reduction of around 75 percent. Thus, the current low carbon prices do not give enough incentives for the significant structural and technological change needed to reach these more ambitious medium and long-term climate targets.

Reaching the current cap is thus not the only task of the EU ETS. It is also expected to promote technological and structural change that makes long and medium term emission targets (also politically) feasible and affordable. Against this background low carbon prices become a problem and besides other reforms such as an extension of the EU ETS to other sectors and regions (see introduction), experts call in particular for minimum and maximum carbon prices (see for example Edenhofer et al. 2014, Grubb 2015). Such a price corridor would not only address the problem of low carbon prices but would generally offer a mechanism for dealing with unforeseen developments. Maximum prices can avoid disproportionately high negative competitiveness effect for European EU ETS firms that compete with non-regulated firms outside the EU. Minimum prices can ensure sufficient incentives for structural and technological change. Both ceiling and floor should grow over time and price corridors would mark the transition to a hybrid-system that combines the advantages of both price- and quantity based instruments (see also Goulder and Schein 2013). The introduction of a market stability reserve as the EU is now about to agree on, is a step into the right direction, but does not reach far enough (see e.g. Edenhofer et al. 2014, Koch et al. 2014). One way to implement a price corridor is through minimum prices at allowance auctions and a maximum price at which an arbitrary amount of allowances is auctioned.

Unfortunately, given that some countries strongly rely on coal power (such as Poland) and thus oppose to a substantial EU ETS reform, this seems currently politically infeasible. The question of additional national measures also for the EU ETS sector thus becomes relevant.

4. Effective and efficient national climate policies for the EU ETS sectors

As indicated before, effective additional national emission reductions in the EU ETS sectors are not easily possible. This is for example one of the main criticisms the German renewable energy law (Erneuerbaren Energiengesetz – EEG) is facing. Subsidizing renewable electricity production by German tax payers increases the share of renewable energy in Germany and reduces German emissions in the electricity sector. But since this sector is covered by the EU ETS the reduced emission are emitted somewhere else in the EU as long as the cap remains the same (see for example Frondel et al. 2010 for this critique). In principle, the same holds true for all national climate polices that influence national EU ETS emissions while the EU wide EU ETS cap remains the same. The British CO_2-minimum price of 30 €/t CO_2 reduces British emissions but does not affect the cap. It can thus foster technological change in Great Britain but in the end without effectively reducing any emissions.

Concerning efficiency, the danger is always that such policies increase the already existing inefficiencies of European climate policy by creating additional wedges between marginal abatement costs. Subsidizing renewable electricity for example implies that the same emission targets are reached at higher costs than under the EU ETS alone. Differentiated subsidies among different kinds of renewable electricity as in the German EEG imply that even renewable electricity is produced at higher than necessary cost. Such policies are only valid from an economically point of view if they address additional external effects besides greenhouse gas emission, which are in particular technological spill-overs and technological learning (see e.g. Jaffe et al. 2005). The minimum price in Great Britain that only holds for electricity generators increases the inefficiencies within the entire EU ETS. Theoretically it can be possible that national efficiency is reduced (e.g. through an encompassing national minimum price) while the efficiency within the EU ETS sectors is reduced on an EU level. In such cases it needs to be analyzed in detail if overall efficiency in the EU increases or decreases which is not necessarily clear without a quantitative analysis.

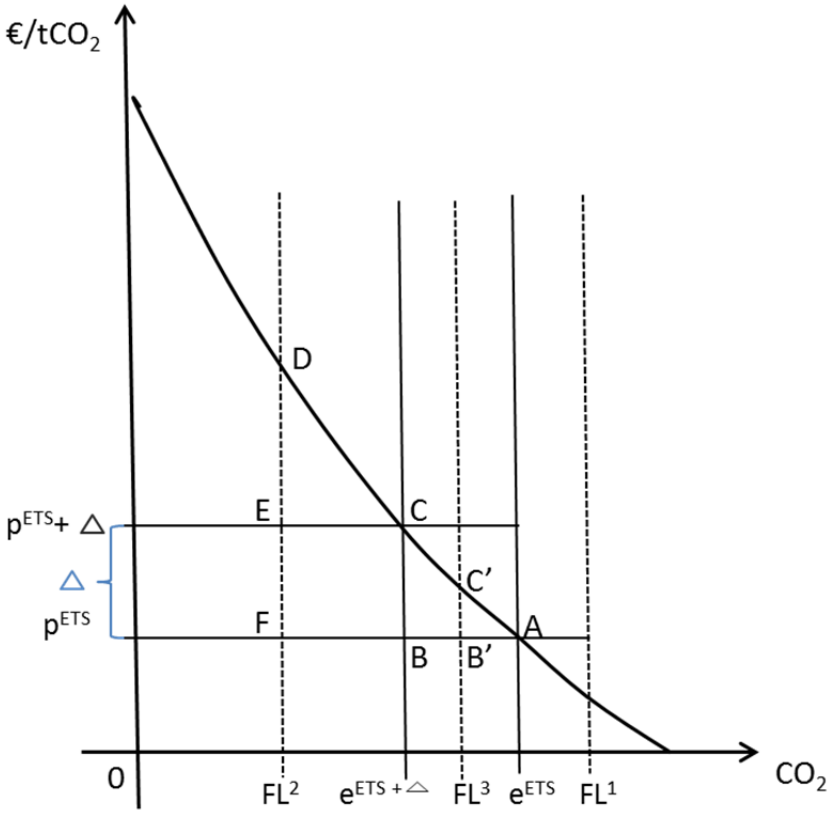
5. The proposed German climate levy

The German climate levy that is currently discussed is an interesting proposal because it is the first case for a national climate policy for the EU ETS sector that at least principally stipulates that emissions are reduced on the EU level through retiring allowances. This addresses one of the main concerns against e.g. the EEG. It is thus worthwhile to discuss its implications and how its design could be optimized.

The climate level stipulates that electricity generators have to submit a certain amount of additional allowances for emissions beyond a certain free emission level. These allowances are then retired (BMWi 2015). To reach the emission target for the electricity sector it is estimated that these “penalty allowances” equal to extra costs of 18 – 20 €/t CO_2 in 2020.

How much allowances would actually be retired is not clear though and depends on the level of the free emission level compared to the hypothetical emission level of the German electricity sector without this police measure, the development of the allowance price and the (implicit) level of the climate levy. Only by chance, the European emission reductions are equal to the German emission reductions. They can be either higher or lower. A detailed analysis is always necessary to define the level of free allowances and penalties for additional emissions to reach the targeted national and European emission reductions. This is shown in the following Figure 3 that depicts a marginal abatement costs curve (MAC) for an individual power station.

Figure 3:
Marginal abatement costs of a power station



It is possible to differentiate between three cases.

1. If the free level of allowances FL is larger (e.g. FL^1) than the (unknown) emission level that a power station would emit at the given EU ETS market price (e^{ETS}) the climate levy has no effect.

2. If the free level of allowances is smaller (e.g. FL^2) than the emission level that the power station would emit in the case were the EU ETS allowance price is increased by the costs of the penalty per tCO_2 (in the figure this is Δ), than the power station will emit exactly this amount $e^{ETS+\Delta}$. This is because marginal abatement costs are lower than the additional

abatement costs. In the sum additional abatement costs equal the area $e^{ETS+\Delta}$ CA e^{ETS}. Taking into account that allowances worth $e^{ETS+\Delta}$ BA e^{ETS} can be saved additional costs are only the area ABC. In addition, the power station has to pay a penalty of $(e^{ETS+\Delta} - FL^2)*\Delta$. Compared to a situation with an EU ETS minimum price of $p^{ETS} + \Delta$ the power station saves costs $FL^2*\Delta$. National emissions are reduced by $e^{ETS} - e^{ETS+\Delta}$. If this amount is invested into allowances to be retired, EU emissions are reduced by $[(e^{ETS+\Delta} - FL^2)*\Delta] / p^{ETS}$. Whether this is more or less than national reductions thus depends on the level of free emission, the allowance price, the actual emissions of the power stations and the penalty.

3. If the free level of allowances is between these two values (e.g. FL^3), with the same arguments as above the power station will emit the free level. In this case it emits more than under a minimum price of $p^{ETS} + \Delta$. The additional costs are only the triangle AB'C'. The power station does not pay a penalty. National emissions decrease, but EU emissions within the EU ETS do not.

The effectiveness of the climate levy to reach German emission targets depends – as for with all price based instruments – on how well the models estimate abatement costs of the power stations. If targets are not reached it would be necessary to readjust the specifics of the climate levy.

The efficiency of the discussed levy is also influenced by the design of the free emission level. In case 3, the power station always emits exactly the level of free emissions. It is not guaranteed that marginal abatement costs equalize across German power stations which is the condition for efficiency. It would thus be possible to reach the same national emission at lower costs. Also the proposal stipulates unlimited free emissions in the first 20 years of operation with the aim to charge especially old and inefficient coal power plants with high emission intensity. The German ministry of economics calculates that the proposed free emission level is set such that there will be no additional costs for 90 percent of fossil power generation. This ignores that also these power plants might have low cost abatement possibilities that would be profitable with the climate levy. It is not warranted that the emission reductions within the power sector are taking place where they are cheapest.

All this could be avoided if the level of free emissions is independent of age. If the level is very generous so that many plants do not emit more, case 1 from above anyways holds. Besides, the design of the free emission level could be such that each plant first has to pay the additional penalty for all their emissions. Then a fixed amount is deducted that is independent of the actual emissions and derived from a free emission level. This would ensure that also in case 3 plants would emit only as much as in case 2. It would be even more efficient if the climate levy applies to all sectors and not only the power sector. Free emission levels can then be derived for different sectors based on benchmarks. Again, the regulator can use the remaining revenues to buy and retire allowances.

Overall it would be a better to implement true national minimum prices. E.g. all EU ETS participants need to pay a climate levy that is the difference between the current EU ETs allowance price and the set minimum price (as it is the case in the UK – if necessary with

refunds as discussed above. The (remaining) revenues can then be used to retire allowances. The regulator can even decide how much allowances to retire by using e.g. only part of the revenues or by providing additional funds.

6. Summary and conclusions

In the economic optimum, there would be only one carbon price all over the EU and an overall coherent European climate policy. Under the current situation, with the EU level emission trading scheme (EU ETS) covering only around half of European greenhouse gas emission, national climate policies should in principle only be targeted to non ETS-sectors. Also more ambitious national targets than those set be the EU are easily possible and lead if reached also to EU emission reductions. To be efficient the implicit carbon price of the policy measures should equal the EU ETS allowance price. In addition, the aim should be to extend the EU ETS to cover more emissions.

Reality is much more complex though especially since the EU ETS itself needs reform. While it is reaching the defined cap, the cap is not very ambitious and the resulting low carbon prices of around 5 €/tCO_2 do not sufficiently incentivize the technological and structural changes needed to reach more ambitious medium and long term reductions targets. A reform of the EU ETS is thus needed that introduces a minimum price. Unfortunately, this seems currently not to be politically feasible.

If some EU member states want to go ahead, it is justified to undertake additional national measures also in EU ETS sectors. They should be compatible with the EU ETS, also lead to EU wide emission reductions while minimizing additional inefficiencies.

The proposed climate levy for the German power sector goes into the right direction especially since it stipulates that EU allowances are retired. The efficiency (and also the simplicity) can still be improved through a different design of the free emission level and the extension to all German EU ETS sectors. These would then need to pay a climate levy for all their emissions and get refunds derived from emission benchmarks and independently of their actual emissions. Overall, it is very unfortunate that the idea of the climate levy is not pursued. The alternatives that are now discussed in Germany because of the strong coal lobby, go completely in the wrong direction. They basically imply subsidies for additional emission reductions, which would be very costly for German tax payers, increase the inefficiencies in Germany and the EU without actually reducing any emissions. Reaching a national emission target that is problematic given the EU ETS in the first place in a way that counteracts the efficiency gains of the EU ETS is useless and costly window dressing.

While it is certainly necessary to push for a reform of the EU ETS wherever possible, we also need more discussion and analysis on how national climate policies can and should be designed to effectively and efficiently do more on a national level. In the best case this can also give more momentum to EU climate policy. In this context, the German climate levy is an interesting proposal that should be refined and added to the national tool boxes.

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