

# A new climate policy instrument for the electricity sector

## „Climate levy versus IGBCE/NRW-Proposal“

### Summary and Conclusions

In all likelihood, the German government will introduce a new climate policy instrument on 1 July 2015. It will not be the “climate levy” developed especially by the German Federal Ministry for Economic Affairs and Energy (BMWi) but rather the proposal made by the IG BCE trade union and the state of North Rhine-Westphalia. In the view of WWF Germany, the introduction of this instrument instead of the climate levy would have serious consequences for climate protection in Germany for consumers and will distort the market.

#### Emission reductions:

- The target adopted by Germany to reduce emissions by 40 percent by 2020 compared to 1990 levels will not be met if no further action is taken.
- The electricity sector will not make the agreed contribution to emission reduction of an additional 22 million tonnes (t) CO<sub>2</sub>. In all probability, the maximum contribution of Germany’s electricity sector to closing the gap to the 2020 target will only amount to 13-15 million t CO<sub>2</sub>. The electricity sector’s contribution determined in the climate program in December 2014 to closing the gap was already disproportionately low at 28-35% compared to the electricity sector’s share in Germany’s total emissions (38%).
- In all likelihood, the emission reductions that are not achieved by plant decommissioning and the expansion of combined heat and power – which is very expensive and involves substantial uncertainties – are double counting. These efforts have already been taken into account in other sectors in Germany’s climate program.

#### Costs:

- The emission reduction of 22 million t CO<sub>2</sub> will be significantly more expensive in the new IGBCE/NRW proposal than with the climate levy. Electricity consumers and taxpayers will have to foot the bill for price increases on the wholesale market amounting to between € 2.8 and 4.3 billion (instead of € 1 billion) if the overall target of an additional emission reduction of 22 million t CO<sub>2</sub> is to be achieved robustly.
- The scheme now proposed by the IG BCE trade union and the state of North Rhine Westphalia would lead to approx. half the emission reduction effects of the climate levy at approx. 30% higher costs in absolute terms.
- The polluters - the lignite companies - are not asked to pay; the taxpayers and the electricity consumers alone have to pay for the emission reduction.

### **Market distortion:**

- Three companies – RWE, Mibrag and Vattenfall – will in all likelihood receive billions of Euros to decommission power plants; other energy suppliers will not receive those payments. Competition will thereby be hugely distorted.

**BUT:** In addition to the already announced decommissioning of lignite power plants, there are additional lignite power plants that are to be taken out of operation. As a result 9 to 11 million t CO<sub>2</sub> will be additionally saved, depending on the calculation.

The phase-out of coal-based electricity generation in Germany is irrevocably on the political agenda. Vattenfall Europe has drawn some initial consequences from this discussion:

- The plans for new lignite mines in Germany were put on ice;
- Preparations to expand and relocate the Nochten II (Brandenburg) mine have been stopped;
- Preparations to relocate the Welzow Süd II (Brandenburg) mine are being re-examined.

## **Starting points**

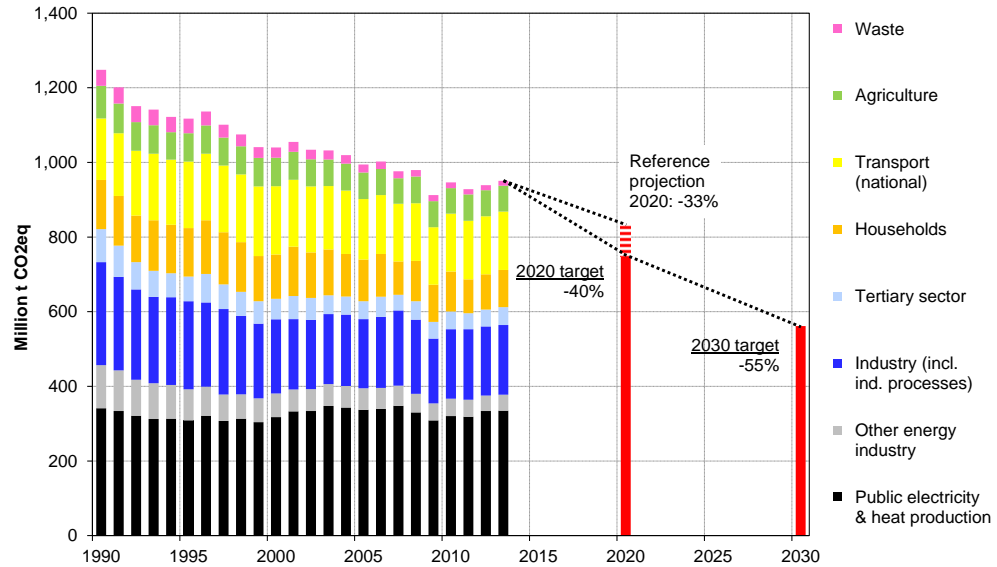
On 3<sup>rd</sup> December 2014 the German government reinforced the German climate target by adopting its Climate Action Programme. According to this, greenhouse gas (GHG) emissions must be reduced by 40% by 2020 compared to 1990 levels; Germany's emissions are not allowed to exceed a total of 750 million t CO<sub>2</sub> equivalent (CO<sub>2</sub>eq).

In the German government's most recent emission calculations, a reduction of GHG emissions by 27% had been achieved by 2014 compared to 1990 levels (from 1,248 million t CO<sub>2</sub>eq to approx. 912 million t CO<sub>2</sub>eq)<sup>1</sup>. To achieve the 40% target by 2020, Germany has to achieve a further emission reduction of 162.5 million t CO<sub>2</sub>eq or approx. 13 percentage points.

In its most recent projection report the German government assumes that an emission reduction of 33% by 2020 compared to 1990 levels will be achieved with the energy and climate policy measures that have already been introduced (see reference projection in Figure 1). Based on these calculations, therefore, it is necessary that an additional 90 million t of CO<sub>2</sub>eq be reduced on top of the reference development in order to meet the 40% reduction target. This corresponds to an additional emission reduction of about 7 percentage points.

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<sup>1</sup> It has recently come to light that in the determination of the German energy balances, on which the emission calculations are based, two newly commissioned hard coal-fired power plants had not be taken into account. The GHG emissions for 2014 thus increase by up to 8 million t CO<sub>2</sub> and the emission reductions needed to meet the 40% target also increase accordingly.



**Figure 1: Historic and future GHG emissions and emission reduction targets in Germany (Source: UBA, AG Energiebilanzen, Öko-Institut)**

The overview of Germany's Climate Action Programme shows that, on the one hand, the pursued measures will not fully close the remaining gap to meeting the target anyway. On the other hand, it is clear that the electricity sector's share to closing this gap as determined in December 2014 is disproportionately very low at 28-35% even if the reduction amounted to 22 million t CO<sub>2</sub>.

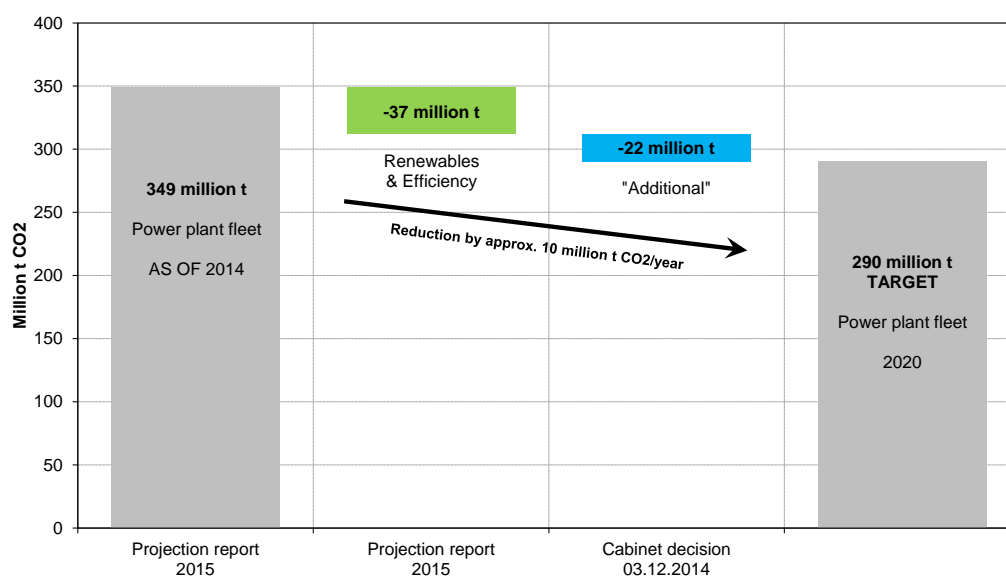
**Table 1: Distribution of additional emission reductions by sector according to Germany's Climate Action Programme 2014**

Key policy measures	Contribution to GHG emission reduction (million t CO <sub>2</sub> eq)
National Action Plan for Energy Efficiency (NAPE) (without measures in the transport sector)	Approx. 25 - 30 (including energy efficiency of buildings)
Strategy "Climate-friendly Building and Housing" (contains NAPE measures specific to buildings)	In total approx. 5.7 - 10 (of which 1.5 - 4.7 in addition to NAPE)
Measures in the transport sector	approx. 7 - 10
Reduction of non energy-related emissions in the sectors	
Industry, tertiary sector and waste	3 - 7.7
Agriculture	3.6
Reform of the EU ETS	Depends on decisions at EU level
Further measures, particularly in the electricity sector	22
<b>Total</b>	<b>62 - 78</b>

## The role of the electricity sector

In 2014, Germany's electricity sector emitted 349 million t CO<sub>2</sub> and thereby causes approx. 38% of Germany's total emissions<sup>2</sup>. The instrument developed by BMWi specifies that the electricity sector should reduce its annual emissions from 349 million t CO<sub>2</sub> in 2014 to a maximum of 290 million t CO<sub>2</sub> by 2020. To fulfill the climate protection target of 40% compared to 1990 levels, the share of electricity production in Germany's total emissions would increase by about one percentage point; this underlines once more the disproportionately low contribution of the electricity sector towards meeting the climate target.

In the plans of Germany's Climate Action Programme, it is assumed that a reduction amounting to approx. 37 million t CO<sub>2</sub> will be achieved based on the energy and climate policy measures that have already been introduced (expansion of renewable energies and increased energy efficiency). The remaining contribution of at least 22 million t CO<sub>2</sub> is to be additionally brought about in the electricity sector by the new climate protection instrument (see Figure 2).



**Figure 2: Gap to meeting the target in Germany's power plant fleet (annual emissions and contributions to emission reductions in million t CO<sub>2</sub>) (Source: BMWi)**

It is imperative to bring about the emission reduction by means of a new national climate protection instrument since the emissions of the power plant sector and of energy-intensive industry – which amount to approx. 52% (in 2011) of Germany's GHG emissions – are subject to the Emissions Trading System of the European Union (EU ETS). The EU ETS has, however, not been functioning properly for years. In order to develop a proper steering effect, the allowance price in emissions trading would have to be at least 35 € / t CO<sub>2</sub> instead of approx. 7 to 8 € / t CO<sub>2</sub> today. To remove the causes of this lack of a steering effect, a profound structural reform of the EU ETS is needed.

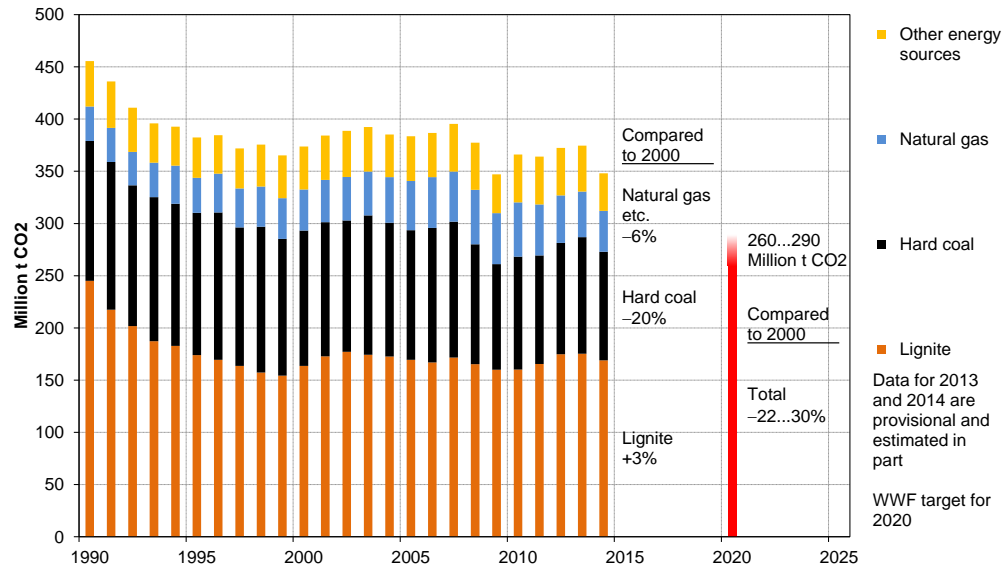
WWF Germany has made reform proposals for this purpose. Although rules on the structural reform of the EU ETS have been decided upon at EU level with the increase of the linear reduction factor for the EU ETS cap and the establishment of a market stability reserve (MSR), these changes will only be able to make a significant impact after

<sup>2</sup> Taking into account the power plants that were not considered (see Footnote 1), the contribution to emission reduction increases accordingly.

2020 and cannot contribute to the emission reductions needed by 2020. More far-reaching reforms of the EU ETS, which could result in a contribution to closing the gap to meeting the 2020 target, are not currently foreseen. Largely because of this, we note – not only in the case of Germany – that particularly harmful (coal) power plants are currently very profitable. The introduction of a national climate protection instrument which, in parallel to the EU ETS, helps to reduce Germany’s GHG emissions by at least 22 million t CO<sub>2</sub> in addition to the reference development is therefore essential to achieve the 40% target by 2020.

## Ambitious reduction of coal-fired electricity production is needed

Electricity production based on hard coal and lignite is responsible for approx. one third of Germany’s total GHG emissions. It is only possible to achieve the 2020 climate target if there is an ambitious reduction of coal-fired electricity production in Germany. So far, the contributions of fossil fuels to emission reduction in the power plant sector have been very varied since 2000. Natural gas and hard coal made substantial contributions – of 6% and 20% respectively compared to 2000 – to emission reductions in the power plant sector. It should be noted that the share of low-emission natural gas electricity production in the electricity mix increased slightly from 8.5% in 2000 to 9.5% in 2014, despite the very difficult market situation for natural gas power plants since 2011. The emission reductions of coal-fired electricity production mainly result from a significant decline in electricity production from 24.7% in 2000 to 17.8% in 2014 (“hard coal crunch”) and a slight decline in electricity demand. In contrast, the GHG emissions of lignite electricity production have not fallen compared to 2000; in fact, they have increased by 3% (see Figure 3). The share of lignite in Germany’s electricity production remained high at 25.4% in 2014 and virtually unchanged compared to 2000 (25.7%). Lignite power plants are very emission-intensive. The specific emissions of lignite power plants are on average about 20% higher than those of hard coal-fired power plants. Lignite electricity production is responsible for approx. half (49%) of the emissions of the German power plant sector. This is due, among other things, to the fleet of German lignite power plants, which contains a particularly high proportion of very old power plants with a very low efficiency. Given that it has the oldest and most emission-intensive power plants, lignite should therefore – in accordance with the polluter pays principle – take on greater responsibility in climate protection terms and contribute the largest share of emission reductions.

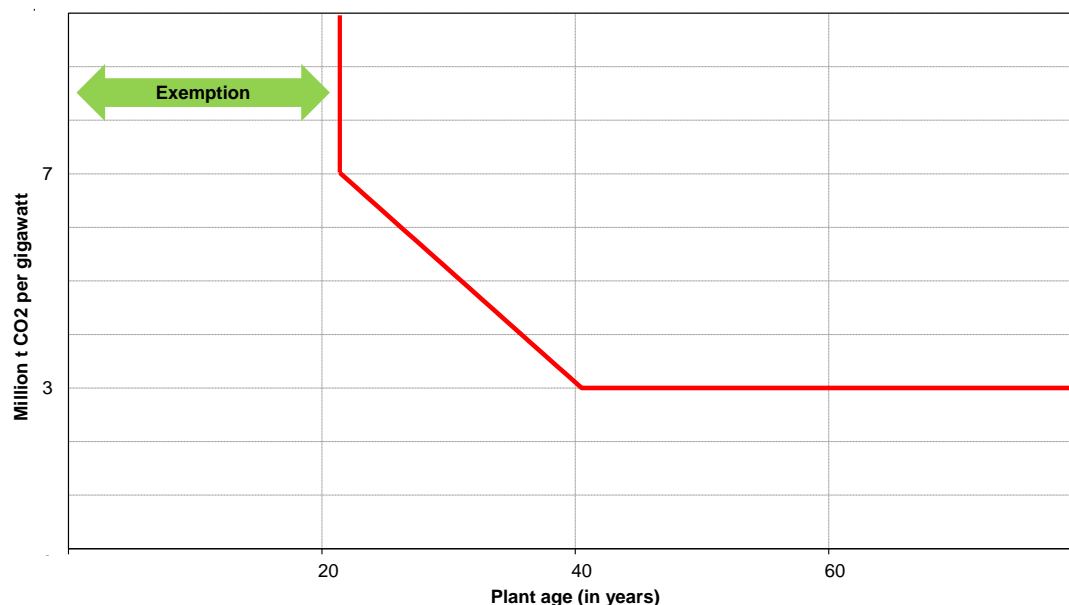


**Figure 3: Previous contribution of fossil fuels to emission reductions**  
 (Source: Öko-Institut)

## Climate levy: How it functions and the effects

### How it functions

The German Federal Ministry for Economic Affairs and Energy (BMWi) developed a new climate protection instrument in which especially old and emission-intensive power plants bring about an emission reduction (“climate levy”) as soon as they exceed a specified emission threshold. It is envisaged that power plants are not subject to additional emission regulation until they reach 20 years of age. From the age of 21 years each power plant is exempt from paying allowances up to a specified threshold, which begins at 7 million t CO<sub>2</sub> per installed GW capacity and decreases linearly up to 40 years of age to 3 million t CO<sub>2</sub> per GW and year; from a plant age of 41 and above, the threshold remains at this level. For each tonne of emitted CO<sub>2</sub> which exceeds this allowance threshold, the power plant operator will be required to pay for the additional allowances from 2017 onwards. These payments should increase to € 18-20 by 2020 (“phase-in”). The plant operators shall be obliged to pay for these additional emissions in the form of EU ETS emission allowances, which are then retired. Currently, with the allowance price at 7-8 € / tCO<sub>2</sub>, up to three emission allowances would need to be purchased (and then retired) for every tonne of emitted CO<sub>2</sub> above the threshold. The power plant operators therefore have the option of exceeding the exemption threshold and paying for the additional emissions. In hours of high electricity prices, this can be attractive for plant operators; at other times, the production would be reduced to the threshold level. Overall this would result in a situation whereby approx. 90% of Germany’s CO<sub>2</sub> emissions from electricity production would not be subject to the additional payments. The total CO<sub>2</sub> emissions for the power plant sector – i.e. including the emissions below the threshold – would be subject to regulation via the EU ETS.



**Figure 4: Threshold for exemption from making additional payments (Source: BMWi)**

### Emission reduction

The instrument has a climate-friendly leverage effect by effectively limiting the emissions of particularly old and inefficient coal-fired power plants. At the same time, it also complements the existing regulatory framework of the EU ETS. The emission reduction of the instrument is brought about by two mechanisms. Firstly, the production of very old and emission-intensive power plants is replaced by less emission-intensive power plants. Secondly, the previously unbroken trend of a huge expansion of net electricity exports that are provided overwhelmingly by CO<sub>2</sub>-intensive coal-fired power plants would be broken or vice versa. Without further measures, the electricity exports of approx. 35 TWh in 2014 (the hitherto historically highest level) would increase to approx. 51 TWh in 2020; with the planned introduction of the climate protection instrument, net electricity exports would likely be limited to about 36 TWh in 2020, thereby remaining more or less at current levels.

Furthermore, the reform of the EU ETS would be supported by the retirement of emission allowances under the German instrument, and the effectiveness of the EU ETS would be advanced sooner.

### Costs

With the introduction of the additional payments and the reduced electricity production of particularly old and emission-intensive power plants, the supply structure in the north-west European regional market would change and wholesale electricity prices would slightly increase by up to 0.2 cents per kilowatt hour (according to BMWi). The electricity consumers would thereby have to come up with approx. € 1 billion for the emission reduction. In addition, the lignite companies would lose revenues from their lignite electricity production.

## Proposal of the IG BCE trade union and NRW

### Elements and how it functions

On the basis of a proposal made by Germany's Mining, Chemical and Energy Industries Union (IG BCE) and the state North Rhine-Westfalia, the previously planned instrument developed by BMWi is to be replaced. This counter model consists of three elements.

Firstly, a power plant reserve is to be formed, into which several old lignite power plants are to be transferred and thereby cease production. A lignite power plant reserve of approx. 2,700 MW is planned, which would also include power plants with a capacity of at least 600 to 750 MW for which decommissioning was planned anyway<sup>3</sup>. In net terms, therefore, lignite power plant capacities of 1,900 to 2,100 MW are decommissioned with this model, corresponding to about a 10% share of the installed net capacity of German lignite power plants. The power plant operators would receive compensation payments over a period of four years for the decommissioning; the amount of these compensation payments is still being negotiated with the German government.

Secondly, the promotion of combined heat and power (CHP) would be expanded in Germany. With this increased support, the existing stock of natural gas-fired CHP plants would be secured so that these plants can cover the costs of staff and maintenance and not be decommissioned. At the same time, the electricity production of new CHP plants, which replace old coal-fired CHP plants, would increase by about 10 TWh by 2020, i.e. by approx. 10% of the current electricity production from CHP plants. To achieve both of these goals, the current limit on the promotion of CHP in Germany should be increased from € 750 million to € 1.5 billion a year, as has already been agreed. It is more important, however, that the concrete support schemes enable the intended effect. Based on the previous proposals, this is not the case; above all the construction of new natural gas CHP plants will not be possible with the funding rates proposed so far.

Thirdly, additional emission reductions are to be achieved by means of a number of measures that go beyond electricity production. Exact measures intended here are not yet known; based on the available information, however, substantial double counting with regard to the National Action Plan for Energy Efficiency can be expected.

### Emission reduction

Based on the information available at present, the emission reduction effects of the proposed alternative measures can be assessed as follows.

The transfer of lignite power plant capacity amounting to 2,700 MW (of which 600 to 750 MW has already been set aside for decommissioning) to a reserve, i.e. the decommissioning of these capacities, will lead to emission reductions of 9-11 million t CO<sub>2</sub> in Germany.

The increased promotion of CHP in Germany can bring about emission reductions of up to 4 million t CO<sub>2</sub> if the specific support conditions are such that the targets for electricity production from natural gas-fired CHP plants will actually be achieved. This is unlike-

<sup>3</sup> Rheinische Post, 29.06.2015, p. B11. The RWE power plants Frimmersdorf (blocks P and Q: 560 MW in total), Niederaußem (Block C, 300 MW), Weisweiler (Block C, 300 MW), Goldenberg (150 MW), the Mibrag plant Buschhaus (350 MW) and two blocks of Vattenfall Europe's Jänschwalde power plant (blocks A and B: 1,000 MW in total) are mentioned in this regard. Since the P and Q blocks of the Frimmersdorf power plant and Goldenberg were already set aside for decommissioning, the net additional power plant capacity to be decommissioned amounts to approx. 1,900 MW. If the Goldenberg power plant capacity, the decommissioning of which was planned for 2015, is not transferred to the reserve, it is necessary – with a reserve of 2,700 MW – to decommission additional power plant capacity of approx. 300 MW, which has not already featured in the planned decommissioning.



ly based on the proposals submitted so far. The additional contribution to emission reductions amounting to 4 million t CO<sub>2</sub> therefore depends very strongly on a significant improvement of the previous proposals for the promotion of natural gas-fired CHP in Germany.

It is not possible at present to estimate reliably the effect of the remaining measures since the corresponding rules have not yet been specified in detail. However, an additional contribution to emission reductions of about 7 to 9 million t CO<sub>2</sub> (i.e. the remaining difference to the target of 22 million t CO<sub>2</sub>) in sectors other than electricity production and in addition to the already very ambitious goals of the NAPE (see above) will require more far-reaching measures.

### **Costs**

The reserve for lignite power plants causes costs for electricity consumers on two levels. On the one hand, price-increasing effects will also arise in the wholesale market for electricity. With a reduction level of lignite electricity production that is approx. half that of the climate levy, the electricity price effect will also be around half. For the lignite reserve, electricity consumers will thus have to pay approx. € 500 million a year more for electricity. Furthermore, the compensation payments to the plant operators are currently estimated at approx. € 800 million per year. For half the emission reduction effects of the climate levy, therefore, about 30% higher costs arise in absolute terms.

The costs of an increased promotion of CHP amount – in addition to the increase in the funding volume from € 750 million to € 1 billion that is already planned – will be at least an additional € 500 million a year. Under current regulations, the costs are mainly borne by small consumers, since energy-intensive industry is almost completely exempt from the payment of the CHP surcharge. The CHP surcharge of currently approx. 0.25 € cents per kilowatt hour would thereby roughly treble. Whether the above-mentioned targets can be achieved with the promotion that is thereby afforded, remains questionable. During the legislative process, the additional costs for the promotion of CHP may increase by another € 500 million to € 1 billion, i.e. the total support volume for CHP would then amount to € 2 billion a year.

For the additional measures, substantial budgetary resources will most notably be needed. Taking into account the support funds applied in relevant sectors (buildings, transport), a minimum of € 1 to 2 billion a year should be assumed if measures are to be pursued based on which the remaining gap of 7 to 9 million t CO<sub>2</sub> can be sufficiently securely closed.

For electricity consumers and tax payers, therefore, annual costs of € 2.8 to 4.3 billion arise with the alternative proposal – equivalent to about three to four times the costs that would arise with the instrument developed by BMWi for achieving the same emission reductions.

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