

Funding for CHP in Germany's Coal Phase-out Law

Compatibility with EU State Aid Law and Climate Targets

1 Introduction

The recently adopted Coal Phase-out Law (Kohleausstiegsgesetz¹) in Germany contains comprehensive amendments of the Cogeneration Act (KWKG) in addition to the Act on the Reduction and Phase-out of Coal-based Electricity Generation (Kohleverstromungsbeendigungsgesetz - KVBG). To promote the expansion of combined heat and power (CHP) plants, the new provisions focus on two bonuses: the Coal Replacement Bonus (1.1.) and the so-called "South Bonus" (1.2.) for new CHP plants in the southern region² of Germany. These bonuses are paid to CHP plant operators additionally to the market premium they receive according to the KWKG (which remains unchanged in its basic structure and is simply prolonged until December 2029 with the current reform).

This briefing aims to highlight the legal changes and critically assess their compatibility with the EU State Aid Law and climate targets.

1.1 The Coal Replacement Bonus

The previous KWKG contained a provision on the Coal Replacement Bonus, so the scheme itself is not completely new. The underlying idea is to incentivize a (CHP) coal plant to convert to a CHP plant based

¹ Gesetz zur Reduzierung und zur Beendigung der Kohleverstromung und zur Änderung weiterer Gesetze (Kohleausstiegsgesetz – „KAG“), as presented in *BT Drucksache 19/20714 (neu)*, in the *Beschlussempfehlung* and the *Bericht des Ausschusses für Wirtschaft und Energie (9. Ausschuss) u.a. über den Regierungsentwurf zum Kohleausstiegsgesetz*

² The Southern region is limited to certain provinces located in the States of Bavaria, Baden-Württemberg, Hessen, Rhineland-Palatinate and Saarland.

on a different energy source. The new provision³ restructures, re-designs and increases the bonus amount, in some cases significantly. Rather than being based on the number of kilowatt per hour (KWh) as under the previous KWKG, the Coal Replacement Bonus amount is now determined according to the capacity in kilowatt (KW) and the age of the plant.⁴ Operators of an existing coal-fired CHP plant receive a one-time payment if they switch to waste, waste heat, biomass, gaseous or liquid fuels.

As to the eligible fuels, the Coal Commission agreed as part of the coal phase-out deal that the creation of additional gas capacities, in particular, was “a necessity” to ensure the security of supply in light of the coal phase-out.⁵

According to an earlier draft of the revised provision for the Coal Replacement Bonus, all converted hard coal plants were to receive a bonus of EUR 180 per KW.⁶ Shortly before the law was passed, the provision was substantially amended and now contains a much more complex mechanism. Depending on the date of operation of the existing plant and the new plant, a payment of EUR 390-5 per KW can be granted. According to the explanatory memorandum to the law, the new provisions intend to reflect the different economic situations of the plants and to provide an incentive to accelerate their phase-out.⁷ Apparently the funding sums are determined according to the lost profits, though no further details or calculations are provided.⁸

Amount of Coal Replacement Bonus (EUR per KW)								
Start year of operation (hard coal CHP plant)	Start year of operation (New CHP plant)							
	2022	2023	2024	2025	2026	2027	2028	2029
1975-1984	50	50	35	20	5	0	0	0
1985-1994	225	225	210	195	180	165	150	135
As of 1995	390	390	365	340	315	290	265	240

The new CHP plant does not have to be constructed on the same site as the old plant (Section 7c (1) (3) KWKG). It must however feed into the same heating grid. The old plant must be phased out within 12 months before the operation or at the latest once the operation of the new CHP plant has started.

Curiously, the Coal Replacement Bonus is applicable for hard coal plants that have converted to a CHP plant based on a different energy source after 1 January 2016 (Section 7c (1) and (2) KWKG). If it is not a clerical mistake in the law, this makes the scheme retroactive and raises serious doubts as to its incentive effect.

³ Section 7c KWKG

⁴ Cabinet Bill_1909085 Draft law on the reduction and termination of coal-fired power generation and on the amendment of other laws, 29.01.2020 (coal phase-out law) - Kabinettvorlage_1909085 Entwurf eines Gesetzes zur Reduzierung und zur Beendigung der Kohleverstromung und zur Änderung weiterer Gesetze , 29.01.2020 (Kohleausstiegsgesetz) p. 190

⁵ Coal Commission Report (available at https://www.bmwi.de/Redaktion/EN/Publikationen/commission-on-growth-structural-change-and-employment.pdf?__blob=publicationFile&v=3), p.12

⁶ Cabinet Bill_1909085 Draft law on the reduction and termination of coal-fired power generation and on the amendment of other laws, 29.01.2020 (coal phase-out law) - Kabinettvorlage_1909085 Entwurf eines Gesetzes zur Reduzierung und zur Beendigung der Kohleverstromung und zur Änderung weiterer Gesetze) , 29.01.2020 (Kohleausstiegsgesetz) p73

⁷ Resolution recommendation and report of the Committee on Economic and Energy Affairs (9th Committee), Drucksache 19/20714. 02.07.2020, p.205

⁸ Resolution recommendation and report of the Committee on Economic and Energy Affairs (9th Committee), Drucksache 19/20714. 02.07.2020, p.206

1.2 The South Bonus

The South Bonus grants operators a one-time payment of EUR 60 per kilowatt for new, modernized or refurbished CHP plants built in the southern region of Germany between 31 December 2019 (Section 7d (1) No. 1 KWKG) and 31 December 2026. As for the Coal Replacement Bonus, the eligibility of CHP plants built between 31 December 2019 and the date of adoption of the KVBG raises doubts as to the retroactivity of the scheme and its incentive effect. The provision intends to incentivize operators to set up CHP plants in the south of Germany because the grid development plan 2019 to 2030 has repeatedly flagged the congestion of the German north/south transmission line due to high power generation in the north and high demand in the south.⁹ New electricity generation capacities in the south could help ensure stable grid operation and a secure supply.¹⁰

Operators can receive the South Bonus in addition to the Coal Replacement Bonus.

2 Compatibility with EU State Aid Law and Climate Policy

The fact that the newly introduced bonuses result in an overcompensation of gas (2.1), potentially leading to a lock-in effect (2.2), and in a delay of the hard coal phase-out (2.3) call their compatibility with State aid law and with the climate targets into question.

2.1 Overcompensation of Gas

The increase in the Coal Replacement Bonus and the introduction of the South Bonus risk to result in an overcompensation of gas plants, in particular because the funding does not take into account the actual costs.

Lack of funding for renewable energy sources (RES) in relation to gas

The Coal Replacement Bonus is granted according to age and the South Bonus according to location of the plant. CHP plants based on gas can receive the funding regardless of their climate effects.

Though the law claims to contribute to reaching the target of carbon neutrality by 2050, it completely disregards the greenhouse gas emissions (GHG-emissions) of natural gas.¹¹ What is more, the replacement of coal with gas plants leads to an increase of GHG-emissions of 41 %¹² instead of a decrease as previously assumed¹³. Fossil gas contains methane as its main component, which is at least 25 times¹⁴

⁹ Federal Council: Recommendations of the Committees - Bundesrat: Empfehlungen der Ausschüsse. Drucks. 51/1/20. 2.03.2020, p.11

¹⁰ Cabinet Bill_1909085 Draft law on the reduction and termination of coal-fired power generation and on the amendment of other laws, 29.01.2020 (coal phase-out law) - Kabinettvorlage_1909085 Entwurf eines Gesetzes zur Reduzierung und zur Beendigung der Kohleverstromung und zur Änderung weiterer Gesetze , 29.01.2020 (Kohleausstiegsgesetz) p.191

¹¹ UBA: Energy-related emissions <https://www.umweltbundesamt.de/daten/energie/energiebedingte-emissionen#energiebedingte-treibhausgas-emissionen>

¹² Energy Watch Group – EWG Natural Gas Study September 2019 p.11

¹³ IEA. 2018. 'World Energy Outlook 2018'

¹⁴ UBA: The greenhouse gases - <https://www.umweltbundesamt.de/themen/klima-energie/klimaschutz-energiepolitik-in-deutschland/treibhausgas-emissionen/die-treibhausgase>

more potent than carbon dioxide in terms of global warming.¹⁵ Methane can be emitted during several different stages: during extraction, liquefaction and regasification, during transport itself and finally during the combustion of fossil gas.¹⁶

The funding incentivises the continued and expanded use of the fossil fuel, gas, which cannot be counteracted by the bonus for innovative renewable heat under Section 7a of the KWKG.¹⁷ In some cases the CHP funding exceeds the funding for renewable energy plants, particularly with a generation capacity up to 20 MW. The new bonuses thus provide a stronger economic incentive to set-up a gas CHP plant than a renewable energy plant in some cases.

Furthermore, the Coal Replacement Bonus is only granted to former coal operators, giving them an unjustified and market-distorting advantage. As a consequence, operators of renewable energy plants could be elbowed out of the market.

Funding does not take into account the actual costs

Instead of calculating the amount of support according to the actual costs of converting or installing a CHP plant and evaluating those separately per type of fuel, the law stipulates lump-sum subsidies. Because the Coal Replacement Bonus provision was changed and designed in a much more complex way right before being voted on by the Parliament, a detailed examination of whether the amount is appropriate was not publically conducted.

Moreover, the fact that both the Coal Replacement Bonus and the South Bonus may be granted to the same operator for the same CHP plant increases the risk of overcompensating hard coal operators (indeed, this possible double funding is only available for CHP operators that also used to be hard coal operators, but not for any other CHP operator).

Calculation of the funding amount in relation to the maximum aid intensity

The Commission will assess the compatibility of the aid under Art. 107 TFEU and under the guidelines on state aid for environmental protection and energy 2014-2020 (EEAG).

There are doubts as to the compatibility of the aid with the guidelines. In particular, Annex 1(1) EEAG states that the maximum aid intensity for cogeneration should not exceed 100 % if determined in a bidding procedure. A lower threshold would apply for the Coal Replacement and South Bonus because they are not awarded pursuant to this procedure.

Moreover, this aid limit is exceeded in some cases because the bonuses along with the market premium for cogeneration partly exceeds the overall investment costs. The conversion to a gas CHP or the installation of a new plant requires an investment of around EUR 1,000-1,500 per kilowatt.¹⁸ Assuming a basic premium of 3.1 cent per kilowatt hour for 30,000 operating hours and a Coal Replacement Bonus of

¹⁵ BGR (2020): Climate Effect of Natural Gas - Literature study on the climate relevance of methane emissions from natural gas production and liquefied gas and pipeline transport to Germany (Klimabilanz von Erdgas- Literaturstudie zur Klimarelevanz von Methanemissionen bei der Erdgasförderung sowie dem Flüssiggas- und Pipelinetransport nach Deutschland – 57) p.1; Hannover

¹⁶ BGR (2020): Climate Effect of Natural Gas - Literature study on the climate relevance of methane emissions from natural gas production and liquefied gas and pipeline transport to Germany (Klimabilanz von Erdgas- Literaturstudie zur Klimarelevanz von Methanemissionen bei der Erdgasförderung sowie dem Flüssiggas- und Pipelinetransport nach Deutschland – 57) p.35-36; Hannover

¹⁷ BEE: Statement on the draft bill of the Federal Ministry of Economics and Energy on the Act on the Reduction and Termination of Coal-fired Power Generation and on the Amendment of Other Acts (Coal Exit Act) of 22.01.2020 p.6

¹⁸ Matthes, Felix: Statement Coal Phase-Out Law (Stellungnahme Kohleausstiegsgesetz). 19.05.2020. p.17

EUR 5-390 per kilowatt, a South Bonus of EUR 60 per kilowatt plus the costs of the removal of the avoided grid usage fees (-2 euros per MW, EUR -60 per KW, EUR -100 per KW) and the regulations within the framework of the Fuel Emission Trading Act (BEHG) (EUR 12 per megawatt hour + EUR 360 per KW + EUR 100 per KW), the subsidy amount is EUR 1,235-1,880 per kilowatt.¹⁹ This is well above the maximum aid intensity of 100 %, particularly for all funding above 1.500 EUR.

Funding type	Funding sum
CHP basic premium	+€930 per KW (3,1 ct per kilowatt hour for 30.000 hours of operation)
Coal Replacement Bonus	+€5-390 per KW
South Bonus	+€60 per KW
Regulations within the framework of the Fuel Emission Trading Act (BEHG) CO ₂ -price 55 € per ton	+€12 per megawatt hour +€360 per KW (3.000 hours of operation over 10 years) +€600 per KW (5.000 hours of operation over 10 years)
Removal of the avoided grid usage fees	-€2 per megawatt hour -€60 per KW (3.000 hours of operation over 10 years) -€100 per KW (5.000 hours of operation over 10 years)
TOTAL:	€1.235-1.880 per KW²⁰

¹⁹ Matthes, Felix: Statement Coal Phase-Out Law (Stellungnahme Kohleausstiegsgesetz). 19.05.2020. p.17

²⁰ Matthes, Felix: Statement Coal Phase-Out Law (Stellungnahme Kohleausstiegsgesetz). 19.05.2020. p.17

2.2 Lock-in Effect

The overcompensation of gas could ensue a so-called lock-in effect. This occurs when the energy supply is so heavily dependent on gas that switching to other options would require a considerable effort and lead to high costs.

Following mineral oil, fossil gas is already the second most important primary source in the German energy mix.²¹ The gas network in Germany extends over 511,000 km and pipelines of 810 km are planned.²²

The German government is pursuing these plans despite the detrimental social and climate effects. Back in 2015, a study found that the number of planned gas plants would prevent the global community from staying below the 2°C threshold.²³

Eliminating all investment and operating subsidies for gas is the only reasonable response in the current climate crisis – and the most sensible use of state resources. For this reason, the Netherlands, the EU's largest gas producer, has agreed to phase out gas by 2030.²⁴

After the nuclear and coal phase-out, this would also be the next step for Germany. However, with the new bonuses, it will not be able to follow suit. Similar to the coal phase-out, considering the strong position of the gas industry and the financial incentives for its expansion, a gas phase-out would require vigorous political confrontation with the risk of the compromise resulting in an unambitious phase-out plan and excessive compensation payments at the expense of the taxpayer and the environment.

Because Germany already imports 92% of its gas, the increasing demand is of high geo-political relevance and may effect the security of supply.²⁵ After the Dutch gas phase-out, Germany will be increasingly dependent on imports from Norway and Russia.²⁶

Because the German legislator has not considered any alternatives to avoid the lock-in risk outlined above in favour of fossil gas, it is doubtful that the Coal Replacement and South Bonuses are appropriate to achieve the objective of decarbonising Germany's energy mix.

2.3 Delayed hardcoal phase-out

Hard coal plants may receive CHP funding, namely a possible cumulation of the CHP premium, the Coal Replacement Bonus and the South Bonus, if they chose not to participate in the auctions for closure

²¹ BMWi: Natural Gas Supply in Germany (Erdgasversorgung in Deutschland 2020)
<https://www.bmwi.de/Redaktion/DE/Artikel/Energie/gas-erdgasversorgung-in-deutschland.html>

²² BMWi: Natural Gas Supply in Germany (Erdgasversorgung in Deutschland 2020)
<https://www.bmwi.de/Redaktion/DE/Artikel/Energie/gas-erdgasversorgung-in-deutschland.html>

²³ Peter, Erikson. Stockholm Environmental Institute: Discussion Brief - Carbon lock-in from fossil fuel supply infrastructure. 2015 <https://mediamanager.sei.org/documents/Publications/Climate/SEI-DB-2015-Carbon-lock-in-supply-side.pdf>

²⁴ Roessler, Nele: Netherlands ends gas funding (Niederlande beenden Gasförderung), Deutschlandfunk, 28.06.2018 - https://www.deutschlandfunk.de/niederlande-beenden-gasfoerderung-keine-entschaedigung-fuer.697.de.html?dram:article_id=421492

²⁵ Federal Statistical Office: Data on energy price trends - Long series from January 2005 to May 2020 (Statistische Bundesamt: Daten zur Energiepreisentwicklung - Lange Reihen von Januar 2005 bis Mai 2020) - 26.06.2020 p.8

²⁶ Federal Statistical Office: Data on energy price trends - Long series from January 2005 to May 2020 (Statistische Bundesamt: Daten zur Energiepreisentwicklung - Lange Reihen von Januar 2005 bis Mai 2020) - 26.06.2020 p.

compensations and/or if they are phased-out by law (from 2031), in which case they are not eligible to closure compensations.

At present, the closure compensation amount for the first round of tendering is set at a maximum bid of EUR 165 per MW, which is significantly lower than the CHP funding.²⁷ Indeed, the subsidy for CHP plants is approx. EUR 1,235-1,880 per KW, whereby the conversion costs of approx. EUR 1,000-1,500 must be taken into account.

In fact, the use of CHP funding enables hard coal plants to prolong their operation and still receive a high level of funding. For example, plants that were commissioned after 1985 can receive a Coal Replacement Bonus of between EUR 100-240 per KW, i.e. a total subsidy of EUR 1,330-1,730 per KW, if they are phased-out after 2027.

It is therefore clearly advantageous for the hard coal plants, in particular the oldest ones, to apply for CHP funding rather than participating in the first rounds of auctions for closure. This poses the risk that the hard coal phase-out will be delayed, at least up until 2024. Modelling has shown that sufficient older power plants would be incentivized to participate in the first auction round to meet the auctioned GW-volumes.²⁸ For the subsequent rounds for 2021, 2022 and 2023, however, participation is expected to be low and therefore decommissioning is likely to be delayed until after 2024 because of the possibility to obtain the considerably more attractive CHP funding.²⁹

In addition, in cases of hardship, the 30-month period can be extended in accordance with Section 51 (2) No. 2 KVBG. A case of hardship according to Section 39 Para. 2 S.2 KVBG usually exists if a commenced conversion is not completed within the deadline without the plant operator being responsible.

3 Conclusion

In view of the Paris climate targets and the goal of climate neutrality by 2050 in the European Green Deal, renewable district and local heating is of particular significance. Unfortunately its importance is not reflected in the current German Coal Phase-out Law. For example, contrary to the recommendations of the CHP evaluation report, the target of increasing the share of renewable heat to 30% by 2030 has not been included.³⁰ The current bonuses, on the other hand, provide a misdirected incentive to expand gas plants and infrastructure. In light of the low gas prices and the fact that fossil gas is already one of the main energy sources when it comes to heating, even before hard coal, there is no economic reason to use public funds to support it. Since the KWKG provides for high subsidies beyond 2027 which are higher

²⁷ König, Hannes: Statement on the draft law on the reduction and termination of coal-fired power generation and on amendments to other laws (Stellungnahme zum Entwurf eines Gesetzes zur Reduzierung und zur Beendigung der Kohleverstromung und zur Änderung weiterer Gesetze), p. 5

²⁸ König, Hannes: Statement on the draft law on the reduction and termination of coal-fired power generation and on amendments to other laws (Stellungnahme zum Entwurf eines Gesetzes zur Reduzierung und zur Beendigung der Kohleverstromung und zur Änderung weiterer Gesetze), p. 5

²⁹ The risk of delay due to the more attractive CHP funding compared to the hard coal award is limited solely by the fact that for the target dates 2024 to 2026, phase-outs will be conducted by law according to age of the plants (the older having to decommission first) if not enough plants participate in the tenders. From 2027 onwards, the remaining hard coal plants will continue to be decommissioned by law according to the age list. This does not include plants up to 150 MW and those that are absolutely necessary for the safety and reliability of the grid. The list of plants deemed necessary will only be published on 1 July 2021 (see Section 29 (4), (5) (1) KVBG).

³⁰ Bericht: Evaluierung der Kraft-Wärme-Kopplung S.3 https://www.bmwi.de/Redaktion/DE/Publikationen/Studien/evaluierung-der-kraft-waerme-kopplung.pdf?__blob=publicationFile&v=6

than the compensation payments in the hard coal tenders, especially for young power plants, this regime also creates a risk of a delayed hard-coal phase-out.

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