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Subject: **State Aid SA.57779 (2020/N) – Germany**
EEG 2021

Excellency,

1. PROCEDURE

(1) On 12 June 2020, Germany sent an initial pre-notification paper regarding the planned support scheme ('*Erneuerbare Energien Gesetz*', hereinafter 'EEG') for the promotion of the production of electricity from renewable energy sources ('RES electricity') and from mining gas[1], as well as shore-side electricity supply to ships in harbour and a prolongation and modification of a reduction from renewable surcharges ('the EEG surcharge') for energy-intensive undertakings ('EIUs') including hydrogen.

(2) A conference call was held on 19 June 2020 and a list of questions sent to Germany on 23 June 2020. Germany sent responses, a draft of the law and the evaluation report of the predecessor support scheme, EEG 2017 (SA.45461), on 26 August 2020. A conference call was held on 22 September 2020 and a revised version of the draft law sent on 24 September 2020. The Commission sent a

[1] This decision does not cover in particular the South quotas and tenders, the follow-up support to waste wood (§101), follow-up support to small manure installations (§88b), follow-up support to large onshore wind installations, the ex-post increase of remuneration to hydropower installations and support to non-independent parts of undertakings receiving surcharge reductions for EIUs in the hydrogen sector, as well as support to green hydrogen in the form of EIU reductions. It also doesn't cover certain categories of surcharge reductions, which are covered by the existing State aid decisions in cases SA.46526 and SA.49522.

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further list of questions on 2 October 2020. On 13 October 2020, Germany formally notified the scheme under Article 108.3 of the Treaty on the Functioning of the European Union ("TFEU") and responded to the questions on 15 October 2020 and 2 November 2020.

(3) The Commission sent follow-up questions on 9 November 2020. Germany sent responses on 12, 16 and 17 November 2020. Conference calls took place on 18 and 23 November 2020. Germany sent further information on 24 and 30 November and 1 December 2020. The Commission sent further questions on 30 November 2020. Germany sent responses on 3 December 2020, and further information on 7, 8, 10 and 11 December 2020. Germany sent the law as voted by the Parliament on 18 December 2020 and a consolidated version of the law on 12 January 2021. A conference call was held on 25 January 2021. The Commission sent further questions on 26 January 2021. Germany sent responses on 29 January and 1 February 2021. The Commission sent further questions on 5 March 2021. Germany sent responses on 11, 15 and 19 March 2021.

(4) During a video conference meeting on 18 November 2020, the Commission services informed Germany that the evaluation report of the EEG 2017 (see recital (2)) was deemed sufficient. It was emphasised that a satisfactory solution on the future evaluation plan is necessary for not objecting to the evaluation report submitted on 26 August 2020. On 11 March 2021, Germany submitted the final draft of the revised evaluation plan of the EEG 2021.

(5) By letter dated 16 November 2020, Germany agreed exceptionally to waive its rights deriving from Article 342 TFEU in conjunction with Article 3 of Regulation 1/1958[2] and to have the present decision adopted and notified in English.

2. DETAILED DESCRIPTION OF THE MEASURE/AID, INCLUDING:

(6) The measures notified and assessed in this decision relate to (i) the support of production of electricity generated from new and modernised renewable installations[3][4] and mine gas, as well as to (ii) reductions in funding support for electricity from renewable sources for (a) energy-intensive undertakings (including hydrogen) and (b) shore-side electricity supply to ships in harbour (all together "the measures").

2.1. National legal basis, background and objective

(7) The notified scheme follows the EEG 2014 (approved by Commission decision in case SA.38632[5]) and the EEG 2017 (approved by Commission decision in case

[2] Regulation No 1 determining the languages to be used by the European Economic Community (OJ 17, 6.10.1958, p. 385).

[3] Support to offshore wind installations connected to the grid has been approved in case SA.57610 (2020/N).

[4] To ensure conformity with legislation on Renewable Energy, aid for possible mixed installations supporting together the RES electricity with other energy such as mine gas, requires to be accounted in line with principles and methods of Directive 2018/2001/EU.

[5] Decision of 23.07.2014, C(2014) 5081 final, State Aid SA.38632 (2014/N) – Germany EEG 2014 – Reform of the Renewable Energy Law (OJ C 325, 02.10.2015, p. 1).

SA.45461[6] until 31 December 2020 and prolonged in the Commission decision in case SA.59842[7] until 31 December 2021). It prolongs the previous schemes, but also significantly modifies them and adds additional measures.

(8) The scheme is included in the Law amending the Renewable Energy Law as well as further energy-related legislation ('*Gesetz zur Änderung des Erneuerbare-Energien-Gesetzes und weiterer energierechtlicher Vorschriften*'). This law amends the EEG 2017 (which now becomes the 'EEG 2021'), as well as further legislation relating to electricity from renewable sources. It was adopted on 18 December 2020 and entered into force on 1 January 2021, under the suspensive condition of State aid approval by the Commission.

(9) The EEG 2021 increases the ambition foreseen in the EEG 2017, and it targets a share of RES electricity of 65% by 2030[8]. This translates to the following annual targets as regards RES electricity production:

in TWh	2021	2022	2023	2024	2025	2026	2027	2028	2029
RES	259	269	281	295	308	318	330	350	376

Table 1: Annual RES electricity production targets.

(10) In 2019, electricity production from RES amounted to 242.5 TWh. RES electricity therefore represented around 39.75% of electricity production in Germany. The main RES electricity sources are wind, biomass and solar.

(11) This increase of the RES electricity share should be cost efficient, maintain public acceptance and be sustainable for the grid.

(12) In order to ensure cost efficiency of support and to steer the expansion of RES installations in accordance with the targets and in synchronisation to grid developments, the EEG 2021 (like the EEG 2017) provides for tenders to select RES electricity producers eligible for support when their installation reaches certain installed capacity and makes use of certain technologies. For other cases, it provides for feed-in tariffs or feed-in premiums based on a pre-determined reference value.

(13) The EEG 2021 sets out the following capacity expansion paths that can be derived from the overall installed capacity per RES category:

in GW	2020	2022	2024	2026	2028	2030
Onshore wind	54	57	62	65	68	71
Solar	52	63	73	83	95	100
Biomass	9.1					8.4

Table 2: RES capacity expansion paths (cumulative capacity).

6 Decision of 20.12.2016, C(2016) 8789 final, State Aid SA.45461 (2016/N) – Germany EEG 2017 – Reform of the Renewable Energy Law and State aid SA.44679 (2016/N) – Germany - Modification of the method used to define electro-intensity under the EEG (OJ C 68, 03.03.2017, p. 1).

7 Decision of 17.12.2020, C(2020) 9344 final, State Aid SA.59842 (2020/N) – Germany Modification to SA.45461 and SA.44679 (OJ C 17, 15.01.2021, p. 1).

8 Germany has provided a rough estimate that support awarded through RES tenders so far has led to an estimated 718 mio tCo2 emissions avoided.

(14) Germany has translated this to the following tender quantities (taking into account estimated decommissioning dates of existing capacity and realisation periods for capacity awarded in tenders), which are specified until 2028, as installations awarded up to 2028 are realised before and up to 2030 and therefore impact the achievement of the 2030 target:

In MW	2021	2022	2023	2024	2025	2026	2027	2028
Onshore wind	4500	2900	3000	3100	3200	4000	4800	5800
Ground-based PV[9] (750 kW+)	1850	1600	1650	1650	1650	1550	1550	1550
Rooftop PV (750 kW+)[10]	300	300	350	350	400	400	400	400
Biomass	600	600	600	600	600	600	600	600
Biomethane	150	150	150	150	150	150	150	150
Innovation[11]	500	600	600	650	700	750	800	850

Table 3: RES tender capacities per technologies until 2028.

(15) §99 EEG 2021 provides that at the latest by 2027, the German government will assess the need for modifications, including an assessment whether support payments are still necessary.

2.2. Beneficiaries

(16) RES electricity and electricity from mine gas eligible for support under the EEG 2021 are hereinafter designated collectively as 'EEG electricity'[12]. Beneficiaries are the producers of EEG electricity. The electricity eligible for support is on the one hand RES electricity: hydropower, including wave power, tidal power, salt gradient and flow energy, onshore wind energy, solar, geothermal energy, energy from biomass, including biogas and biomethane, as well as the biodegradable fraction of municipal waste and industrial waste, landfill gas and sewage treatment gas. On the other hand, also electricity produced from mine gas is eligible for support. EEG electricity that has been stored before being fed into the grid is also eligible for support[13].

(17) As regards shore-side electricity, Germany has confirmed that the reduced EEG surcharge will be passed on in full to the end consumers who will thus benefit from the aid, i.e., ship operators of seagoing ships at berth who purchase the electricity with a reduced EEG surcharge of only 20% of the original EEG surcharge.

2.3. Aid award

(18) Installations with an installed capacity above 750 kW (for onshore wind and PV, both ground-based and rooftop), 150 kW (for new biomass and biomethane

9 PV stands for photovoltaic solar energy.
10 And 300-750 kW voluntary.
11 The category "Innovation" concerns the quantities tendered in the so-called "innovation tenders", see section 2.6.1.6 for further details.
12 The qualification of aid as eligible for support under 'EEG electricity' is without prejudice to accounting of renewable energy in line with the principles and methods of Directive 2018/2001/EU.
13 The level of support is determined by the point in time that the electricity would have been fed into the grid absent storage (§19(3) EEG 2021).

installations) and all existing biomass installations will be eligible for support only if they have been selected in tenders.

(19) Installations up to these thresholds are exempt from the tender scheme. For these installations, the level of funding (feed-in tariffs) or the reference value is set by law. Rooftop PV installations between 300 and 750 kW can choose between a feed-in premium based on an administratively set reference value and participating in tenders. This option is explained by the existence of different business cases for installations in this size category: they are either geared towards feed-in into the grid, as is generally required for beneficiaries awarded in the tenders, or towards significant self-consumption. If installations between 300 and 750 kW opt for the latter, they will only be remunerated for 50% of the produced electricity, as the other 50% is assumed to be monetised through self-consumption or direct marketing without support in this business case. The threshold of 50% has deliberately been chosen rather low, in order to allow a clear distinction between business cases and avoid inefficient arbitrage between support possibilities.

(20) Also exempt from the tender system are certain technologies: for installations producing electricity based on hydropower, geothermal power, landfill, sewage and mine gas, the level of funding continues to be set by law as under the EEG 2014 and EEG 2017.

(21) Pilot installations are also exempt from tenders. These are:

a. Onshore wind installations showing innovative technical characteristics and requiring individual certification. Only the first two prototypes of the wind turbines concerned can qualify as pilot installations and they may not have a rated capacity of more than 6 MW.

b. Onshore wind installations which are mainly dedicated to research and development and which are testing a significant innovation going well beyond the state of the art.

(22) Germany has explained that the category b of recital (21) above corresponds to the concept of demonstration projects within the meaning of paragraph 19(45) of the Guidelines on State aid for environmental protection and energy 2014-2020[14] ('EEAG'). Germany also explained that to show the existence of a significant innovation going well beyond the state of the art, it will thus be necessary to demonstrate that the technology is entirely new, i.e. that it is the first of its kind in the Union.

(23) The EEG 2021 applies to installations entering into operation as of 1 January 2021 (for administratively set remuneration) and to installations receiving a tender award as of 1 January 2021 (for remuneration allocated through tenders).

2.4. Form of Aid and level of support

2.4.1. Feed-in premium and feed-in tariff

(24) As was already the case under the EEG 2017, the aid is paid as a market premium ('*Marktprämie*') that is obtained on top of the market price for the electricity. The

[14] OJ C 200, 28.6.2014, p. 1.

premium is paid out by the network operator to whose network the EEG electricity installation is connected. The methodology to determine the market premium based on an administratively set reference value is established in Annex 1 to the EEG 2021.

(25) The premium is a sliding premium: it corresponds to the difference between a reference value ('*der anzulegende Wert*') and the market price of the electricity. The reference value aims at covering the production costs of the electricity concerned, a reasonable return and a management premium to cover the costs of direct marketing. For installations subject to tendering, the reference value is determined by the tender; for installations not subject to tenders, the reference value is set in the EEG. The installations are obliged to sell their production on the free market for electricity ('direct marketing').

(26) However, electricity produced in installations with an installed capacity of 100 kW maximum is still entitled to feed-in tariffs. When they apply for feed-in tariffs, they transfer their electricity to the network operator to which they are connected and obtain the feed-in tariff.

(27) Feed-in tariffs are fixed by law. They differ for the various energy sources or technologies used and vary according to the capacity of the power plant. The feed-in tariffs correspond to the reference values minus 0.2 ct/kWh (for dispatchable installations[15]) or 0.4 ct/kWh for non-dispatchable installations (wind and solar) (§53(1) EEG 2021). In the framework of reference values, the 0.2 ct/kWh or 0.4 ct/kWh are covering marketing costs of non-dispatchable or dispatchable installations. Marketing costs will arise for EEG electricity operators selling their electricity directly on the free market for electricity. EEG electricity operators that benefit from feed-in tariffs do not face these costs, as the sale is carried out by the Transmission System Operators ('TSOs').

(28) In addition, the EEG 2021 maintains the fall-back feed-in tariff ('*Ausfallvergütung*') introduced in the EEG 2014: electricity operators producing renewable electricity in installations with installed capacity of more than 100 kW can temporarily obtain a feed-in tariff and transfer their electricity to the network operator to which they are connected when they cannot find a buyer for their electricity. The feed-in tariff is limited to 80% of the reference value. In addition, it is limited to three months in a row and to six months per year in total. Beyond those periods of time, the feed-in tariff is still available, but limited to the monthly average market price. Germany has provided information that since 2015 only about 80-100 MW (i.e. 0.1% of installed capacity) rely on the fall-back feed-in tariff and a majority of 80% of operators using the fall-back tariff only do so in one year.

(29) Operators of EEG electricity installations also have the possibility to sell their electricity directly on the market without requesting any support under the EEG (§21a EEG 2021 – '*sonstige Direktvermarktung*'). Only in that case, they are entitled to a guarantee of origin for the electricity concerned and will be able to sell the electricity as renewable electricity (§79 EEG 2021), in order to avoid cumulation issues.

[15] Dispatchable energy sources are energy sources that can be ramped up or shut down in a relatively short amount of time according to pre-determined planning instead of depending on a natural resources (such as wind or sun).

(30) At the beginning of each month, EEG electricity operators can change the way they sell their electricity (subsidised or other direct marketing, feed-in tariffs for small installations or fall-back feed-in tariffs) (§21b EEG 2021).

(31) Finally, certain biomass installations, which receive support for the production of RES electricity, under certain conditions can also apply for payments for flexibility (see section 2.5 below).

(32) Support is granted for 20 years, except for existing biomass installations where the support is limited to 10 years.

2.4.2. Level of support and market price

(33) When selling the EEG electricity on the market, operators are subject to balancing responsibilities according to §20 EEG 2021 and §4 Stromnetzzugangsverordnung. In particular, they must be part of a balancing group, in which the balancing of the electricity is ensured.

(34) According to §51 EEG 2021, when market prices are negative for at least 4 hours on the spot market, the reference value is set to zero and no remuneration will be paid for the period during which the prices were negative. This rule does apply for all plants above 500 kW, except onshore wind pilot installations. For installations awarded in tenders, the hours during which no remuneration is paid due to negative prices are added at the end of the support period (§51a EEG 2021).

(35) The premium and the feed-in tariffs are obtained only on the basis of electricity that is injected into the grid. In addition, producers of RES electricity whose reference value has been determined through tenders generally cannot use the electricity for self-consumption (§27a EEG 2021), except for narrow exemptions defined in the law. In certain cases, no remuneration is paid when certain formal conditions are not met (§52 EEG 2021).

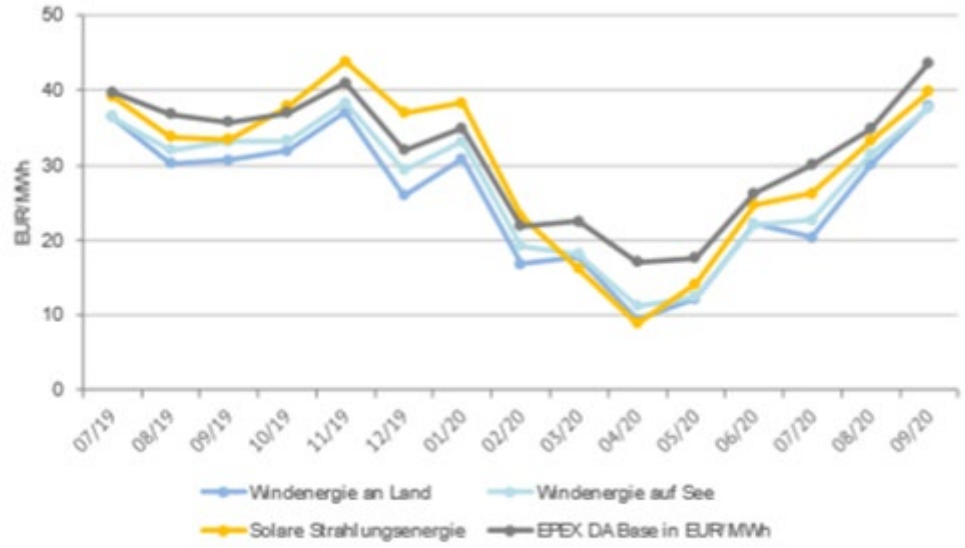
(36) The market value corresponds to the annual average price that serves as a reference for the specific energy source concerned. This is a change compared to the EEG 2017, where it was the monthly average price. The reference is calculated differently depending on whether the electricity production can be steered (hydropower, landfill gas, sewage treatment gas, mine gas, biomass and geothermal energy) or is intermittent (wind, solar).

(37) For dispatchable sources, it corresponds to the actual annual average price. For intermittent sources, the actual production from the respective source in each hour is taken into account for the calculation of the annual average. The TSOs have to publish on a common website the data used to calculate these averages.

(38) Germany has explained that the duration of the reference period was increased from monthly to annual, in order to increase the incentives for installations to be conceived, to produce electricity and to sell it in a way to maximise their revenues based on market signals over the entire year.

(39) The new system of annual average price is applied to new installations entering into operation or receiving a tender award as of 1 January 2023 (Annex 1 of the EEG 2021).

(40) The graph below gives an overview of the monthly base prices and market values for wind and solar between July 2019 and September 2020.



[Quelle: MONITORING DER DIREKTVERMARKTUNG: QUARTALSBERICHT (09/2020); eigene Darstellung Energy Brainpool nach EPEX Spot und netztransparenz.de]

Figure 1: Monthly base prices and market values July 2019 - September 2020.

2.5. Flexibility remuneration for biomass

(41) Finally, for biomass, §50-§50b EEG 2021 also provide for flexibility payments (for new and existing installations awarded in tenders) and flexibility premiums (for existing installations commissioned before 1 August 2014). They are paid to biomass installations receiving RES support if they fulfil the further condition that (i) for biogas, in the relevant year they produce in at least 4000 quarterly hours for at least 85% of their installed capacity or (ii) for biomethane installations, in the relevant year they produce in at least 2000 quarterly hours for at least 85% of their installed capacity. The flexibility remuneration is linked to the payment of the RES support. A cumulation of flexibility premium and flexibility payment for the same capacity is excluded (§50a(1) EEG 2021).

(42) The rationale is to cover the cost of investing in a flexible installation. Provided the necessary equipment is installed, the production of electricity from biogas can to a certain extent be adapted to the needs of the demand-side. In general, biogas installations are operated so as to maximize production, which results in a constant output. A flexible installation allows that for the same amount of electricity produced over the year, the major part of the electricity is produced during peak demand hours. Germany would like to promote this type of technology, given that it can make a valuable contribution to the system and integration of renewable energies into the free market for electricity.

(43) Flexibility is ensured by remunerating only part of the produced electricity from biomass and biogas capacity (75% for solid biomass, 45% for new and large biogas with an installed capacity over 100 kW or 50% for small biomass) and by foreseeing flexibility criteria to ascertain eligibility for the flexibility remuneration.

(44) While the flexibility allows producers to steer production of electricity so as to produce it in particular when demand and thus market prices are high, the additional revenues that can be achieved on the market when the electricity is produced during peak demand times are not sufficient to cover the additional costs resulting from installing the flexibility equipment. Germany claims that this is the case as long as more polluting sources are still being phased out and therefore overcapacity exists. The flexibility premium serves to cover this part of the additional costs that cannot be recouped thanks to higher market prices.

(45) The EEG 2021 differentiates between new biogas installations and existing biogas installations.

(46) For existing installations which were commissioned before 1 August 2014 and that invest in additional capacity in order to make the installation flexible, the flexibility premium is calculated individually for each installation and depends on the technical parameters of the installations. To incentivise a flexible and demand-driven production, the more the installation is flexible, the higher the premium. The flexibility premium is only granted for a maximum of 50% of the installed capacity (Annex 3 II 2.2 of the EEG 2021). The premium will be highest when the installation can allow for a 12-hour shift in production (from low peak demand to high peak demand).

(47) The flexibility premium ('FP') is calculated as follows:

$$FP = \frac{P_{Zusatz} \; x \; KK \; x 100 \frac{Cent}{Euro}}{P_{Bem} \; x \; 8760h}$$

(48) KK (capacity component) is currently established at 130 EUR/MW. P_{Bem} is the rated capacity, and P_{Zusatz} is the additional installed capacity (maximum 50% of the installed capacity) provided to generate electricity on a demand-basis in kilowatts and in the respective calendar year. This mechanism was already part of the EEG 2014 and EEG 2017, and is described in detail in decision SA.38632.

(49) For new and existing[16] biogas installations above 100 kW, the flexibility payment amounts to 65 EUR/kW per year and is paid out on the installed capacity of the installation for the entire period that the installation owner is entitled to obtain RES support.

(50) The flexibility payment serves to cover the average expected costs of constructing and maintaining additional flexible generation capacity and where necessary, gas and heat storage. The amount of the flexibility payment has been calculated so as to cover the average additional costs incurred for the provision of flexible generation capacity during the 20 years that the installation can also obtain RES support. The flexibility payment is granted on the entire installed capacity and has been calculated by taking into account additional revenues that can be obtained thanks to a flexible operation of the installation.

[16] That were awarded in a tender. They receive the flexibility payment for the duration of the remaining support period of 10 years after they switched to the new remuneration.

(51) Germany has confirmed that the flexibility premium and payment is a reshaping of support, i.e. that the overall support paid out is not higher than what could be expected if regular support was paid out for each kWh produced of the total capacity of the installation.

(52) Germany has provided initial figures showing that installations using the flexibility premium or payment showed an average of 4800 full-load hours in 2017 compared to 7700 full-load hours for installations not using the flexibility premium. This will further be analysed as part of the evaluation.

2.6. Tenders

(53) Where aid is granted by way of tenders, installations will be eligible for support only if they have made a successful bid. Tenders will be conducted by the Federal Network Agency (the Bundesnetzagentur, 'BNetzA').

(54) The calls will invite single, sealed bids. The bid relates to the reference value ('*anzulegender Wert*') that serves to determine the level of the premium after deduction of the market price.

(55) A security must be lodged to ensure the realisation of projects. The level of the security can vary per technology, depending on the level of eligibility conditions determining how advanced a project has to be at the time of tender participation.

(56) Bids may not exceed the maximum price (or bid cap), which will be published in advance.

(57) The lowest bids will be awarded funding until the amount of installed capacity that is being tendered is reached. There are specific rules for undersubscribed tenders for onshore wind and biomass. In principle, in all tenders, the amount of funding corresponds to the individual bid (pay-as-bid principle).

(58) Once a bid has been accepted, the project must be implemented within a specified timeframe. In the interest of maximising the rate of project implementation, a contractual penalty applies in the event of non-completion of a project.

(59) In general, the tenders are organized for each technology or even sub-segment of a technology separately:

- onshore wind;
- ground-based PV;
- rooftop PV;
- biomass and biogas; and
- biomethane.

(60) In addition, two annual innovation tenders are organised, which span several technologies (see section 2.6.1.6 below); and the law provides for the possibility to carry out cross-border tenders (see section 2.6.1.7). On the other hand, joint tenders for onshore wind and PV, as were conducted under the EEG 2017, are not provided for anymore in the EEG 2021.

(61) Germany submits that, through the innovation tender, a technologically neutral element is maintained in the tenders. Germany also insists that due to its

geographical situation, as well as network and system integration considerations, it is important to have a diverse mix of technologies, as onshore wind and solar PV complement each other's feed-in (both throughout seasons and various weather conditions), whereas biomass provides a dispatchable production source and has much higher cost. Germany cites their experience with past joint tenders for solar and onshore wind, in which only solar projects were awarded. Germany also submits that it is very difficult to design truly tech-neutral tenders, as the various technologies differ as regards project implementation speed, cost, eligibility conditions and penalties, which renders joint tenders complex. According to Germany, a particular difficulty is the internalisation of system integration costs into the tenders. Germany argues that these arguments become more significant the higher the share of RES is in electricity production. Germany therefore considers the continued separation of tenders per technology justified.

(62) As regards the newly introduced split between ground-based and rooftop PV (the EEG 2017 stipulated joint tenders for all PV projects above 750 kW), Germany submits the following justification: the cost differences between the two categories have proven significant.

Größenklasse	2015	2016	2017	2018
100 bis 250 kW	146 MW (917)	48 MW (288)	93 MW (523)	138 MW (779)
250 kW bis 500 kW	114 MW (307)	60 MW (166)	125 MW (355)	195 MW (549)
500 kW bis 750 kW	7 MW (12)	35 MW (57)	163 MW (239)	283 MW (413)
Größer 750 kW	36 MW (28)	242 MW (186)	*(13 MW (6))*	*(0 MW (0))*

Table 4: Deployed rooftop PV per year 2015-2018 (in MW and number of installations)

(63) As depicted in Table 4, since the introduction of joint tenders in 2017, only very few rooftop PV installations above 750 kW have been awarded in 2017 and none in 2018.

(64) Moreover, additional RES installations in particular on large rooftop surfaces will reduce the pressure on ground-based locations for PV.

(65) As regards the newly introduced separate category of tenders for electricity production from biomethane, Germany submits that these installations should be subject to a separate tender because they have higher levelised costs of electricity production ('LCOE') than other biomass/biogas technologies and therefore not been successful in past tenders. However, biomethane is particularly useful because of the additional flexibility it provides, as it can be stored and lead to an alleviation of system integration costs through the utilisation of the gas grid. Moreover, the support to biomethane installations will ensure the maintenance of demand for biomethane and therefore keep the upstream installations producing biomethane in operation, until biomethane is utilised in other sectors with few decarbonisation alternatives, such as industry and transport, in the longer term.

2.6.1. Technologies subject to tenders

2.6.1.1. Onshore wind

(66) Installations participating in the tenders must have obtained approval under the Federal Emissions Control Act (*Bundes-Immissionsschutzgesetz*, BimSchG, 'late tenders', i.e. at a late stage of project development).

(67) Funding will be tendered in three annual rounds (in February, May and September), to which the annually tendered capacity will be apportioned equally.

(68) The tendered capacity is adjusted each year, increasing as of 2024 by the capacity not having been awarded in the onshore wind tenders of three years ago and decreasing by the capacity awarded by other Member States to onshore wind projects located within Germany and the capacity of pilot onshore wind projects entering into operation in the preceding year. The tender quantity is also increased in line with non-realised capacity from previously awarded onshore wind projects[17].

(69) Onshore wind tenders have been generally undersubscribed, in particular in recent years with average bids close to the bid caps. Only the tenders of 2017 were oversubscribed, due to the participation of a high number of specially privileged citizen community projects.

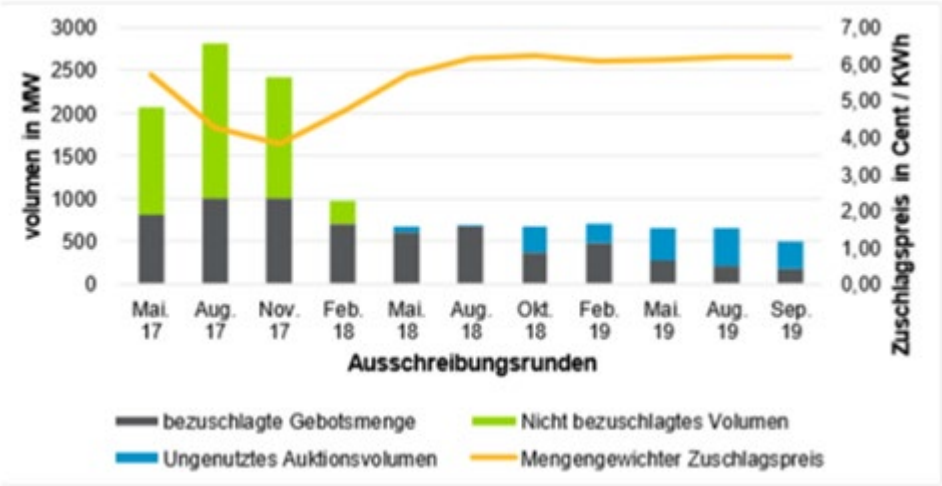


Figure 2: Bid capacity per tender and award price for onshore wind.

(70) According to Germany, the main reasons for the undersubscriptions is the limitation of surface areas designated for onshore wind developments, the low number of authorisations for onshore wind projects, lawsuits against approved projects and the lacking public acceptance on the ground. Germany has agreed an Action Plan for Onshore Wind in October 2019, which amongst others seeks to introduce more legal certainty in regional planning and an acceleration of permitting. Germany submits that the rate of permit granting has significantly accelerated in 2020 (compared to 2019). The EEG 2021 also provides for further monitoring in this regard.

[17] As of 1 January 2021.

(71) To address the risks of undersubscription, Germany has introduced a specific mechanism for onshore wind: if there is a risk of undersubscription for a tender, which can be indicated by, *inter alia*, a limited number of newly granted permits and limited tender participation in the past, BNetzA reduces the tender capacity to keep the tender competitive.

(72) The bid cap is fixed at 6.0 ct/kWh for 2021 with an annual decrease of 2% as of 2022. The applied guarantee payment amounts to 30 EUR/kW.

(73) Germany applies the reference yield model ('*Referenzertragsmodell*') for the calculation of the reference value. This means that bids are submitted in the tenders as if the wind projects had a fictitious 100% wind quality. After the projects have been awarded, their bid is transformed to the actual reference value by multiplying them with a factor depending on the actual estimated wind quality of the site for wind qualities between 60% and 150% (Annex 2, EEG 2021):

Güte-faktor	***60 Pro-zent***	70 Pro-zent	80 Pro-zent	90 Pro-zent	100 Pro-zent	110 Pro-zent	120 Pro-zent	130 Prozent	140 Pro-zent	150 Pro-zent
Korrek-turfaktor	***1,35***	1,29	1,16	1,07	1,00	0,94	0,89	0,85	0,81	0,79

Table 5: Reference yield model: Wind quality and reference value correction factors.

(74) Germany submits that the reference yield model favours installations in less windy areas, mainly in the German South, and can therefore support a more balanced installation of wind installations, which would be advantageous in terms of public acceptance and network constraints. Moreover, Germany is of the view that the reference yield model is an additional safeguard against windfall profits and leads to more competition in tenders.

(75) Due to undersubscription in past tenders, the reference yield model has not had an impact so far on the selection of onshore wind projects in Germany. This will change and the reference yield model will have an impact on the tender outcome, once the above-mentioned mechanism to prevent undersubscription is implemented. In light of this, the reference yield model will be closely analysed in the evaluation (see section 2.14 below) to assess its actual contribution to the advantages claimed above by Germany and balance them against potential unintended negative consequences. This will serve as a basis for the assessment of the reference yield model in future decisions.

(76) Awarded onshore wind installations must be built within 30 months of the tender award. This deadline can be extended in specific limited cases, for example where a lawsuit has been filed against a project. The law sets limits for the maximum possible extension.

(77) The EEG 2021 introduces provisions that allow projects to increase the installed capacity by up to 15% within the award they received. Moreover, they can once submit an additional bid ('*Zusatzgebot*'), when they want to increase the capacity by more than 15%. The bid value cannot exceed the awarded price for the initial project and the payment duration is aligned with the original award.

(78) The majority of specific provisions for citizens' onshore wind projects (as described in paragraphs (116) – (128) of the Commission decision in case SA.45461) have been abolished in May 2020 due to unintended consequences in the form of a hiatus of bids from such projects putting into question amongst others project realisation and therefore the targeted capacity expansion. However, citizens' onshore wind projects continue to be awarded pay-as-clear instead of pay-as-bid, as they have a less clear view of the market than more professional operators.

(79) The EEG 2021 introduces a provision allowing operators of onshore wind installations to offer the affected municipalities an amount up to 0.2 ct/kWh of electricity produced from the installations. If they do so, the operators receive the amount reimbursed by the respective system operator

(80) Germany submits that, through these payments, the affected municipalities would be remunerated for the impact of new installations, such as the visual impact, and therefore acceptance would be increased. Moreover, this would create an incentive for the designation of new areas for onshore wind development and to facilitate the installation of onshore wind projects on existing areas, which at the same time will increase the level of competition in the tenders.

2.6.1.2. Ground-based PV

(81) Tenders are open to installations for which the operator is the owner of the utilised plot or for which the owner of the plot has agreed to the submission of the bid. Participation is open to ground-mounted installations and PV systems installed on other types of physical structure, but certain restrictions apply as to the location of the PV systems. The maximum size of installations has been increased to 20 MW (from 10 MW) in the EEG 2021 in light of the increasing RES targets and technological improvements.

(82) Funding for all ground-based solar installations with a capacity over 750 kW will be tendered in 3 annual rounds (in March, June and November), to which the annually tendered capacity will be apportioned equally. The tendered capacity is adjusted each year, increasing as of 2022 by the capacity not having been awarded in the ground-based solar tenders of the preceding year (or for which no second guarantee was paid) and decreasing by the capacity awarded by other Member States to solar projects located within Germany and the capacity of ground-based solar installations remunerated through administratively set support entering into operation in the preceding year. The tender quantity is also increased in line with non-realised capacity from previously awarded ground-based solar projects.

(83) The bid cap amounts to 5.9 ct/kWh for 2021 and as of 2022 is calculated as the average of the highest bid awarded in each of the last three tenders increased by 8%, but can never be higher than 5.9 ct/kWh.

(84) Guarantee payments amount to a first guarantee of 5 EUR/kW (at the moment of submission of the bid) and an additional second guarantee of 45 EUR/kW (with a derogation of 20 EUR/kW in case of specific situations which increase the likelihood of realisation of the project).

(85) The project has to be finalised within 24 months of the award, with a penalty applying as of 18 months after award.

(86) Participation in tenders will mainly be open to solar installations mounted in or on:

- road and rail-side strips of land (200 metres wide alongside motorways and railways (increased from 110 metres),
- conversion areas,
- sealed areas,
- disadvantaged areas, to a limited extent; this is subject to a regional enabling clause, whereby the governments of the Länder can adopt a regulation allowing further arable land or green spaces in disadvantaged areas to take part, and
- land administered by the Institute for Federal Real Estate (BImA).

(87) These locational restrictions aim at ensuring that only a limited amount of arable land and of areas that are key to conservation is used for installing PV systems.

(88) In the past, competitive pressure in solar PV tenders has been high with tenders being up to four times oversubscribed, which has also translated into generally decreasing average bid values, even though the most recent tenders have shown a slight increase. There are no indications for a decreasing trend in the future.

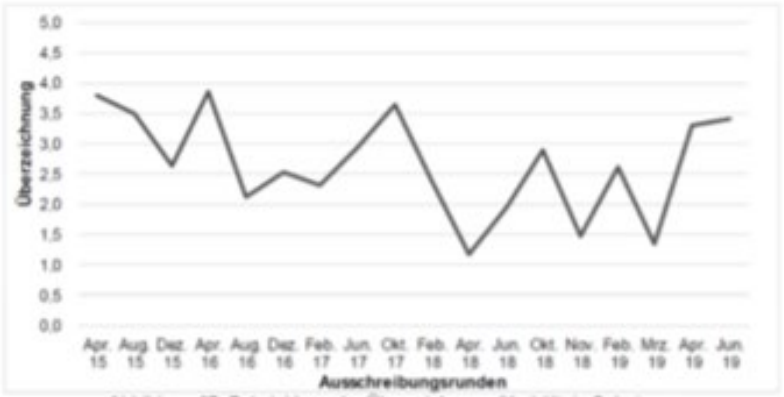


Abbildung 67: Entwicklung der Überzeichnung (Verhältnis Gebots- zu Ausschreibungsvolumen)

Figure 3: Bid and tendered capacity per tender round (solar PV).

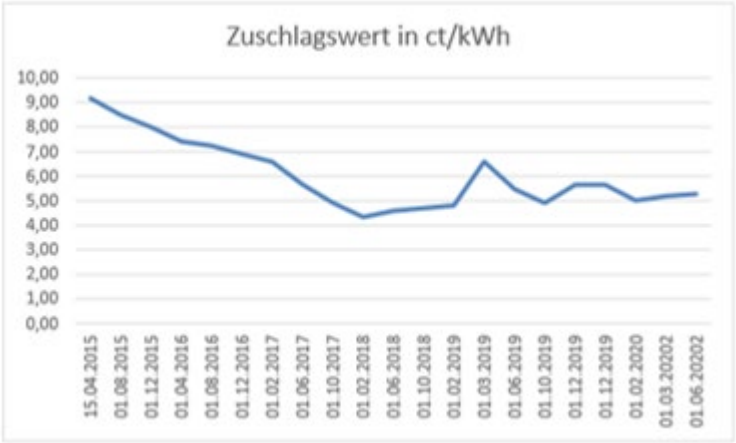


Figure 4: Awarded reference value per tender (solar PV).

2.6.1.3. Rooftop PV

(89) The EEG 2021 creates a new tender category of rooftop PV, which in the EEG 2017 was part of an overall PV tender. Participation will be open to PV systems installed on buildings or noise-protection walls. The maximum bid of installations has been increased to 20 MW (from 10 MW) in the EEG 2021.

(90) Funding for all rooftop solar installations with a capacity over 750 kW will be tendered in 2 annual rounds (in June and December), to which the annually tendered capacity will be apportioned equally. The tendered capacity is adjusted each year, increasing as of 2022 by the capacity not having been awarded in the rooftop solar tenders of the preceding year. The tender quantity is also increased in line with non-realised capacity from previously awarded rooftop solar installations.

(91) Germany has explained that for the tender quantity they have verified the number of installations and capacity remunerated in the past. In the years 2010-2019, capacity additions of rooftop PV installations between 300 and 750 kW amounted to 400 MW on average (120 MW above 750 kW). Moreover, Germany submits that in the segment just below 750 kW (700-750 kW), there were high capacity additions in the last two years (400 and 460 MW respectively), which point to a high potential of additional capacities, once there is a separate tender for this segment. Together with the opt-in for installations between 300 and 750 kW, Germany submits that they expect these tenders to be competitive.

(92) The bid cap is set at 9.0 ct/kWh with an annual decrease of 1%.

(93) Guarantee payments amount to 70 EUR/kW, as no authorisation is necessary for this type of installations and therefore the realisation probability is lower. Installations have to be finalised within 12 months of the award, with a penalty applying as of 8 months.

2.6.1.4. Biomass and biogas

(94) Tenders will also be conducted for new biomass installations with an installed capacity of at least 150 kW and existing installations of all sizes. However, installations may not be larger than 20 MW.

(95) The aid to existing installations is limited to ten years, if they receive an award and existing installations are eligible only if at the moment of the tender they are still entitled to support under the version of the EEG applicable to them for a maximum of 8 remaining years. As biomass/biogas installations under the EEG are entitled to support for 20 years plus the year in which they entered into operation, the installations concerned should at the latest have entered into operation in 2007, i.e. 13 years before 2020 (so that maximum 8 years of support are left for these installations). The number of installations in that situation will be increasing over the coming years, as about 5 GW of biomass installations will reach the end of their support period by 2030. Germany itself expects an intensification of participation of existing plants in particular as of 2026.

(96) Existing biomass installations of up to 150 kW have the possibility to participate in tenders. Their reference value will be determined based on the pay-as-clear method, while the other applicants will be cleared based on the pay-as-bid rule. This possibility also aims to facilitate the participation of very small biomass projects in tenders. Those very small installations are operated by small farmers with no experience in tenders and no market visibility. They also often have slightly higher production costs. Germany expects that allowing them to bid based on the pay-as-clear rule would allow them to bid their real costs and slightly increase their chances of submitting a winning bid, and thus also increase the incentive for them to take part in such tenders and ultimately modernise their installations. In past tenders, 20 small installations participated and were awarded over three tenders, for an overall capacity of less than 2 MW. Germany therefore submits that the impact on the tenders has been limited.

(97) Funding will be tendered in two annual rounds (in March and September), to which the annually tendered capacity will be apportioned equally. The tendered capacity is adjusted each year, increasing as of 2024 by the capacity not having been awarded in the biomass/biogas tenders of three years ago, and decreasing by the capacity of biomass/biogas installations remunerated through administratively set support entering into operation in the preceding year, half of the capacity of combinations of installations including biomass awarded through the innovation tender of the preceding year and the capacity of installations fed by liquid manure receiving a follow-up remuneration based on an ordinance in accordance with §88b EEG 2021, once this provision enters into force. The tender quantity is also increased in line with non-realised capacity from previously awarded biomass installations.

(98) If existing installations are selected, the new remuneration will replace the previous one. The operators of the existing installations can choose a date of entry into force between 3 (instead of 13 previously) and 36 months after announcement of the winners of the tender. As of the date of the switch, the existing installations will be considered new installations and will be subject to the same requirements as installations entering into operation after 31 December

2020 (approval under the Federal Emission Control Act, biomass type, flexibility, etc.).

(99) Tenders will be open to installations that have obtained approval under the Federal Emissions Control Act ('late tenders' like for onshore wind). If installations do not require approval under the Federal Emissions Control Act, a building permit will suffice.

(100) Installations are also subject to requirements linked to the type of biomass that they use, such as the share of corn or grain that the installation uses for to produce biogas (§39i EEG 2021).

(101) The EEG 2021 increases the bid caps to 16.4 ct/kWh for new biomass installations and 18.4 ct/kWh for existing installations. The slightly higher cap for existing installations results from the fact that the follow-up premium is granted only for 10 years and takes into account the fact that existing biomass installations can cover a large variety of different biomass types, while for new biomass installations the focus is on cheaper raw materials. Those caps will decrease by 1% every year as of 2022. An additional cap applies to existing biomass installations selected in the tender: their applicable reference value may not exceed, irrespective of their bid, the average reference value that applied to the concerned installations in the three last years preceding the tender. Lower caps also exist for specific types of biogas (§39(i)(3) EEG 2020). For the tenders of 2021 – 2025, existing and new installations below 500 kW will receive an increment of 0.5 ct/kWh to the reference value awarded through the tender, allowing them to be a bit more competitive by pricing this into their bids and therefore slightly increasing their chances of getting awarded.

(102) Germany has explained, also through LCOE calculations, and the evaluation report confirmed that the production costs of biomass installations depend significantly on the raw material used for the biomass, on the installation technology used and on the installation size.

(103) The guarantee amounts to EUR 60/kW and the installations have to start operation at the latest 36 months after the award (instead of 24 months under the EEG 2017). This deadline can be prolonged by up to 48 months in case of court cases.

(104) Renewable biomass and biogas installations in Germany represented 20.6% of renewable electricity production in Germany in 2019. As biomass and biogas installations provide a relatively stable electricity production, Germany has underlined that biomass and biogas installations can make an important contribution to grid stability and reduce system costs given also their relative share in the renewable electricity mix, while at the same time contributing to the renewable targets. This is the more so given that biogas and biomass installations can – if correctly equipped – be operated flexibly so as to adapt production to electricity demand. Basically, they can run at a certain level of their capacity in a stable manner and in case of peak demand or sudden decrease of production from other electricity generation sources, they can increase their production.

(105) So far, all biomass tenders have been undersubscribed with average bids close to the bid cap. Participation of new installations was very limited compared to existing installations.

Figure 5: Bid and tendered capacity per tender round (biomass).

Tabelle 19 Verteilung der Zuschläge auf Bestands- und Neuanlagen in den bisherigen Ausschreibungsrunden

	Sep. 17	Sep. 18	Apr. 19
Anzahl Neuanlagen	6[99]	13	2
Anzahl Bestandsanlagen	20	66	17

Figure 6: Awarded new and existing installations per tender round (biomass).

(106) Germany submits that the undersubscription is due to the fact that the bid cap was set too low, not allowing a profitable operation of installations. Moreover, from 2020 onwards, existing installations (those that entered into operation in 2000 and the following years) reach the end of their 20-year support duration, which could lead to increased participation in the tenders in the next years, when installations try to maximise their total support duration by submitting a bid for the 10-year follow-up support.

(107) To prevent the negative impact of undersubscription, Germany applies a rule where only 80% of submitted bids are awarded, in case there are not sufficient bids to cover the tendered capacity.

(108) Installations using biogas are only remunerated for the production from 45% of their capacity, those using solid biomass are only remunerated for the production of 75% of their capacity.

2.6.1.5. Biomethane

(109) Tenders will also be conducted for installations producing electricity from biomethane ('biomethane installations'). As biomethane is fed through the gas grid, operators of biomethane installations must prove the origin of their feedstock to ensure the exclusive use of biomethane. Except where specified, the same rules as for biomass/biogas installations apply. There will be one tender per year (in December).

(110) The bid cap is set at 19 ct/kWh and decreases by 1% per year. It has been calibrated based on the LCOE estimates displayed in Figure 7 below.

OHNE WÄRME	Stromgestehungskosten ct/kWhel Variation: Biomethanbezugspreis, ct/kWh Hs (inkl. Gasnetzentgelte)			
Erdgas-BHKW-Modul kWel	**9**	**8**	**7**	**6**
500 kWel	39,1	35,8	32,6	29,4
1.000 kWel	36,0	32,8	29,7	26,6
10.000 kWel	29,6	26,8	23,9	21,1
Höchstgebotswert EEG-2021 (19 ct/kWhel)	19,0	19,0	19,0	19,0
Höchstgebotswert inkl. Flexzuschlag (65 €/kW)	24,0	24,0	24,0	24,0
Mehrerlöse Flex 2 ct/kWhel	2,0	2,0	2,0	2,0
Erlöse gesamt	**26,0**	**26,0**	**26,0**	**26,0**

MIT WÄRME	Stromgestehungskosten ct/kWhel (mit Wärmeerlöse 2 ct/kWhth, 1300 h) Variation: Biomethanbezugspreis, ct/kWh Hs (inkl. Gasnetzentgelte)			
Erdgas-BHKW-Modul kWel	**9**	**8**	**7**	**6**
500 kWel	34,2	33,0	29,8	26,6
1.000 kWel	33,2	30,1	27,0	23,9
10.000 kWel	27,2	24,4	21,6	18,8
Höchstgebotswert EEG-2021 (19 ct/kWhel)	19,0	19,0	19,0	19,0
Höchstgebotswert inkl. Flexzuschlag (65 €/kW)	24,0	24,0	24,0	24,0
Mehrerlöse Flex 2 ct/kWhel	2,0	2,0	2,0	2,0
Erlöse gesamt	**26,0**	**26,0**	**26,0**	**26,0**

Figure 7: LCOE for biomethane depending on size and input cost.

(111) The remunerated capacity can only amount to 15% of the overall capacity of the installation, which translates to 1300 full-load hours per year. This incentivises the installations to be highly flexible.

(112) The tendered capacity is adjusted each year, increasing as of 2022 by the capacity not having been awarded in the biomethane tender of the preceding year. The tender quantity is also increased in line with non-realised capacity from previous awards to biomethane installations.

(113) Germany submits that they expect that tenders will be competitive, both from new installations and from the modernisation of the 556 MW of existing installations, a significant share of which is reaching the end of their technical life, which on average amounts to 8-10 years.

2.6.1.6. Innovation tenders

(114) As part of the EEG 2017 decision, Germany committed to carry out innovation tenders (50 MW annually) for installations providing specific services to the grid (for example, stable or flexible production by linking intermittent RES production with storage or by linking several intermittent RES installations with complementary feed-in profiles) (paragraphs 52 and 221 of the Commission decision in case SA.45461). The first such tender was foreseen for 2018, but was delayed and finally took place on 1 September 2020 for an increased volume of 650 MW.

(115) The innovation tenders are intended to test how to further incentivise the market and grid integration of RES installations. The aim is to provide a push for innovations, both technological innovations, as well as innovative ways to turn RES energy into more predictable/dispatchable forms of output in order to

optimise their use and availability. There are two annual tenders, on 1 April and 1 August of the year.

(116) Only combinations of installations are eligible, which means a combination either of several RES installations or of one or several RES installations with storage. One of the installations has to be a wind or solar installation. All installations have to be connected to the same grid connection point. The chosen flexibility criterion requires for 25% of the installed capacity to be able to provide positive secondary reserve. This has to be proven annually. It is assumed to be fulfilled if at least 25% of installed capacity is biomass, geothermal or storage. As regards storage, it has to be dimensioned to be able to absorb at least two hours of the installation group's production or to be qualified for positive secondary reserve.

(117) The remuneration will be paid as a fixed premium on top of the market price. The bid cap amounts to 7.5 ct/kWh with an annual decrease of 1%. In case the tender is undersubscribed, only the lowest 90% of bids in terms of capacity are awarded. Moreover, no remuneration is paid, as soon as the spot price is negative.

(118) The guarantee amounts to 60 EUR/kW and the installations have to enter into operation at the latest 30 months after the award.

(119) The capacity awarded to biomass/biogas installations will be deducted from the technology-specific biomass/biogas tenders. Germany has confirmed that total innovation tender capacities have been taken into account when defining the overall tender capacities to reach the RES targets.

(120) For 2022, a specific segment of 50 MW for installation groups including special solar installations ('*besondere Solaranlagen*') is provided for as part of the innovation tender. These are floating solar installations, installations installed above a parking area or a surface, which is used in parallel for agricultural purposes. The objective is to test concepts for creating additional space for solar installations. However, such more innovative models of solar installations are more expensive than the traditional ones, which is why Germany introduced this segment in the innovation tenders. The size of participating installations is limited to 100 kW – 2 MW to allow a number of installations to receive an award in the tender and gain experience with a range of projects. The same bid caps apply as for the general innovation tenders.

(121) An evaluation of the innovation tenders is foreseen by 31 December 2021.

2.6.1.7. Cross-border tenders

(122) In continuity with a similar provision under the EEG 2017, the EEG 2021 provides for the adoption of a regulation opening up to 5% of annual tendered capacity to bidders from other EU Member States with which Germany has concluded a cooperation agreement under Article 5 of the Renewable Energy Directive 2018/2001/EU[18] ('Renewable Energy Directive'). The tenders can be jointly organised or held by each partner State separately. Support also has to occur under the principle of reciprocity and there has to be physical import of the electricity concerned or an equivalent effect.

[18] Directive (EU) 2018/2001 of the European Parliament and of the Council of 11 December 2018 on the promotion of the use of energy from renewable sources (recast) (OJ L 328, 21.12.2018, p. 82).

(123) Based on the EEG 2014, the implementing regulation was adopted on 1 June 2016 (Cross-Border Renewable Energy Ordinance, *Verordnung zur grenzüberschreitenden Ausschreibung für Strom aus erneuerbaren Energien* - GEEV) and a cooperation agreement on the mutual opening up of tenders for ground-mounted photovoltaic installations was signed with Denmark in July 2016, which was followed by a pilot cross-border tender for ground-mounted PV installations with Denmark.

(124) Following the pilot cross-border tender with Denmark, Germany has discussed further cooperation with a number of other Member States, such as France, Luxemburg and Poland, but this has not led to new cooperation agreements so far. Germany continues to work towards further cross-border opening of support for RES, including at the European level.

2.6.2. Technologies and installations not subject to tenders

(125) For the technologies and/or sub-groups of installations below, Germany plans to continue providing support based on feed-in tariffs or premiums through reference values set by law, as they are small in size, demonstration projects and/or there are not enough projects expected for those technologies that would allow the organization of a competitive tender.

(126) The EEG 2021 establishes reference values for these installations, differentiated per technology and often also per capacity of the installation.

(127) Germany has indicated that before the appropriate level of the reference value for the EEG 2021 has been determined, studies and surveys have taken place so as to determine production costs for classes of technology and installations that are considered as representative based on the practice observed on the market. The determination of the production costs is made on the basis of data gathered from installation operators, installation producers, installing companies, completed by estimates of experts.

(128) The production costs taken into account include investment costs, a normal rate of return and operating costs, and have been determined on the basis of the LCOE methodology using the following formula:

$$LCOE = \frac{I_0 + \sum_{t=1}^{n} \frac{A_t}{(1+i)^t}}{\sum_{t=1}^{n} \frac{M_{el,t}}{(1+i)^t}}$$

mit:

I_0	*Investitionsausgaben*
A_t	*Auszahlungen/Kosten im Jahr t*
$M_{el,t}$	*produzierte Strommenge im Jahr t*
i	*Kalkulationszinssatz*
n	*kalkulatorische Nutzungsdauer*
t	*Jahr der Nutzungsperiode*

Stromgestehungskosten (Levelized Cost of Electricity – LCOE)

(129) Typically, operating costs cover variable costs depending on the use of the installation, like fuel costs and variable maintenance costs; running costs necessary for the operating of the installations, like labour costs, fixed maintenance costs and other costs like insurances. Certain installations based on certain technology (biomass and biogas plants) are usually functioning in

combined heat and power ('CHP') mode. For those installations, the revenues generated by the sale of heat are deducted from the production costs.

(130) Regarding the normal return on investment, the following rates of return were taken into account for the calculation of the production costs:

			Percentage	**Interest rate**
Hydropower	Private investor	Debt	70%	3.3%
		Equity	30%	5%
	Commercial investor	Debt	70%	3.3%
		Equity	30%	5%
Sewage, landfill and mine gas	Commerial investor	Debt	80%	2%
		Equity	20%	8%
Biomass	Small installations	Debt	90%	2%
		Equity	10%	6%
	Large installations	Debt	80%	2%
		Equity	20%	8%
Geothermal	Commercial investor	Debt	43%	4.9%
		Equity	57%	15.1%
Solar PV	Private investor	Debt	50%	2.8%
		Equity	50%	5%
	Commercial investor	Debt	75%	2.8%
		Equity	25%	8%

Figure 8: Breakdown of rates of return per technology.

(131) In general, the interest rates submitted are in line with or lower than the interest rates approved for the EEG 2014 (SA.38632). A notable difference is geothermal, where the interest rate is slightly higher than previously assumed. This is due to the fact that geothermal installations have a high realisation risk and only very few installations (on average one) are realised each year. These higher risks in particular relate to long planning durations and uncertainties as regards the availability of the resource.

2.6.2.1. Sewage, landfill and mine gas installations (§41 EEG 2021)

(132) As described in decisions SA.38632 (EEG 2014) and SA.45461 (EEG 2017), Germany had previously submitted that for sewage, landfill and mine gas installations, their numbers and the electricity produced from them was stable or decreasing. Germany has confirmed that this trend has continued in the recent years.

(133) The reference values have been updated in accordance with the EEG 2017 and now amount to:

	Landfill gas		Sewage gas		Mine gas		
Installation size in MW up to and including	0.5	5	0.5	5	1	5	larger
Reference value in ct/kWh	7.69	5.33	6.11	5.33	6.16	3.93	3.47

(134) These values are decreased by 1.5% per year.

Stromgestehungskosten für Klärgas, Deponiegas, Grubengas			
	Klärgas	**Deponiegas**	**Grubengas**
Eingangsparameter			
Inbetriebnahmezeitpunkt	01.01.2021	01.01.2021	01.01.2021
Kalkulatorische Nutzungsdauer	20 Jahre	10 Jahre	20 Jahre
Nennleistung	200 kW_{el}	500 kW_{el}	500 kW_{el}
Technologie	1 Gasmotor mit 200 kW_{el}	2 Gasmotoren mit je 250 kW_{el}	2 Gasmotoren mit je 250 kW_{el}
Wirkungsgrad elektrisch	40,2%	39,7%	39,7%
Wirkungsgrad gesamt	84,1%	85,2%	85,2%
Volllaststunden (Strom)	7.000 h/a	5.500 h/a	7.000 h/a
Preisänderungsrate	2%	2%	2%
Kapitalkosten			
Eigenkapitalanteil	20 %	20 %	20 %
Fremdkapitalanteil	80 %	80 %	80 %
Eigenkapitalzins	8 %	8 %	8 %
Fremdkapitalzins	2 %	2 %	2 %
Kalkulatorischer Mischzinssatz	3,2 %	3,2 %	3,2 %
Spezifische Investition	1.733 €/kW_{el}	1.481 €/kW_{el}	1.447 €/kW_{el}
Betriebskosten (*in % der Anfangsinvestitionen, **Bezug: Inbetriebnahmejahr 2021)			
Vollwartungskosten BHKW**	2,64 ct/kWh_{el}	2,66 ct/kWh_{el}	2,66 ct/kWh_{el}
Sonstige Instandhaltungskosten*	2 %/a	2 %/a	2 %/a
Versicherung*	1,2 %/a	1,2 %/a	1,2 %/a
Verwaltung*	1,0 %/a	1,0 %/a	1,0 %/a
Spez. Stromkosten** (Eigenstrombedarf Anlage)	18 ct/kWh	18 ct/kWh	13 ct/kWh
Strombezug (relativ zur Stromerzeugung)	4 %	4 %	4 %
Sonstige Betriebskosten*	2,6 %	8,8 %	2,0 %
Rückgang der Gasproduktion	-	3 %/a	-
Erlöse (***in Relation der technisch nutzbaren Wärmemenge am Beginn der Nutzungsdauer)			
Anteil genutzter Wärme***	20 %	5 %	-
Spezifische Wärmeerlöse	3 ct/kWh_{th}	3 ct/kWh_{th}	-
Mittlere Stromerzeugungskosten	8,15 ct/kWh	9,62 ct/kWh	7,12 ct/kWh
Vergütung EEG			
Anzulegender Wert (Entwurf EEG 2021)	6,11 ct/kWh	7,69 ct/kWh	6,16 ct/kWh
Vergütungsdegression für Neuanlagen (jeweils ab dem 01. Januar des Folgejahres)	1,5 %	1,5 %	1,5 %

2.6.2.2. Biomass/Biogas (§42-44 EEG 2021)

(135) For biomass and biogas installations, the reference values amount to:

	Biomass	**Liquid manure**	**Biodegradable waste**	
Rated capacity in MW up to and including (for liquid manure: installation size)	0.15	0.15	0.5	20
Reference value in ct/kWh	12.8	22.23	14.3	12.54

(136) The annual decrease amounts to 0.5%. Moreover, for liquid manure installations above 100 kW, only the electricity corresponding to 50% of installed capacity is remunerated; for biomass installations, this percentage amounts to 45%.

Stromgestehungskosten für Neuanlage (Biogas) – Güllekleinanlage 75 kW (Gülle-BGA-75)	
Eingangsparameter	
Inbetriebnahmejahr	01.01.2021
Kalkulatorische Nutzungsdauer	20 Jahre
Nennleistung	0,075 MW_{el} (66,78 kW Bemessungsleistung)
Technologie	Nassfermentation, Vor-Ort-Verstromung, Kraft-Wärme-Kopplung, Gas-Otto-Motor
Wirkungsgrad elektrisch	36 %
Wirkungsgrad thermisch	48 %
Volllaststunden	7.800 h/a
Brennstoffart	Mischsubstrat: 85 % Rindergülle, 15 % Maissilage; frischmassebezogen (FM)
Brennstoffkosten	40,00 €/t_{FM} für Maissilage, 0 €/t_{FM} für Rindergülle
Strombezugskosten	18,0 ct/kWh_{el}
Eigenstrombedarf	8 %
Eigenwärmebedarf	60 %
Wärmeauskopplung	20 %
Preissteigerung	Kapitalkosten: 1 %/a; alle anderen Kostenpositionen: 2 %/a
Anlegbare Wärmevergütung	2,0 ct/kWh_{th}

Kapitalkosten	
Eigenkapitalanteil	10 %
Fremdkapitalanteil	90 %
Eigenkapitalzins	6 %
Fremdkapitalzins	2 %
Kalkulatorischer Mischzinssatz i (nominal)	2,4 %
Spezifische Investition	7.665 €/kW_{el} (ohne Rückbau und Genehmigung; inkl. Genehmigung 8.050 €/kW_{el})

Kapitalgebundene Kosten	9,07 ct/kWh_{el}
Verbrauchsgebundene Kosten	8,96 ct/kWh_{el}
Betriebsgebundene Kosten	6,17 ct/kWh_{el}
Sonstige Kosten	1,76 ct/kWh_{el}
Summe Kosten	25,96 ct/kWh_{el}
Erlöse Wärmeverkauf	0,63 ct/kWh_{el}
mittlere Stromgestehungskosten wärmebereinigt	25,33 ct/kWh_{el}

Vergütung (EEG 2021)	22,23 ct/kWh_{el} (§44 EEG 2017)

Stromgestehungskosten Biogas (Neuanlage) – Gülle/NawaRo-BGA -150, Flex (45% Bemessungsleistung), Festvergütung	
Eingangsparameter	
Inbetriebnahmejahr	IBN 2022 (Neuanlage)
Kalkulatorische Nutzungsdauer	20 Jahre
Nennleistung	0,149 MW_{el} (67,5 kW Bemessungsleistung)
Technologie	Nassfermentation, Vor-Ort-Verstromung, Kraft-Wärme-Kopplung, Gas-Otto-Motor
Wirkungsgrad elektrisch	38 %
Wirkungsgrad thermisch	46 %
Volllaststunden	3.942 h/a (45% Bemessungsleistung)
Brennstoffart	Mischsubstrat (80 % Rindergülle, 20% Maissilage), frischmassebezogen (FM)
Brennstoffkosten	40,00 €/t_{FM} für Maissilage, 0 €/t_{FM} für Rindergülle
Strombezugskosten	18,0 ct/kWh_{el}
Eigenstrombedarf	8 %
Eigenwärmebedarf	60 % *(anteilig an der produzierten Brutto-Wärmemenge)*
Wärmeauskopplung	20 % *(extern genutzte Wärmemenge, bezogen auf die produzierte Brutto-Wärmemenge)*
Preissteigerung	Kapitalkosten: 1 %/a; alle anderen Kostenpositionen: 2 %/a
Anlegbare Wärmevergütung	2,0 ct/kWh_{th}

Kapitalkosten	
Eigenkapitalanteil	20 %
Fremdkapitalanteil	80 %
Eigenkapitalzins	8 %
Fremdkapitalzins	2 %
Kalkulatorischer Mischzinssatz i (nominal)	3,2 %
Spezifische Investitionen	10.389 €/kW_{el} Bemessungsleistung

Kapitalgebundene Kosten	9,85 ct/kWh_{el}
Verbrauchsgebundene Kosten	9,61 ct/kWh_{el}
Betriebsgebundene Kosten	6,94 ct/kWh_{el}
Sonstige Kosten	1,81 ct/kWh_{el}
Summe Kosten *(Stromgestehungskosten ohne Wärmegutschriften)*	28,21 ct/kWh_{el}
Erlöse Wärmeverkauf	0,53 ct/kWh_{el}
mittlere Stromgestehungskosten wärmebereinigt *(Stromgestehungskosten inkl. Wärmegutschriften)*	27,68 ct/kWh_{el}

Vergütung	
Max. anlegbarer Wert Bestands-Biogasanlage	22,23 ct/kWh$_{el}$ *(§44 EEG 2021)*
Flexibilitätszuschlag	1,65 ct/kWhel; *65 €/kW für install. Leistung*
Zusatzerlöse aus Fahrplanoptimierung	0,5 ct/kWhel
Kleinanlagenbonus (<500 kW) für Bestandsanlagen bei Ausschreibung 2021-2025	-
Vergütung insgesamt	24,38 ct/kWh$_{el}$

2.6.2.3. Deep geothermal installations (§45 EEG 2021)

(137) Germany submits that the development of geothermal installations still has not taken off. There is currently one installation entering into operation every 1-2 years and the number of projects under development is decreasing. The reference value amounts to:

Reference value in ct/kWh	**25.20**

(138) This value is decreased by 0.5% annually, as of 2024. Once total installed capacity exceeds 120 MW for the first time, the annual decrease will be increased to 2%.

(139) Germany explained that, on average, only one installation is put into operation per year. It is therefore difficult to determine representative cost and Germany is indicating a range of cost. Germany also explained that, in past experience, realised costs were generally higher than assumed.

Stromgestehungskosten Geothermie	
Eingangsparameter	
Kapitalkosten	Durchschnittswerte bzw. Bandbreiten auf Basis einer modellbasierten Auswertung (3 Anlagen).
Inbetriebnahmejahr	2021
Kalkulatorische Nutzungsdauer	20 Jahre
El. Nennleistung	ca. 4,2 MW
Th. Nennleistung (bei Kraft-Wärme-Kopplung)	ca. 8,0 MW
Vollaststunden	5.243 h/a Stromproduktion, 2.470 h/a Wärmeproduktion
Eigenkapitalanteil	43 % (Durchschnittswert über den gesamten Betrachtungszeitraum, da schrittweiser Übergang von Eigenkapital zu Fremdkapital nach der Bohrungsphase)
Fremdkapital	57 % (Durchschnittswert, s.o.)
Eigenkapitalzins	15,1%
Fremdkapitalzins	4,9 %
Kalkulatorischer Mischzinssatz	9,3 %
Spezifische Investitionskosten	12.039 €/kW
Davon spez. Kraftwerkskosten	5.285 €/kW
Betriebsgebundene Kosten	Durchschnittswerte (auf Basis Bestandsprojekte)
Instandhaltung und Betriebsführung	1,28 Mio. €
Eigenstrombedarf	ca. 79 €/MWh
Zusatzeinnahmen aus Alternativprodukt Wärme	ca. 28 €/MWh
Versicherung, Verwaltung, Pacht, etc.	0,81 Mio.€
Inflation	2%
Bandbreite Stromerzeugungskosten	29 bis 31 ct/kWh (Bestandsprojekte) 25 bis 32 ct/kWh (aus Basis neu geplanter Projekte und einem reduzierten Mischzinssatz von 8%, d.h. 12,1% EK-Zins)
Vergütung EEG 2017	
Keine Vergütung, anzulegender Wert zur Ermittlung der Marktprämie	25,2 ct/kWh
Vergütungsdegression für Neuanlagen (jeweils zum 01. Januar, beginnend 2022)	2,0% / a

Quelle: Basisdaten aus dem wissenschaftlichen Endbericht, II b): Geothermie, Juni 2019, weitere Projektdaten aktueller laufender und geplanter Projekte

2.6.2.4. Onshore wind (§46 EEG 2021)

(140) For onshore wind installations below 750 kW (and pilot installations in general), the reference value amounts to the average of the highest awarded bids of the tenders for onshore wind installations held two years ago and is scaled in accordance with the reference yield model presented in section 2.6.1.1 above. The segment of onshore wind installations below 750 kW is negligible in Germany. Germany has provided data showing that LCOE are higher for installations below 1 MW than for higher capacities subject to tenders.

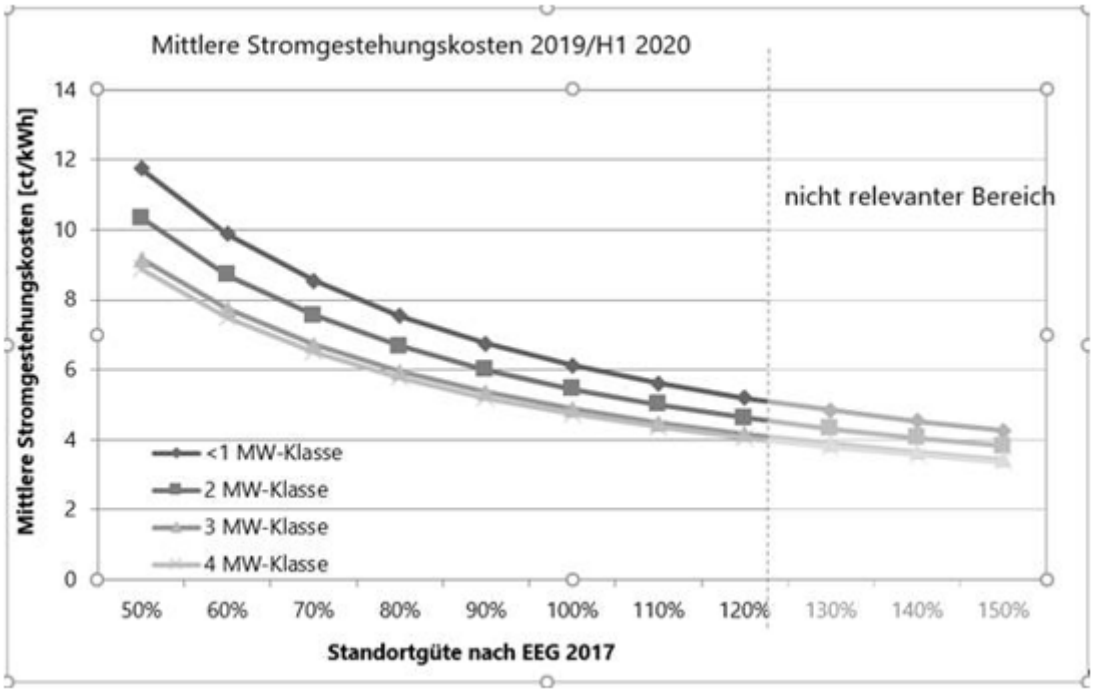


Figure 9: Average LCOE for onshore wind by size (2019/2020).

2.6.2.5. Solar PV (§48, 49 EEG 2021)

(141) For solar PV installations, the reference values have been updated in accordance with the EEG 2017 value which would have been valid for 1 January 2021 and now amount to:

	Rooftop PV			**Other PV**
Installation size in kW up to	10	40	750	750
Reference value in ct/kWh	8.56	8.33	6.62	6.01

(142) As a general rule, these values are decreased by 0.4% per month. The reference values and their modification are adjusted on a quarterly basis, depending on the over- or underachievement of a gross solar PV expansion path for installations with administratively set reference values between 2100 and 2500 MW annually on the basis of an extrapolated three-month period (as of 2023 adjusted for the awarded capacities in the rooftop PV tenders; so-called '*atmender Deckel*').

(143) Administratively set support for installations between 300 and 750 kW are remunerated only for the electricity production related to 50% of their capacity, as set out in recital (19) above.

(144) LCOE are presented in a range of 7% of the average, to cover the disparities between projects.

Stromerzeugungskosten für Photovoltaik Dachanlagen § 48 EEG 2021	
Eingangsparameter	
Inbetriebnahmejahr	2021 (Januar)
Kalkulatorische Nutzungsdauer	20 Jahre
Nennleistung	**5 kW, mit intelligentem Messsystem**
Technologie	Dachmontage, kristalline Module
Spezifischer Jahresertrag	930 kWh/kW (1. Jahr), 0,4 % Ertragsminderung p.a.
Kapitalkosten	
Eigenkapitalanteil	50 %
Eigenkapitalzins	5,0 %
Fremdkapitalanteil	50 %
Fremdkapitalzins	2,8 %
Kalkulatorischer Mischzinssatz	3,9 %
Spezifische Investition	1.300 €/kW (PV-Anlage) + 600 € (iMSys)
Gesamtinvestition	7.100 €
Betriebskosten	17 Euro pro kW und Jahr + 50 Euro pro Jahr (iMSys)
Inflation	1,5 %/a
Stromerzeugungskosten (±7 %)	14,8 (13,7 – 15,8) ct/kWh
Vergütung gemäß Gesetz für den Ausbau erneuerbarer Energien	8,27 ct/kWh Annahmen: keine Direktvermarktung. Die Differenz zwischen mittleren Stromerzeugungskosten und Vergütungssatz können die Anlagenbetreiber über Eigenverbrauch kompensieren (ein Teil der produzierten Strommenge ersetzt die Strombezugskosten, die höher als die Vergütung sind).
Vergütungsdegression für Neuanlagen	Vierteljährliche Anpassung in Abhängigkeit vom Zubau
Quelle: EEG-Vorhaben, sowie laufende Aktualisierungen der Kostenberechnung	

Stromerzeugungskosten für Photovoltaik Dachanlagen § 48 EEG 2021	
Eingangsparameter	
Inbetriebnahmejahr	2021 (Januar)
Kalkulatorische Nutzungsdauer	20 Jahre
Nennleistung	**30 kW, mit intelligentem Messsystem**
Technologie	Dachmontage, kristalline Module
Spezifischer Jahresertrag	900 kWh/kW (1. Jahr), 0,4 % Ertragsminderung p.a.
Kapitalkosten	
Eigenkapitalanteil	35 %
Eigenkapitalzins	7,0 %
Fremdkapitalanteil	65 %
Fremdkapitalzins	2,8 %
Kalkulatorischer Mischzinssatz	4,3 %
Spezifische Investition	1.010 €/kW (PV-Anlage) + 600 € (iMSys)
Gesamtinvestition	30.900 €
Betriebskosten	17 Euro pro kW und Jahr + 109 Euro pro Jahr (iMSys)
Inflation	1,5 %/a
Stromerzeugungskosten (±7 %)	11,5 (10,7 – 12,3) ct/kWh
Vergütung gemäß Gesetz für den Ausbau erneuerbarer Energien	8,12 ct/kWh Annahmen: keine Direktvermarktung. Die Differenz zwischen mittleren Stromerzeugungskosten und Vergütungssatz können die Anlagenbetreiber über Eigenverbrauch kompensieren (ein Teil der produzierten Strommenge ersetzt die Strombezugskosten, die höher als die Vergütung sind).
Vergütungsdegression für Neuanlagen	Vierteljährliche Anpassung in Abhängigkeit vom Zubau
Quelle: EEG-Vorhaben, sowie laufende Aktualisierungen der Kostenberechnung	

Stromerzeugungskosten für Photovoltaik Dachanlagen § 48 EEG 2021	
Eingangsparameter	
Inbetriebnahmejahr	2021 (Januar)
Kalkulatorische Nutzungsdauer	20 Jahre
Nennleistung	**100 kW, mit intelligentem Messsystem**
Technologie	Dachmontage, kristalline Module
Spezifischer Jahresertrag	900 kWh/kW (1. Jahr), 0,4 % Ertragsminderung p.a.
Kapitalkosten	
Eigenkapitalanteil	25 %
Eigenkapitalzins	8,0 %
Fremdkapitalanteil	75 %
Fremdkapitalzins	2,8 %
Kalkulatorischer Mischzinssatz	4,1 %
Spezifische Investition	890 €/kW (PV-Anlage) + 600 € (iMSys)
Gesamtinvestition	89.600 €
Betriebskosten	17 Euro pro kW und Jahr + 168 Euro pro Jahr (iMSys)
Inflation	1,5 %/a
Stromerzeugungskosten (±7 %)	10,0 (9,3 – 10,7) ct/kWh
Vergütung gemäß Gesetz für den Ausbau erneuerbarer Energien	7,02 ct/kWh Annahmen: keine Direktvermarktung. Die Differenz zwischen mittleren Stromerzeugungskosten und Vergütungssatz können die Anlagenbetreiber über Eigenverbrauch kompensieren (ein Teil der produzierten Strommenge ersetzt die Strombezugskosten, die höher als die Vergütung sind).
Vergütungsdegression für Neuanlagen	Vierteljährliche Anpassung in Abhängigkeit vom Zubau
Quelle: EEG-Vorhaben, sowie laufende Aktualisierungen der Kostenberechnung	

Stromerzeugungskosten für Photovoltaik Dachanlagen § 48 EEG 2021	
Eingangsparameter	
Inbetriebnahmejahr	2021 (Januar)
Kalkulatorische Nutzungsdauer	20 Jahre
Nennleistung	**250 kW**
Technologie	Dachmontage, kristalline Module
Spezifischer Jahresertrag	900 kWh/kW (1. Jahr), 0,4 % Ertragsminderung p.a.
Kapitalkosten	
Eigenkapitalanteil	25 %
Eigenkapitalzins	8,0 %
Fremdkapitalanteil	75 %
Fremdkapitalzins	2,8 %
Kalkulatorischer Mischzinssatz	4,1 %
Spezifische Investition	820 €/kW
Gesamtinvestition	205.000 €
Betriebskosten	17 Euro pro kW und Jahr
Inflation	1,5 %/a
Stromerzeugungskosten (±7 %)	9,5 (8,8 – 10,2) ct/kWh
Vergütung gemäß Gesetz für den Ausbau erneuerbarer Energien	6,99 ct/kWh Annahmen: Direktvermarktung. Die Differenz zwischen mittleren Stromerzeugungskosten und Vergütungssatz können die Anlagenbetreiber über Eigenverbrauch kompensieren (ein Teil der produzierten Strommenge ersetzt die Strombezugskosten, die höher als die Vergütung sind).
Vergütungsdegression für Neuanlagen	Vierteljährliche Anpassung in Abhängigkeit vom Zubau
Quelle: EEG-Vorhaben, sowie laufende Aktualisierungen der Kostenberechnung	

Stromerzeugungskosten für Photovoltaik Dachanlagen § 48 EEG 2021	
Eingangsparameter	
Inbetriebnahmejahr	2021 (Januar)
Kalkulatorische Nutzungsdauer	20 Jahre
Nennleistung	**500 kW**
Technologie	Dachmontage, kristalline Module
Spezifischer Jahresertrag	900 kWh/kW (1. Jahr), 0,4 % Ertragsminderung p.a.
Kapitalkosten	
Eigenkapitalanteil	25 %
Eigenkapitalzins	8,0 %
Fremdkapitalanteil	75 %
Fremdkapitalzins	2,8 %
Kalkulatorischer Mischzinssatz	4,1 %
Spezifische Investition	770 €/kW
Gesamtinvestition	385.000 €
Betriebskosten	17 Euro pro kW und Jahr
Inflation	1,5 %/a
Stromerzeugungskosten (±7 %)	9,0 (8,4 – 9,6) ct/kWh
Vergütung gemäß Gesetz für den Ausbau erneuerbarer Energien	6,84 ct/kWh Annahmen: Direktvermarktung. Die Differenz zwischen mittleren Stromerzeugungskosten und Vergütungssatz können die Anlagenbetreiber über Eigenverbrauch kompensieren (ein Teil der produzierten Strommenge ersetzt die Strombezugskosten, die höher als die Vergütung sind).
Vergütungsdegression für Neuanlagen	Vierteljährliche Anpassung in Abhängigkeit vom Zubau
Quelle: EEG-Vorhaben, sowie laufende Aktualisierungen der Kostenberechnung	

Stromerzeugungskosten für Photovoltaik Freiflächenanlagen § 48 EEG 2021	
Eingangsparameter	
Inbetriebnahmejahr	2021 (Januar)
Kalkulatorische Nutzungsdauer	20 Jahre
Nennleistung	**750 kW**
Technologie	Ebenerdige Montage, kristalline Module (Freiflächenanlage
Spezifischer Jahresertrag	950 kWh/kW (1. Jahr), 0,4 % Ertragsminderung p.a.
Kapitalkosten	
Eigenkapitalanteil	25 %
Eigenkapitalzins	8,0 %
Fremdkapitalanteil	75 %
Fremdkapitalzins	2,8 %
Kalkulatorischer Mischzinssatz	4,1 %
Spezifische Investition	700 €/kW
Gesamtinvestition	525.000 €
Betriebskosten	15 Euro pro kW und Jahr
Inflation	1,5 %/a
Stromerzeugungskosten (±7 %)	7,7 (7,1 – 8,2) ct/kWh
Vergütung gemäß Gesetz für den Ausbau erneuerbarer Energien	6,08 ct/kWh Annahmen: Direktvermarktung. Die Differenz zwischen mittleren Stromerzeugungskosten und Vergütungssatz können die Anlagenbetreiber über Eigenverbrauch kompensieren (ein Teil der produzierten Strommenge ersetzt die Strombezugskosten, die höher als die Vergütung sind).
Vergütungsdegression für Neuanlagen	Vierteljährliche Anpassung in Abhängigkeit vom Zubau
Quelle: EEG-Vorhaben, sowie laufende Aktualisierungen der Kostenberechnung	

2.6.2.6. *Mieterstrom* (solar tenant electricity)

(145) In the past, Germany also had a separate system for paying support for tenant electricity (SA.48327) installations up to a size of 100 kW on residential buildings.

(146) The measure aims at supporting landlords willing to install solar panels on the roof of the building that they rent out fully or partially. The objective of this measure is to promote the consumption of PV electricity directly within the building in situations where property is rented and the electricity therefore not consumed by the owner of the building/PV installation (and therefore not self-consumption). The landlord invests in the PV installation and makes its production available to its tenants.

(147) This support is available for the supply of electricity not circulating through a public grid to a final consumer in the same building or in connected building complexes, which give the impression of a connected unit.

(148) Germany has observed that while PV panels of less than 10 kW continue to be installed (e.g. in single family houses), the segment of solar panels between 10 kW and 100 kW (i.e. the type of PV installations that would typically be installed on rented apartment buildings) is stagnating, even though the potential on rented buildings is largely untapped. Germany explained that economic conditions are such that, without support, landlords will not install solar installations on rented buildings to supply electricity to their tenants because such investment would either be loss-making or yield such a poor return that the investment is not worth the administrative and organisational burden. Also, the support levels available under the EEG 2021 for PV for electricity injected into the grid have been structured based on the assumption that part of the installation can be used for the self-supply of the owner of the installation, as this increases the attractiveness of the investment. In contrast, solar installations on rented buildings are not used for self-supply (by definition). However, without the possibility to self-consume part of the electricity consumed, the support levels offered in the EEG for electricity injected into the grid do not allow for a sufficient rate of return for investors, which explains the stagnation in the segment of solar panels that can be installed on rented buildings.

(149) In the EEG 2021, following recommendations from a report assessing the functioning of the tenant electricity measure in the past, Germany delinks the rates for solar PV and solar tenant electricity and establishes separate reference values for tenant electricity, as this avoids certain unintended consequences of the past linkage of both systems, which has been identified as one of the reasons blocking the take-off of tenant electricity. The reference values for tenant electricity amount to:

Installation size in kW up to	**10**	**40**	**100**[19]
Reference value in ct/kWh	3.79	3.52	2.37

(150) These values decrease monthly on the same conditions and by the same percentages as the administratively set reference values for solar PV installations in general.

(151) In accordance with the information provided in case SA.48327, Germany has submitted estimated rates of return for a number of scenarios and sizes of tenant electricity projects, which are summarised in the following table:

[19] According to §48a of the EEG 2021, the reference value is applicable up to 500 kW. However, only installations up to 100 kW are supported.

Zahl der Wohnungen	PV-Anlage [kW]	Teilnehmer-quote	Anteil PV-Direktverbrauch vor Ort	Projektverzinsung (interner Zinsfuß, real, vor Steuern)	
				Niedrige Kosten	Hohe Kosten
6	20	50%	34%	4,6%	3,6%
6	20	70%	34%	4,3%	2,8%
6	20	90%	34%	4,0%	2,0%
10	20	50%	49%	6,8%	5,2%
10	20	70%	49%	6,3%	4,0%
10	20	90%	49%	5,8%	2,8%
12	40	50%	34%	5,5%	4,4%
12	40	70%	34%	5,2%	3,6%
12	40	90%	34%	4,8%	2,8%
20	40	50%	49%	7,8%	6,1%
20	40	70%	49%	7,2%	4,8%
20	40	90%	49%	6,7%	3,5%
18	60	50%	34%	5,6%	4,4%
18	60	70%	34%	5,3%	3,6%
18	60	90%	34%	4,9%	2,7%
30	60	50%	49%	8,0%	6,2%
30	60	70%	49%	7,5%	4,9%
30	60	90%	49%	6,9%	3,6%
24	80	50%	34%	5,6%	4,4%
24	80	70%	34%	5,3%	3,6%
24	80	90%	34%	4,9%	2,7%
40	80	50%	49%	8,1%	6,3%
40	80	70%	49%	7,5%	5,0%
40	80	90%	49%	7,0%	3,6%
30	100	50%	34%	5,7%	4,5%
30	100	70%	34%	5,4%	3,6%
30	100	90%	34%	5,0%	2,7%
50	100	50%	49%	8,3%	6,4%
50	100	70%	49%	7,7%	5,1%
50	100	90%	49%	7,1%	3,7%

Table 6: Rates of return for a number of tenant electricity scenarios and sizes.

2.6.2.7. Hydropower installations (§ 40 EEG 2021)

(152) For hydropower installations, under the EEG 2021, support is granted to new installations as well as to existing installations when they extend their capacity. For existing installations with installed capacity of more than 5 MW, the support is limited to the capacity extension.

(153) Germany has submitted that the potential for the installation of new hydropower installations or the modernisation of existing installations is extremely limited, but that these installations are useful as a complement to intermittent RES sources. In particular in the category above 1 MW, there is only a small number of investments each year. There is no reason to expect an increase in numbers in the next years. Germany therefore submits that tenders should not be applied to this technology.

Neubau	Anzahl	Leistung [MW]	davon Anlagen > 1MW	
			Anzahl	MW
2017	69	7,21	1	1,04
2018	55	5,69	1	1,77
2019	69	12,13	3	6,27
2020	56	11,65	2	3,38
modernisierte Bestandsanlagen	**Anzahl**	**Leistungserhöhung (MW)**		
2017	28	0,45	1	0,16
2018	22	0,58	1	0,15
2019	68	3,06	8	2,02
2020	29	0,89	2	0,43

Table 7: Number of hydropower installations per year by size.

(154) The reference values have been updated in accordance with the EEG 2017 and now amount to:

Rated capacity in MW up to and including	**0.5**	**2**	**5**	**10**	**20**	**50**	**larger**
Reference value in ct/kWh	12.15	8.01	6.13	5.37	5.18	4.16	3.40

(155) These values are decreased annually by 0.5% per year.

Stromerzeugungskosten der Wasserkraft (Neubau) § 40 EEG	
Eingangsparameter	
Inbetriebnahmejahr	2020
Kalkulatorische Nutzungsdauer	20 Jahre
Lebensdauer der Anlage baulicher Teil (70%)	60 Jahre
Lebensdauer der Anlage maschineller Teil (30%)	30 Jahre
Nennleistung	2,0 MW
Bemessungsleistung	959 kW
Vollaststunden	4.200 h/a
Kapitalkosten	
Eigenkapitalanteil	30%
Fremdkapitalanteil	70%
Eigenkapitalzins	5,0%
Fremdkapitalzins	3,3%
Kalkulatorischer Mischzinssatz	3,8%
Spezifische Gesamtinvestition [€/kW]	5.000
Betriebsgebundene Kosten	
Betrieb und Instandhaltung	3,2% der Investitionssumme pro Jahr
Inflation	1%/a
Mittlere Stromerzeugungskosten	10,44 ct/kWh
Vergütung (EEG 2021)	
Keine Vergütung, anzulegender Wert zur Ermittlung der Marktprämie	10,22 ct/kWh*
Vergütungsdegression für Neuanlagen (jeweils zum 01.Januar, beginnend 2016)	0,5%/a

* berücksichtigt man den durchschnittlichen vermiedenen Strombezug liegt die Vergütung bei 10,32 ct/kWh

Stromerzeugungskosten der Wasserkraft (Modernisierung) § 40 EEG	
Eingangsparameter	
Inbetriebnahmejahr	2020
Kalkulatorische Nutzungsdauer	20 Jahre
Lebensdauer der Anlage	40 Jahre
Nennleistung	2,0 MW
Bemessungsleistung	959 kW
Vollaststunden	4.200 h/a
Kapitalkosten	
Eigenkapitalanteil	30%
Fremdkapitalanteil	70%
Eigenkapitalzins	5,0%
Fremdkapitalzins	3,3%
Kalkulatorischer Mischzinssatz	3,8%
Spezifische Gesamtinvestition [€/kW]	2.000
Betriebsgebundene Kosten	
Betrieb und Instandhaltung	1,6% der Investitionssumme pro Jahr
Inflation	1%/a
Mittlere Stromerzeugungskosten	10,63 ct/kWh
Vergütung (EEG 2020)	
Keine Vergütung, anzulegender Wert zur Ermittlung der Marktprämie	10,22 ct/kWh *
Vergütungsdegression für Neuanlagen (jeweils zum 01.Januar, beginnend 2016)	0,5%/a

* berücksichtigt man den durchschnittlichen vermiedenen Strombezug liegt die Vergütung bei 10,32 ct/

(156) Germany has also provided LCOE as a function of installed capacity:

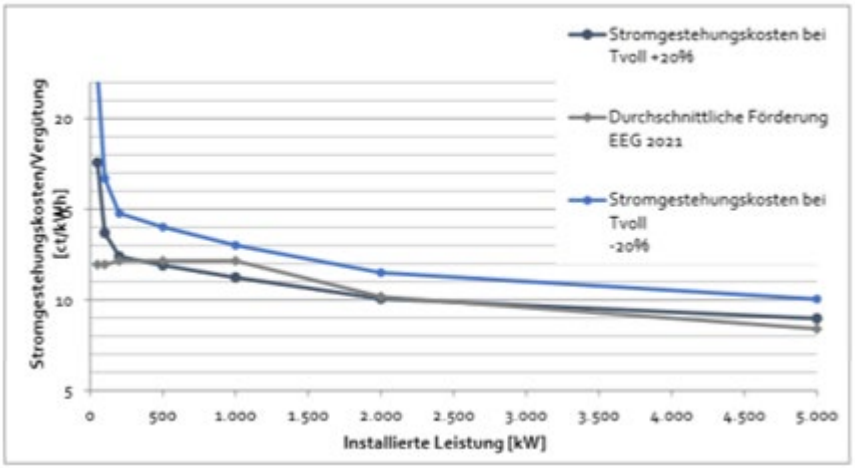


Figure 10: LCOE ranges of modernised hydropower installations of various sizes.

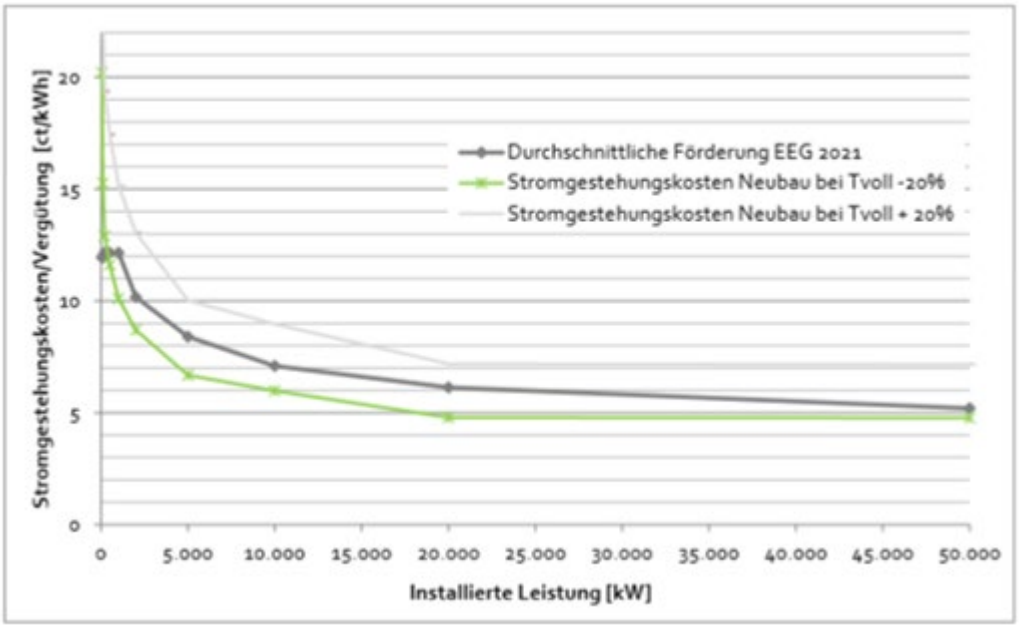


Figure 11: LCOE ranges of new hydropower installations of various sizes.

2.7. Cumulation

(157) Cumulation between aid under the EEG 2021 and investment aid is possible. However, the cumulation of the EEG aid, investment aid and revenues from the sale of the electricity may not exceed the production costs of the energy concerned (§80a EEG 2021, unchanged from EEG 2017).

(158) If cumulation occurs between administratively set tariffs or premiums and investment aid, Germany has indicated that it would first examine what the maximum permissible aid intensity is for investment aid. Secondly, it would identify the (potential) subsidy gap ('*Förderlücke*'), i.e. the difference between EEG support and electricity production costs. The potential subsidy gap will as a rule be based on the LCOE of standardised installations and on the individual LCOE when the installation is too different from the reference model. The potential subsidy gap can be calculated as a value per kWh or as a total amount over the entire lifetime. Thirdly, the possible investment aid would then be paid out only to the extent that it does not exceed either the potential subsidy gap or the allowed aid intensities for investment aid.

(159) Germany has further indicated that when the beneficiary has been selected in a tender, cumulation with investment aid is in principle not possible given that the aid obtained in the tender is covering the entire LCOE (including a reasonable return). However, Germany has submitted that an investment aid would be justified in addition to the aid under the EEG (even though obtained after a tender) when this investment aid is to cover investment costs unrelated to electricity production and which are separate from the costs that were part of the scope of the tender. Any investment aid that would distort the tender results will be excluded, however.

2.8. Monitoring of costs

(160) The German authorities have committed to annually verify the production costs of typical installations as part of the domestic technology-specific monitoring reports ('*Forschungsvorhaben*') and compare them with the remuneration levels.

(161) The German authorities observe that if overcompensation occurs, measures will be taken to review the remuneration awarded in the future to such installations in order to avoid any overcompensation in line with paragraph 131 of the EEAG (i.e. the aid per unit of energy should not exceed the difference between the cost of producing the energy (LCOE) and its market price).

2.9. Duration of Support

(162) Germany has notified the scheme for the period 1 January 2021 until 31 December 2026 in view of the evaluation (taking into account the suspensive clause under the EEG 2021 as mentioned in recitals (8)).

2.10. Budget

(163) Germany provided official TSO data that the annual payments for the support to RES installations amounted to EUR 25.5 billion for 2019 (of which EUR 3.7 billion was for offshore wind[20]). Germany estimates that the annual payments will amount to EUR 33.1 billion for 2021 (of which EUR 4.6 billion will be for offshore wind) and then decrease over the coming years to EUR 24 billion for 2025 (of which EUR 3.4 billion will be for offshore wind).

(164) As regards the budget (i.e. discounted aid payments to EEG installations awarded in tenders or entering into operation between 2021 and 2026), Germany submits that this cannot be reliably estimated due to the uncertainty of the award level combined with the uncertainty of the future market price. It points to the fact that the capacity to be awarded and the bid caps, as well as reference values are known.

(165) For relevant purposes, as regards tenders the Commission therefore considers the volume in the form of capacity to be awarded laid down in the EEG 2021 as a proxy for the budget.

(166) The budget for the reduction of the EEG surcharge for EIUs is estimated to amount to around EUR 4.9 billion per year (for the recent year 2019).

(167) Germany submitted that for the reduction of the EEG surcharge for shore-side electricity, it is currently not possible to provide an estimate.

2.11. Financing

(168) The EEG financing has been described in detail in the decisions in cases SA.38632 (recitals 11 to 73) and SA.45461 (recitals 139 to 143) and remains similar with the exception of additional payments from the Federal Budget of Germany from the year 2021 on. This means:

[20] Support to offshore wind installations connected to the grid has been approved in case SA.57610 (2020/N).

(169) The financing of the remuneration for EEG electricity is based on the polluter-pays principle ('*Verursacherprinzip*', §2(4) EEG 2021). The financial burden will be shared among all electricity consumers on the basis of their electricity consumption through the EEG surcharge (see recital (174) below). In order not to endanger the international competitiveness of electricity-intensive industries and in order to maintain the intermodal competitiveness of maritime shipping and reduce emissions in seaports, the EEG 2021 foresees reductions from the EEG surcharge for energy-intensive users as well as for shore-side electricity respectively.

(170) Network operators (in most cases the Distribution System Operator, 'DSO') are obliged to pay the market premium to producers of EEG electricity established within their network area or to purchase the EEG electricity at feed-in tariffs.

(171) DSOs have to immediately transfer the EEG electricity to their respective TSO. TSOs are under the obligation to compensate the DSOs in their network area for payments for feed-in tariffs, market premiums and flexibility premiums that DSOs have paid to producers of EEG electricity.

(172) The EEG 2021 establishes further an equalisation mechanism whereby the financial burden is spread between TSOs so that ultimately every TSO covers the costs of a quantity of electricity that corresponds to the average share of EEG electricity compared to the total electricity delivered to the final consumers in each area served by the individual TSO in the previous calendar year.

(173) TSOs are obliged to sell the EEG electricity for which they paid feed-in tariffs on the spot market. They can do so alone or together.

(174) If the price obtained on the spot market is not sufficient to cover the financial burden, TSOs have the right and obligation to require from electricity suppliers to pay a share of the financial burden proportionate to the respective quantity of electricity delivered by the electricity suppliers to their final consumers (§60 EEG 2021). The share must be determined in such a way that each electricity supplier bears the same costs for each kWh of electricity delivered by it to a final consumer. The EEG 2021 explicitly designates that surcharge as '*EEG-Umlage*' ('EEG surcharge') (see §60 (1) EEG 2021).

(175) The EEG 2021 also sets the methodology to determine the level of the surcharge and sets the level of the surcharge directly for certain categories of consumers (see §64 EEG 2021 for electro-intensive undertakings for instance and §61b to §61g EEG 2021 for self-suppliers and consumers not supplied by an electricity supplier). The law further determines to what purposes the surcharge can be used and how any surpluses or deficits are corrected, as described in the *Verordnung zur Durchführung des Erneuerbare-Energien-Gesetzes und des Windenergie-auf-See-Gesetzes* (*Erneuerbare-Energien-Verordnung*, hereinafter 'EEV'). Indeed, according to §3 EEV, differences between forecasted revenues and expenses and actual revenues and expenses are taken into account for the determination of the surcharge for the next year X+1. As a result, deficits (including the interest rate) are compensated in year X+1 and surpluses are used to reduce the surcharge of the coming year. They may not be retained by the TSOs and therefore do not influence their financial means. The methodologies and elements that TSOs have to take into account when determining the EEG surcharge are further detailed in

the *Verordnung zur Ausführung der Erneuerbare-Energien-Verordnung* ('EEAV').

(176) As a result of these implementing provisions, the TSOs jointly determine each year the EEG surcharge for year X+1 on the basis of the forecasted financial needs for the financial burden, the forecasted revenues from the sale of the EEG electricity on the spot market and the forecasted consumption of electricity. In addition, a series of revenues and costs linked to the management of the EEG surcharge have to be taken into account for its calculation. Finally, they also take into account payments from the Federal budget to the EEG account.

(177) TSOs also have the right and the obligation to require the payment of the EEG surcharge from producers of electricity using the electricity produced by installations operated by them for their own consumption ('auto-supply': '*Eigenversorgung*') as well as from other end consumers that are not supplied by an electricity supplier (§61 EEG 2021). The rules of the EEG 2021 applicable to electricity suppliers are applicable *mutatis mutandis* to auto-suppliers.

(178) The EEG 2021 does not explicitly impose on electricity suppliers the obligation to pass on the EEG surcharge to final customers. However, when the final consumer is an electro-intensive company eligible for reduced EEG surcharges under the BesAR[21], the TSO has the right and obligation to request the payment of the EEG surcharge directly from this consumer rather than through the electricity supplier (§60a EEG 2021).

(179) EEG electricity operators, DSOs and TSOs, electricity suppliers, auto-suppliers and final consumers who are supplied with electricity from other parties than electricity suppliers are obliged to make available to each other the data required for the correct implementation of the EEG system (§70 EEG 2021). The EEG 2021 establishes exactly what type of information must be transmitted systematically to other operators and at what time of the year (§§71-74 EEG 2021).

(180) TSOs have to keep all transactions linked to the EEG separate from the rest of their activities. They are obliged to keep separate bookkeeping for all financial flows related to the EEG, and the expenses and revenues linked to the EEG must be made on a separate account (§5 EEAV).

(181) The BNetzA has been entrusted with various tasks. Network operators have to transmit to the BNetzA the details which they receive from the installation operators (installation location, production capacity, etc.), the network level at which installations are connected, aggregated and individual tariffs paid to installations, the final invoices sent to electricity suppliers and the data required to verify the accuracy of the figures thus provided. Electricity suppliers are obliged to communicate to the BNetzA the amount of electricity supplied to their customers and their final accounts. The BNetzA also organises and carries out the tenders. The BNetzA itself is subject to certain reporting obligations and has to communicate certain data to the Ministry for Economy and Energy for statistical and evaluation purposes.

[21] BesAR stands for „Besondere Ausgleichsregelung" or „Special Equalisation Scheme" under the EEG.

(182) Those benefiting from a capped EEG surcharge based on §§63-68 EEG 2021 (EIUs, shore-side electricity and others) must, upon request, provide the Federal Ministry for Economic Affairs and Energy and the BAFA[22] with information about all the facts which are necessary in order to evaluate §§63-68 EEG 2021.

(183) Moreover, from the year 2021 on, a possibility has been created to use financial means from the Federal budget, including from income derived from the national CO_2 pricing. This measure has been put into effect by defining a new source of revenue for the EEG account, which are direct payments from the Federal budget to the EEG account in order to reduce the EEG surcharge (§ 3(3)3a EEV).

(184) For the years 2021 and 2022, the German government has decided specifically to limit the EEG surcharge in 2021 to 6.5 cents/kWh and to 6.0 cents/kWh in 2022. This is confirmed in a binding manner, such that the TSOs take it into account, when determining the EEG surcharge on 15 October. Germany has therefore already decided to pay EUR 10.8 billion from the Federal budget into the EEG account for 2021.

(185) It is also foreseen to lower the EEG surcharge in the following years using financial means from the Federal budget, the act on which is usually passed close to the end of the year. It is at the discretion of the German Parliament to authorize such funds in future budget acts. According to the EEV, the TSOs take into account the foreseen payments into the EEG account from the government draft of the budget act, which is available before 15 October, date when the TSOs set the EEG surcharge for the next year.

(186) The payment schedule has been agreed in a contract between Germany and the four TSOs based on § 3(9) EEV[23].

2.12. EEG surcharge reductions

2.12.1. EEG surcharge reductions for energy-intensive users

(187) The EEG 2021 limits the amount of the surcharge that can be recovered from energy-intensive users ('EIU'), if they submit a request to the BAFA to benefit from a reduced EEG surcharge[24].

(188) The limitation aims at reducing the electricity costs for EIUs, in order to maintain their international competitiveness, insofar as this is compatible with the goals of the EEG and the reduced surcharge is compatible with the interest of the electricity users as a whole.

i. Eligibility

(189) Undertakings[25] belonging to one of the sectors listed in Annex 4 of the EEG 2021 can benefit from the reduced EEG surcharge. Annex 4 contains two lists of

22 Bundesamt für Wirtschaft und Ausfuhrkontrolle.

23 https://www.bmwi.de/Redaktion/DE/Downloads/Energie/eeg-umlage-vertrag-uebertragungsnetzbetreiber.pdf?__blob=publicationFile&v=6

24 §63 in combination with §64 and §64a of the EEG 2021. Germany did not notify §64 (8) of the EEG 2021 related to green hydrogen, which, therefore, falls outside the scope of this decision.

25 Or independent parts of undertakings as defined in §64 (5) of the EEG 2021.

sectors. List 1 corresponds to Annex 3 of the EEAG and list 2 includes the sectors listed in Annex 5 of the EEAG. In addition, list 2 includes the sectors 'forging, pressing, stamping and roll-forming of metal; powder metallurgy'[26] and 'treatment and coating of metals'[27]. Germany has submitted data regarding the latter two sectors showing that both had a trade intensity at European level of 37.9% in 2018[28].

(190) To be eligible for the reduced EEG surcharge energy-intensive users have to show that they consumed at least 1 GWh of electricity subject to the surcharge in the last financial year at the consumption point concerned. In addition, they need to fulfil the following criteria:

- the electro-intensity of the undertaking must at least be:
  - 14% in 2021, 13% in 2022, 12% in 2023 and 11 % as of 2024 for undertakings of list 1 of Annex 4 to the EEG 2021;
  - 20% for undertakings of list 2 of Annex 4 to the EEG 2021.
- the undertaking must have a certified energy or environmental management system in place. If it consumes less than 5 GWh, it can use an alternative system to improve its energy-efficiency.

ii. Level of reductions

(191) Whilst EIUs have to pay the full EEG surcharge on the first GWh they consume, they only pay 15% of the EEG surcharge on the remainder of the electricity they use.

(192) In addition, there is a cap on the reduced EEG surcharge, which ensures that the EIUs do not pay more than the following percentages of the arithmetic mean of the gross added value ('GVA') of the undertaking over the last 3 years:

- 0.5% of the GVA for undertakings with an electro-intensity of at least 20%;
- 4% of the GVA for undertakings with an electro-intensity below 20%.

(193) Nevertheless, despite the GVA cap described above, the reduction of the EEG surcharge may not result in a surcharge below 0.1 ct/kWh on the electricity above 1 GWh. For the sectors 'aluminium production', 'lead, zinc and tin production' as well as 'copper production'[29], the reduction may not result in a surcharge lower than 0.05ct/kWh for the electricity above 1 GWh. Germany has indicated that the latter three sectors are treated differently because they are price takers on commodities markets and are not in a position to pass on any additional costs to their customers.

(194) Departing from the provisions above, special provisions are foreseen for undertakings belonging to the sector 'manufacture of industrial gases'[30] in which the production of hydrogen contributes to the majority of their total value added

[26] NACE code 2550.
[27] NACE code 2561.
[28] https://ec.europa.eu/clima/sites/default/files/events/docs/0127/6_cll-ei-ti_results_en.pdf.
[29] NACE codes 2442, 2443 and 2444.
[30] Number 78 in Annex 4 of the EEG 2021 and equivalent to NACE code 2011 listed in Annex 3 of the EEAG.

irrespective of the purpose of use of the hydrogen[31]. They will pay 15% of the EEG surcharge as of the first GWh consumed. As is the case for other EIUs, they will not pay more than 0.5% of the GVA over the last 3 years if they have an electro-intensity of at least 20% and the surcharge will not amount to less than 0.1 cent per kWh[32].

(195) Germany explained that the special treatment of undertakings producing hydrogen aims at the market ramp-up of the technology. Contrary to other established markets in the industrial gases sector, there are currently no dedicated industrial production facilities for the electrolytic production of hydrogen. The possibility of obtaining a reduction on the EEG surcharge from the first GWh aims at encouraging the potential development of the uptake of the technology also by smaller actors.

iii. Technical provisions

(196) The GVA is established at factor costs, without deducting costs for outsourced personnel[33].

(197) Electro-intensity is defined as the ratio between the electricity costs and the arithmetic mean of the GVA over the last three full accounting years. The relevant electricity costs include the electricity costs for own consumption that are subject to the EEG surcharge in accordance with §61 EEG 2021. If an undertaking does not reach the required electro-intensity to benefit from the reduced EEG-surcharge due to electricity it consumes which is in principle not subject to the surcharge, it can add these electricity volumes to reach the energy-intensity level, if it subsequently pays the reduced EEG surcharge on them.

(198) The relevant electricity costs correspond to the undertaking's assumed electricity consumption multiplied by the assumed electricity price. The assumed electricity consumption corresponds to the arithmetic mean over the last 3 closed accounting years or based on consumption efficiency benchmarks to be established by the Ministry of Economic Affairs and Energy in accordance with §94 (1) EEG 2021. The assumed electricity price corresponds to the average retail electricity price applying to undertakings with a similar level of electricity consumption to be established by the Ministry of Economic Affairs and Energy in accordance §94 (2) of the EEG 2021 (the latter is currently defined by the *Besondere-Ausgleichsregelung-Durchschnittsstrompreis-Verordnung* (DSPV)) [34].

(199) For new undertakings established after 30 June of the preceding year, data for part of the first year can be used. For the second year, data relating to the first full year in operation will be used and for the third year data relating to the first two years of operation will be used. After the first full year, an ex-post assessment of the eligibility criteria will take place[35].

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31 § 64a of the EEG 2021.

32 Germany also foresees that these provisions apply to non-independent parts of undertakings in § 64a (6) of the EEG 2021. This was not notified to the Commission and falls outside of the scope of this decision. The current decision does not, therefore, take any position on potential reductions from the EEG-surcharge for non-independent parts of undertakings.

33 § 64 (6) point 2 of the EEG 2021.

34 § 64 (6) point 3 of the EEG 2021.

35 § 64 (4) of the EEG 2021.

iv. Transitory provisions

(200) For undertakings that were entitled to a limited EEG surcharge in 2014 on the basis of a valid BAFA decision and belonging to one of the two categories below, the surcharge is capped at 20% of the EEG surcharge for their electricity consumption above 1 GWh, if their electro-intensity reaches 14%[36]:

- The undertakings do not belong to any sector listed in Annex 4 to the EEG 2021;
- The undertakings belong to list 2 of Annex 4 to the EEG 2021, but do not have an electro-intensity of at least 20%.

2.12.2. Shore-side supply of electricity to seagoing ships in harbour

(201) By amending § 63 EEG 2021 and introducing the new § 65b EEG 2021, an additional category of reductions of the EEG surcharge has been established. It applies to the purchase of 'shore-side electricity' by seagoing ships and aims to create incentives for the consumption of shore-side electricity by ships at berth to replace electricity produced from fossil fuels on board. Thereby, air quality in German ports and the surrounding areas/cities would be improved and CO_2 emissions reduced.

(202) Ships require considerable amounts of electricity during their berthing times in ports, which they usually generate themselves from their own auxiliary diesel engines or generators using other fossil fuels. The resulting exhaust gases pollute significantly the air quality in port cities. An alternative cleaner power supply for ships enables the shutdown of the ship's own generators during berthing times in ports.

(203) In this context, the German authorities provided the following examples demonstrating the annual CO_2 emissions (red) due to diesel generators and corresponding reductions (blue) due to the use of shore-side electricity.

(204) In order to provide representative figures, the German authorities explained that they aimed to cover as many different sizes and types of ships as possible, and consumers with different power requirements (small, medium, large), hence the divergent results.

[36] §103 (4) of the EEG 2021.

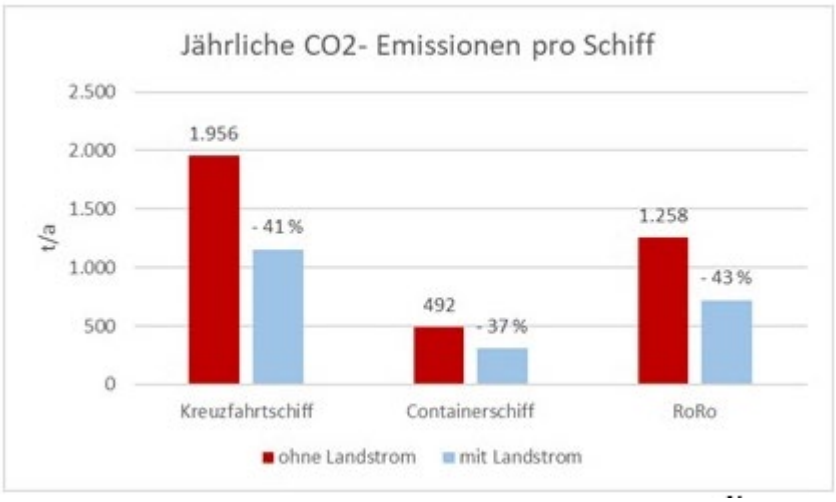

Figure 12: Estimated annual CO_2 emissions per ship type (source: German authorities[37])

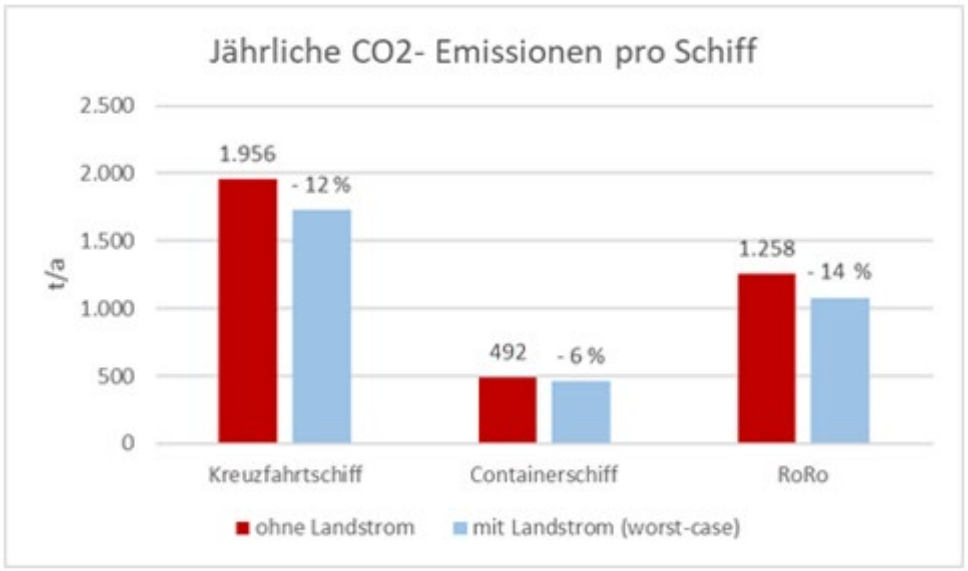

Figure 13: Estimated annual CO_2 emissions per ship type and comparison with emissions from electricity generation when electricity is not produced from renewables only (worst case scenario) (source: German authorities)

(205) In this regard, the German authorities stressed that by using cleaner electricity, the reduction of CO_2 emissions can be further improved, e.g., through an increased use of renewable electricity[38] or even additionally generated renewable electricity. Based on the Federal government's information, all existing shore-side power facilities in German seaports are currently powered exclusively by electricity generated 100% from renewable sources and intend to do so in the

[37] The German authorities explained that as CO_2 emissions do not have a local but global impact, the specific CO_2 emission data of the German grid electricity mix for 2019 according to the Federal Environment Agency (*Umweltbundesamt* - UBA (2020)) were used for the calculation.

[38] For more information on the development of renewable energies in Germany, see: https://www.erneuerbare-energien.de/EE/Navigation/DE/Service/Erneuerbare_Energien_in_Zahlen/Entwicklung/entwicklung-der-erneuerbaren-energien-in-deutschland.html.

future. This is based on the shipping companies' interest in renewable electricity (especially for a green image) and on a requirement under national subsidy law for funded (investment) shore-side electricity systems.

(206) With regard to local air pollutants (NOx, SOx and PM), the German authorities further explained that by using shore-side electricity, a 100% emission reduction in such pollutants can be expected compared to on-board electricity generation with diesel:

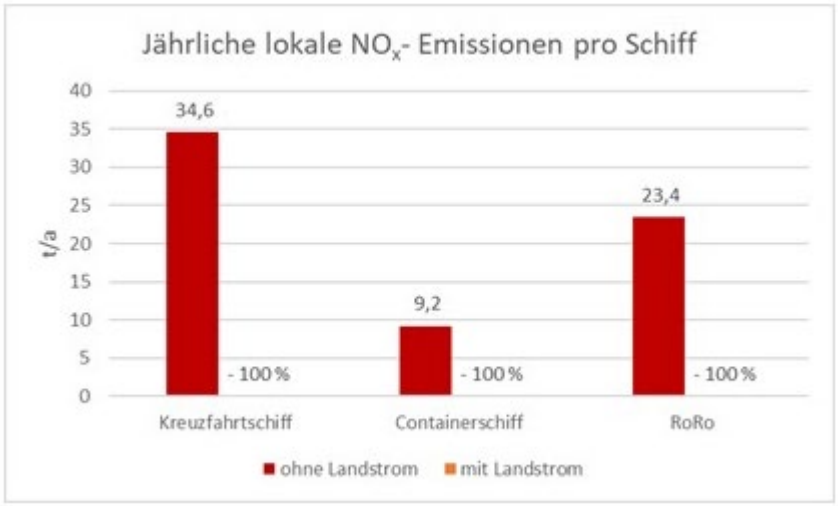

Figure 14: Estimated annual NOx emissions per ship type (source: German authorities)

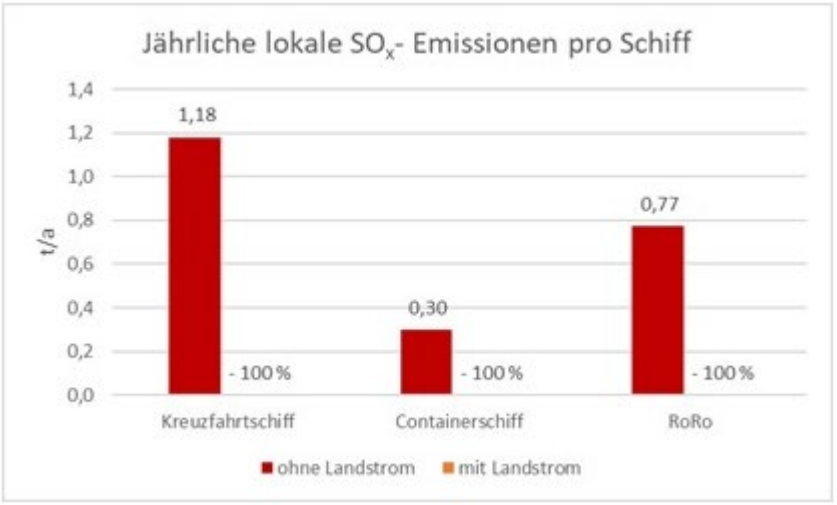

Figure 15: Estimated annual SOx emissions per ship type (source: German authorities)

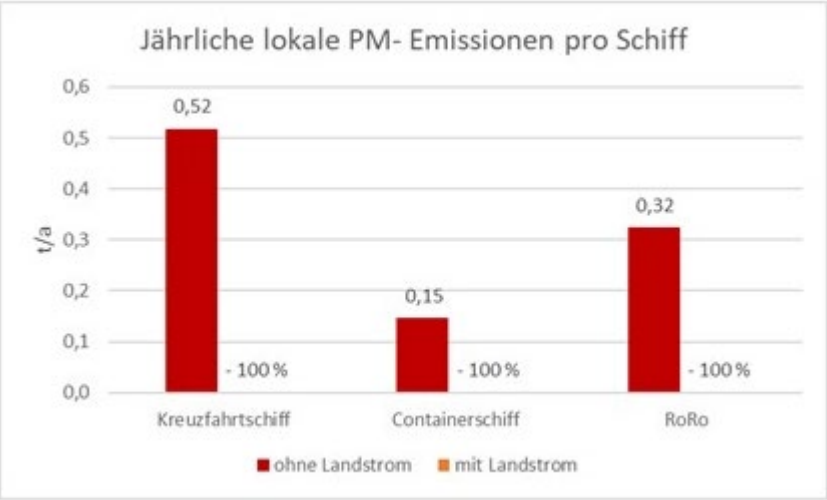

Figure 16: Estimated annual PM emissions per ship type (source: German authorities)

(207) According to the German authorities, with every kWh of shore-side electricity, the following emissions in grams per kWh, currently caused by ship engines, could be consequently reduced:

Schiffstyp	g CO2/kWh	g NOx/kWh	g SOx/kWh	g PM/kWh
Containerschiff	640	12,0	0,39	0,19
Gas-/Öl-/Chemietanker	704	12,5	0,43	0,18
Trockenmassengut	699	13,0	0,43	0,18
konventionelles Mehrzweckschiff	692	14,1	0,42	0,18
Kreuzfahrtschiff	679	12,0	0,41	0,18
Sonstige Seeschiff	737	-	0,45	0,18
Binnenschiff	721	8,1	0,04	0,15
hafeninternes Fahrzeug	726	-	0,04	0,15

Figure 17: Estimate of local air pollutant emissions per kWh per ship type – net emissions linked to electricity generation (source: German authorities[39])

(208) Currently, however, shore-side electricity is considerably more expensive than the electricity generated by the ships' own on-board power supply systems. In this regard, the German authorities explained that operators are therefore majorly relying on electricity generated from on-board diesel generators. Only if the cost of alternative power supply for seagoing ships while at berth is at least not significantly higher, will ship operators make the switch to the environmentally friendly power supply.

(209) Costs for generating electricity on board essentially depend on the oil price. In this context, Germany explained that as the marine fuel used for this purpose is tax-exempt, only marginal costs are incurred for additional wear and tear on the ship's generator in addition to fuel consumption. Various studies from 2011 and 2018 arrive for example - depending on the oil price - at costs for on-board power generation on larger ships (including acquisition costs) of between 10.07

[39] The data on the emissions caused by ship engines for electricity generation in grams per kWh are based on data collected by the German authorities.

ct/kWh[40] and 12.6 ct/kWh[41], whereas the industry currently estimates approximately 10 ct/kWh.

(210) As for shore-side electricity, the German authorities stressed that the costs per kWh cannot be calculated in a fixed and generalised manner. This is because in addition to fixed electricity price components, other varying costs, such as procurement costs, local grid fees, operating costs and the considerable investment costs that may have to be allocated to the electricity price, should also be considered. To illustrate the respective high costs, the German authorities have submitted a sample calculation of the electricity price for the purchase of shore-side electricity with and without a reduced EEG surcharge. Germany explained that based on the following cost items, which vary greatly depending on the type of shore-side electricity facility[42], the estimated total price (exclusive investment cost for shore-side electricity systems) for the purchasing of shore-side electricity would on average amount to 22.23 ct/kWh – 28.23 ct/kWh. In detail:

Einkaufspreis Grünstrom	6,2 ct/kWh
Netzentgelt Arbeitspreis	1,23 ct/kWh
EEG-Umlage	6,756 ct/kWh
KWKG-Umlage	0,226 ct/kWh
Stromsteuer	0,05 ct/kWh
Umlage für abschaltbare Lasten	0,007 ct/kWh
Konzessionsabgabe	0,11 ct/kWh
Umlage nach § 19 II StromNEV	0,358 ct/kWh
Offshore Netzumlage	0,416 ct/kWh
Zwischensumme:	**15,353 ct/kWh**

Figure 18: Fixed costs for the purchase of shore-side electricity (source: German authorities)

20% EEG surcharge	**1.35 ct/kWh**
Sub-total with a 20% EEG surcharge	**9.95 ct/kWh**

Figure 19: Subtotal as demonstrated in Figure 18 with a reduced 20% EEG surcharge

[40] https://www.hamburg.de/contentblob/3126186/c80e1d9001b98cc58f423bfa38e69184/data/gutachten-landstrom.pdf.

[41] DNV GL, 2018, HPA NOX TIER III STUDY, Evaluation of Options for Reduction of In-Port Emissions of Container Ships (not published).

[42] As these are fixed costs, the share per kWh depends on the capacity utilization of the respective plant and the total annual electricity volume.

Netzentgelt Leistungspreis (im Bsp. Hamburg bei 5,5 MW und 8 Std. Liegezeit = 1.265 € / Tag)	2,875 ct/kWh
Betriebskosten Landstromanlage	ca. 4-10 ct/kWh
Investitionskosten Landstromanlage	unbekannt
Gesamtsumme	Mindestens 22,23 ct/kWh

Figure 20: Additional (varying) costs for the purchase of shore-side electricity (source: German authorities)

Total sum **(without EEG surcharge reduction)**	22.23 ct/kWh – 28.23 ct/kWh
Total sum (with a 20% EEG surcharge)	**16.83 ct/kWh – 22.83 ct/kWh)**

Figure 21: Estimated total costs (exclusive investment costs for shore-side electricity systems) for the purchase of shore-side electricity based on Figures 18-20 and with a 20 % EEG surcharge.

(211) At present, an alternative power supply for ships is possible through a shore-side power supply (shore power) or a water-side power supply from barges, where electricity is generated in a floating cogeneration plant using (liquefied) gas. However, an alternative power supply for ships is technically demanding, requires investments by the ship operator as well as expensive infrastructure which is still in the development phase. The EEG surcharge on top of other components of the electricity price increases the price of the shore-side electricity up to a level that makes it uneconomical compared to the generation of on-board electricity with diesel generators. This reduces the economic viability of shore-side electricity projects and seriously jeopardises their realisation.

(212) Therefore, to reduce the high costs of alternative power supply and to increase its acceptance among ship operators, the EEG surcharge for shore-side power was capped at 20% (see Figures 19 and 21 at recital (210) above).

(213) Technically, the new §65b EEG 2021 addresses shore-side electricity facilities. Against this background, pursuant to § 65b(5) EEG 2021, shore-side electricity facilities are defined as any undertaking which operates the entire technical infrastructure located in a geographically coherent area in or adjacent to a port and by means of which seagoing ships can obtain electricity for their on-board network from shore; it must have its own electricity meters at all points of delivery, self-supply installations and transfer points; in addition to the necessary electro-technical components, this also includes the distribution and transfer installations as well as the connection to the public electricity grid. However, Germany has confirmed that the reduced EEG surcharge will be passed on in full to the end consumers who will thus benefit from the aid, i.e., ship operators of seagoing ships at berth who purchase the electricity with a reduced EEG surcharge of only 20% of the original EEG surcharge (see recital (17) above).

(214) The eligibility conditions for a reduced 20% EEG surcharge for shore-side electricity are laid down in the new § 65b EEG 2021, specifying that a shore-side electricity facility is only eligible if it exclusively supplies electricity to seagoing ships at berth. In doing so, only the end consumer in the form of operators of seagoing ships and not any other parties can benefit from the measure, i.e. are supplied with the surcharge-limited electricity as the measure targets solely the reduction of emissions from seagoing ships. Based on the information provided and according to the explanatory memorandum of the respective national legal basis (EEG), the measure does not aim to establish a favourable surcharge provision for other third parties, such as operators of other ships or operators in the electricity chain other than the end consumer.

(215) In addition, the electricity supply of seagoing ships must not be of a permanent nature or intended for a longer period of time (i.e. beyond what can be reasonably justified, in particular on the basis of its commercial or freight operations, or maintenance/repair needs (e.g., the preferential treatment will not apply for a restaurant ship that does not leave its berth throughout the year or only does so rarely; however ferries, and ships that spend several weeks or months at the same berth due to infection control regulations are not covered by the exclusion and thus could benefit from the reduced shore-side electricity). This regulation is intended to exclude potential cases of abuse, e.g. through the establishment of other business activities on seagoing ships.

(216) According to the explanatory memorandum of the respective national legal basis (EEG), §65b (3) EEG 2021 regulates the obligations to provide evidence when applying for the reduced EEG surcharge of 20%. When invoices are submitted to seagoing ships, they must show the amount of electricity purchased.

2.13. Transparency

(217) Germany has committed to fulfil all transparency requirements set out in section 3.2.7 of the EEAG (publication on a comprehensive website of the text of the approved scheme, the identity of the granting authority and – except if the individual aid remains below EUR 500 000 – the identity of the beneficiaries, the form and amount of the aid, the date of granting, the type of undertaking, the region in which the beneficiaries are located and the principal economic sector in which beneficiaries have their activities).

2.14. Evaluation

(218) Germany notified the modified and prolonged EEG 2021 scheme for a period of six years (until 31 December 2026). Germany has committed to submit the final evaluation report to the Commission nine months before the end of the scheme, by 31 March 2026. In order to keep the Commission updated about the progress of the evaluation in terms of data collection and methodologies (including potential difficulties encountered), an intermediate evaluation report is due in the first half of 2024. In order to be able to approve the EEG 2021, the Commission notes that the evaluation plan, as well as the report, for the EEG 2021 had to be updated and improved as compared to the EEG 2017 plan and report.

(219) The EEG 2017, the predecessor scheme of the EEG 2021, has been the subject of ex post evaluation in the past. In 2019, Germany published an ex post evaluation

report of the EEG 2017[43]. Under the EEG 2017, several tenders for offshore wind energy[44], onshore wind energy, biomass plants and solar photovoltaic (PV) installations were conducted by the BNetzA. The final report (the '2019 evaluation report') evaluates the tender rounds, which were completed by 1 September 2019.

(220) The evaluation plan of the EEG 2017 included around 70 evaluation questions aiming at assessing different aspects of the aid scheme, including direct and indirect effects, proportionality and appropriateness of the instrument.

(221) Regarding the data used, the 2019 evaluation report employs anonymised bidding data for onshore wind, biomass and solar PV energy. Moreover, some of the information has been collected through an ad-hoc bidder survey run in the autumn of 2019, as well as by using general statistical sources on electricity, as foreseen in the evaluation plan.

(222) Regarding the methodologies applied in the 2019 evaluation report, a large part of the evaluation questions were foreseen to be answered via quantitative evidence, while for others qualitative evidence was foreseen. To assess the direct effects of the aid, the evaluation plan foresaw the use of counterfactual impact evaluation methods. However, the plan also mentioned that the application of these counterfactual evaluation methods (comparing projects that were just awarded aid following the tender procedure and projects that did not receive any aid) was subject to data availability.

(223) The 2019 evaluation report found that by 2020 the (technology-specific) energy generation objectives for onshore wind, solar PV and biomass were expected to be obtained for solar PV only. In the case of onshore wind and biomass projects, the targets would likely not be met due to the lack of tender participation. The 2019 evaluation report also found that tenders lead to higher cost effectiveness in the case of solar PV by reducing the amount of the support granted to the successful projects in the tender procedure. The positive effect of tendering on cost effectiveness was not observed in the case of biomass projects and it was ambiguous in the case of onshore wind. A higher degree of competition in the case of solar PV projects did lead to the more beneficial effects of tendering.

(224) However, the conclusions in the 2019 evaluation report have to be interpreted with caution, as they were merely drawn from descriptive statistics and lacked a proper empirical counterfactual analysis. The evaluation could hence not identify the causal impact of the intervention due to the lack of a suitable counterfactual scenario. According to the 2019 evaluation report, the supported and non-supported projects cannot be compared since the two groups are systematically different, so that a proper regression discontinuity analysis was not possible. Alternatively, a comparison with similar projects in neighbouring countries was also difficult since these projects are subject to other types of support and operate in a different framework (for instance different energy prices or grid congestion).

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[43] Navigant et al. (2019), '*Externer Evaluierungsbericht der Ausschreibungen für erneuerbare Energien - Ausschreibungen für Erneuerbare Energien nach dem Erneuerbare-Energien-Gesetz (EEG) und dem Windenergie-auf-See-Gesetz (WindSeeG)*'.

[44] Since the evaluation of the support to offshore wind installations connected to the grid has been discussed in the decision concerning case SA.57610 (2020/N), the particularities of the evaluation regarding offshore wind projects will not be discussed in the context of the current decision.

(225) In summary, regarding the data and methodology used in the 2019 evaluation report, the Commission notes that the evaluation of the EEG 2017 failed to identify the causal impact of the aid by the lack of an appropriate counterfactual analysis. Germany has committed to address this major shortcoming of the previous ex post evaluation in the notified evaluation plan on the EEG 2021.

(226) The evaluation plan notified by Germany in the context of the EEG 2021 includes around 25 evaluation questions in order to assess the scheme's outputs and its direct effects on the beneficiaries, its indirect effects, as well as the proportionality of the aid and the appropriateness of the chosen aid instrument.

(227) First, the evaluation will provide general information, in particular, on the following broad range of topics for both installations awarded through tenders and through administratively set remuneration:

a. Development of the number of installations, investments and capacity built for the production of energy from renewable energy technologies (solar PV, onshore wind, biomass, geothermal heat and hydropower[45]), compared to a counterfactual of no aid; to measure the direct impact of the aid scheme on these developments, the projects developed with the financial support of the EEG scheme ('treatment group'), will be compared with the projects developed without EEG aid ('control group'), whereby in the case of tenders the control group can be both projects that participated but were unsuccessful in the tender procedure, or projects which were developed without even participating in the tender;

b. Simulation of the impact on the costs of the EEG scheme, when increasing or reducing the tendered volumes (based on the analysis of all bids received in the tender ('supply curve analysis'));

c. Contribution of each technology to the reduction of CO2 emissions in the electricity sector, and to the achievement of the (environmental) objectives of the scheme;

d. Impact on competition in energy markets (development of market concentration, wholesale prices, consumer prices);

e. Comparison of the costs of the EEG with LCOE estimates of renewable energy production per technology type, in order to assess the need and proportionality of the aid;

f. Assessment of the competitiveness of the tenders; comparison of competition between different tender formats over the various technologies;

g. Evolution of the aid amounts granted over time, whether allocated through tenders or in the administrative segment.

(228) In addition to the general evaluation questions, the evaluation will also provide insights into the impact of certain specific features of the scheme and will address technology-specific elements for each of the specific technologies addressed in this decision. In particular, it will examine:

[45] The evaluation of the support to offshore wind installations connected to the grid is part of the overall evaluation of the EEG 2021, but has been described and assessed in the context of case SA.57610 (2020/N).

a. Comparison of the various types of remuneration (fixed premium versus variable premium on top of the electricity price);

b. Impact of the limitation on the number of hours (6, 4 or none) up to which remuneration is paid during periods of negative prices, in order to verify the incentives to produce during times of reduced demand/excessive supply;

c. Assessment of the impact of remaining local energy project privileges ('*Bürgerenergieprojekte*') on the tenders;

d. Assessment of specific characteristics of biomass tenders, innovation tenders, and impact of measures to ensure competitiveness of onshore wind tenders;

e. Assessment of the impact of the reference yield model ('*Referenzertragmodel*') for onshore wind tenders.

(229) Evaluation questions related to the general outputs of the scheme will be primarily answered by providing quantitative evidence, while other questions may require qualitative assessment. To evaluate the direct effects of the scheme, Germany has committed to further extending the methodology used so far in the evaluation reports by employing, to the extent possible given data availability, counterfactual impact evaluation methods in line with the Commission Staff Working Document on Common methodology for State aid evaluation[46] (cf. section 3.3.6).

(230) In order to perform the evaluation, Germany has confirmed that the required data can be collected and will be made available to the evaluators, who are required to keep confidentiality. General energy statistics will also be used, as well as some targeted qualitative information, ad hoc studies and surveys. Moreover and in particular in relation to the tender and bid information, the BNetzA will provide the independent evaluator with the necessary data for conducting the evaluation in full respect of data protection rules and while ensuring protection of business secrets and sensitive information. In this way, the problem encountered during the previous evaluation, whereby not sufficient data was available in order to answer all evaluation questions, will be avoided. Germany also committed to make use of data from EEG 2017 projects in order to have sufficient data points to carry out the quantitative analysis.

(231) The evaluation will be conducted by an external independent evaluator to be selected through an open tender procedure. Germany has committed to duly consider the relevant experience of the tender applicants notably in the field of quantitative evaluation methods.

(232) The evaluation report will be published on the website of the German Ministry for Economic Affairs and Energy. Germany will take the evaluation results duly into account for future policy-making.

[46] Commission Staff Working Document on Common methodology for State aid evaluation, Brussels, 28.5.2014, SWD(2014) 179 final.

2.15. Other commitments

(233) Germany has committed to respect both the waste hierarchy[47] (transposed through the Kreislaufwirtschaftsgesetz), as well as the Water Framework Directive[48] (transposed through the Wasserhaushaltsgesetz).

(234) The German authorities have also committed to suspend the payment of the notified aid, if the beneficiary still has at its disposal an earlier unlawful aid that was declared incompatible by a Commission Decision (either concerning an individual aid or an aid scheme), until that beneficiary has reimbursed or paid into a blocked account the total amount of unlawful and incompatible aid and the corresponding recovery interest.

(235) The German authorities have also committed not to award aid to undertakings in difficulty, as defined by the applicable Guidelines on State aid for rescuing and restructuring undertakings in difficulty[49].

3. ASSESSMENT

3.1 Presence of State Aid

(236) Germany has notified the measures as defined in recital (6) as State aid. Germany submits in particular that the measures are financed from State resources. In Germany's view, this qualification is due to the payment of financial means from the Federal budget into the EEG account (see recitals (183)-(186)).

(237) Under Article 107(1) TFEU, any aid granted by a Member State or through State resources in any form whatsoever which distorts or threatens to distort competition by favouring certain undertakings or the production of certain goods, in so far as it affects trade between Member States, is incompatible with the internal market.

(238) To determine whether a measure constitutes State aid within the meaning of Article 107(1) of the Treaty, the measure must:

- confer an advantage on certain undertakings or certain sectors (selective advantage),
- be imputable to the State and involve State resources,
- distort or threaten to distort competition, and
- be liable to affect trade between Member States.

3.1.1 Existence of a selective advantage

(239) Regarding the support of electricity generated from new and modernised renewable installations and mine gas, the Commission notes that producers of EEG electricity are advantaged by the measure because, through the market

[47] Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives (OJ L 312 of 22.11.2008, p. 3).

[48] Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy (OJ L 327, 22.12.2000, p. 1).

[49] Communication from the Commission — Guidelines on State aid for rescuing and restructuring non-financial undertakings in difficulty (OJ C 249, 31.7.2014, p. 1).

premiums, feed-in tariffs and flexibility premiums, they obtain more than what they would obtain on the market. Indeed, these payments guarantee that producers of EEG electricity will obtain a price for their electricity that is higher than the market price. They are thus advantaged by the EEG-system. Furthermore, the aid is selective, since it only applies to EEG electricity technologies, as opposed to conventional electricity production technologies. It also only applies to EEG electricity production facilities located in Germany or, potentially in the future, to production facilities in countries with whom Germany has signed cooperation agreements.

(240) To establish whether the reduced EEG surcharges are selective and thus potentially constitute a selective advantage it needs to be established whether they constitute a derogation from a reference system, insofar as they differentiate between economic operators who, in light of the objectives intrinsic to the system, are in a comparable factual and legal situation. Finally, it would need to be established whether the derogation is justified by the nature or the general scheme of the (reference) system[50]. Should there be no such justification, the measure can be considered to be selective.

3.1.1.1 Identification of the reference system and of the normal charge principle

(241) The reference system with regard to the EEG surcharge is that the surcharge is uniform per kWh of electricity consumed by each end consumer. It serves to cover the difference between the costs resulting from the support for EEG electricity and the revenues. The TSOs are entitled and obliged to claim the EEG surcharge directly from electricity suppliers[51]. They are also entitled and obliged to claim the EEG surcharge from final consumers on the electricity that is not supplied to them by electricity suppliers but is either self-supplied or supplied by a third party other than an electricity supplier[52].

(242) The reduced EEG surcharge for energy-intensive users as well as for shore-side electricity is defined in deviation from the full EEG surcharge[53]. The EEG surcharges which the various groups of final consumers and self-suppliers identified in §61(a) et seq. of the EEG 2021 have to pay are defined as a percentage of and by reference to the full EEG surcharge. They do not constitute another kind of surcharge, which further confirms that the full EEG surcharge constitutes the rule and the point of reference.

(243) In addition, the purpose of the surcharge is to finance the support for the production of EEG electricity which serves the climate objectives of Germany. The EEG 2021 explicitly states that its rationale is to contribute to the sustainable development of energy supply in Germany by increasing the share of renewable electricity production. Renewable electricity should make up 65% of electricity consumption by 2030[54].

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50 See, for instance, Judgment of the Court of Justice of 8 September 2011, *Commission v Netherlands,* C-279/08 P, ECLI:EU:C:2011:551, paragraph 62; Judgment of the Court of Justice of 8 November 2001, *Adria-Wien Pipeline*, C-143/99, ECLI:EU:C:2001:598.

51 §60 (1) of the EEG 2021.

52 §61 (1) of the EEG 2021.

53 §60a of the EEG 2021.

54 §1(2) of the EEG.

(244) On this basis, it must be concluded that under the EEG surcharge system the EEG surcharge is in cents per kWh and is in principle to be levied equally on each kWh of electricity consumed by each end consumer.

3.1.1.2 Deviation from the Reference System

(245) The categories of end consumers described under section 2.12 of this Decision only pay a reduced EEG surcharge or are even exempted from the EEG surcharge. This constitutes a deviation from the reference system, as normally, under that reference system, those end consumers would have been subjected to the full EEG surcharge. Energy-intensive users and shore-side electricity are in a comparable legal and factual situation with all other energy users subject to the full EEG surcharge in the light of the purpose of the that system, which is the financing of renewable electricity and the spreading of the costs among all end consumers (see recitals (16)-(17) and (20) to (22) of this Decision).

3.1.1.3 Justification for the deviation from the reference system

(246) A measure which derogates from the reference system may still be found to be non-selective if it is justified by the nature or general scheme of that system (see recital (239) of this Decision and the case law referred to therein). This is why it needs to be established whether undertakings benefiting of a reduced EEG surcharge do so as a result of the intrinsic basic or guiding principles of the reference system.

(247) As mentioned above, the EEG rests on the principle that the EEG surcharge is levied on all electricity consumed in Germany. Moreover, energy-intensive users and shore-side electricity are in a comparable legal and factual situation with all other energy users subject to the full EEG surcharge (see recital (245) of this Decision). The ultimate goal being to contribute to the reduction of CO2 emissions in Germany. They equally benefit from a more sustainable electricity supply in Germany in the same way as other final consumers which will need to pay the full EEG surcharge. The Commission considers that there is no justification inherent to the system for the deviation from the reference framework.

3.1.1.4 Conclusion on selective advantage of reduced EEG surcharges

(248) The section above demonstrates that the reduced EEG surcharges deviate from the reference system and that there is no justification for the deviation that can be derived from the nature or the general scheme of the system itself. The EEG surcharge reductions are therefore selective. The reduced EEG surcharges constitute an advantageous treatment of these specific end-users compared to end-users having to pay the full EEG surcharge. The reduced EEG surcharges, therefore, constitute a selective advantage for the end-users concerned.

3.1.2 Imputability and existence of State resources

(249) The financing of support for the measures is imputable to the State, as they are established by law (EEG 2021) and implementing decrees (see section 2.1 above).

(250) Only advantages which are granted directly or indirectly through State resources are to be regarded as aid within the meaning of Article 107(1) TFEU.

(251) In particular, the Commission notes that the State established by law a surcharge on electricity consumption (see §60 to §61 EEG 2021 and see section 2.11 of this Decision). On the one hand, the EEG 2021 provides that TSOs are obliged to collect this surcharge from electricity suppliers and directly from certain categories of end consumers (see recital (174) above). On the other hand, operators on which the surcharge is levied have to pay it (see recitals (174) and (175) above). In line with the EEG 2012 judgment[55], the EEG surcharge therefore qualifies as a levy imposed by law.

(252) As explained in section 2.11, the EEG 2021 and its implementing regulations (EEV, EEAV) also set the methodology to determine the level of the surcharge and set the level of the surcharge directly for certain categories of consumers. The law further determines to what purposes the surcharge can be used and how any surpluses or deficits are corrected (see recital (175)). The Commission further notes that the TSOs have been entrusted with the calculation of the surcharge based on the methodology set out in the EEG 2021 and in its implementing regulations and manage the financial flows of the surcharge. The way that those entities manage the surcharge is monitored by the State (see recitals (181) and (182) of this Decision). Besides, an agency of the State, the BNetzA, is empowered to monitor the entire system (recital (181)).

(253) The State has, within the framework of the EEG 2017 (and maintained in the EEG 2021), created a system where the costs incurred by the network operators to pay the feed-in tariffs and premiums to owners of electricity installations eligible under the EEG Act are fully compensated by the levy imposed obligatorily by law on suppliers and certain categories of consumers. The support is financed from State resources given that it is financed from the proceeds of a levy imposed by the State and which are managed and apportioned in accordance with the provisions of the legislation. Indeed, if national law requires a charge to be passed on to a given group of persons, that charge is compulsory and thus the funds raised are State resources. This differentiates the EEG 2017 from the EEG 2012, where the pass-on of the cost by system operators was not legally mandatory, even though in practice operators did pass on the full cost[56].

(254) In addition, as highlighted above, the compulsory charge originates from the State, in the sense that the State did not limit itself to rendering compulsory for a group of private persons a contribution that was introduced and administered by an association of such private persons as in the *Pearle and Doux Élevage* case-law[57]. Moreover, the support granted to EEG electricity does not constitute prices or fees for goods or services. Indeed, the support is paid by network operators to pay in particular premiums to operators of EEG electricity installations, although the electricity is not sold to the network operators but to third parties (see recitals (24) and (25)). In some cases, the electricity is not even fed into the grid.

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55 Judgment of 28 March 2019, C-405/16 P, *Germany v Commission*, EU:C:2019:268, paragraphs 57-60 and 70.

56 Judgment of 28 March 2019, C-405/16 P, *Germany v Commission*, EU:C:2019:268, paragraph 71.

57 Judgment of 15 July 2004, *Pearle and Others*, C-345/02, EU:C:2004:448; Judgment of 30 May 2013, *Doux Élevage and Coopérative agricole UKL-ARREE*, C-677/11, EU:C:2013:348.

(255) In addition to the above, which would already suffice to qualify the support to RES electricity and mine gas covered by this decision as financed from State resources, the German government has introduced a mechanism, by which direct payments are made from the State budget to the EEG account in order to reduce the level of the levy (see recitals (183) to (186)). This further corroborates the finding that the measures involve State resources.

(256) As the Commission has observed that the EEG surcharge constitutes a State resource, a reduced EEG surcharge for EIUs or shore-side electricity installations implies a renouncement to State resources.

3.1.3 Impact on trade between Member States and on competition

(257) The beneficiaries of the scheme are EEG electricity installations, as well as energy-intensive users from various industries and ship operators of seagoing ships as regards shore-side electricity. In all those sectors, trade takes place between Member States, and the beneficiaries are in competition with undertakings located in other Member States. Also, the electricity market is liberalised and electricity is traded between Member States. The EEG electricity is generally sold on the spot market, where it enters in competition with all sources of electricity. The German spot market is interconnected with other markets. The measure is therefore liable to distort competition and affect trade between Member States.

3.1.4 Conclusion on the existence of aid

(258) The Commission concludes that the support for EEG installations as well as the reductions of the EEG surcharge described under section 2 of this Decision entail aid. As mentioned above (recital (236)), the German authorities do not contest this conclusion.

3.2 Lawfulness of the aid

(259) The scheme was notified to the Commission. It has not been implemented before. Germany has complied with its obligations under Article 108 TFEU.

3.3 Compatibility

(260) The Commission has assessed the measures on the basis of Article 107(3)(c) TFEU and the EEAG. In particular, it has assessed the support to the production of renewable electricity under section 3.3 (Aid to energy from renewable sources), the support to mine gas installations under section 3.5 (Aid for resource efficiency and in particular aid to waste management), the support to EIUs under section 3.7 (Aid in the form of reductions in or exemptions from environmental taxes and in the form of reductions in funding support for electricity from renewable sources) and the support to shore-side electricity under section 3.2 of the EEAG (General compatibility provisions).

(261) On 2 July 2020, the Commission adopted a Communication[58] prolonging the validity of certain State aid rules, including the EEAG, which would have otherwise expired at the end of 2020.

(262) Article 107(3)(c) TFEU provides that the Commission may declare compatible '*aid to facilitate the development of certain economic activities or of certain economic areas, where such aid does not adversely affect trading conditions to an extent contrary to the common interest*'.

3.3.1 Aid to producers of electricity from RES

3.3.1.1 Contribution to the development of an economic activity

(263) Pursuant to Article 107(3)(c) TFEU, compatible aid must contribute to the development of an economic activity[59].

(264) The scheme supports the generation of electricity from new RES installations, as well as for the modernisation of hydropower installations and for modernised biomass/biogas installations under certain conditions.

(265) According to point 19(5) EEAG, the following are renewable energy sources: wind, solar, aerothermal, geothermal, hydrothermal and ocean energy, hydropower, biomass, landfill gas, sewage treatment plant gas and biogases. According to point 19(11) EEAG, the definition of electricity generated from RES also includes renewable electricity used for filling storage systems, but excludes electricity produced as a result of storage systems.

(266) In view of the above, the Commission considers that the notified scheme contributes to the development of an economic activity, in particular, electricity production, as required by Article 107(3)(c) TFEU.

3.3.1.2 Facilitation of an economic activity and incentive effect

(267) State aid has an incentive effect if it incentivises the beneficiary to change its behaviour towards the development of a certain economic activity pursued by the aid and if the change in behaviour would not occur without the aid[60].

(268) In order to demonstrate the presence of an incentive effect, the need for an application form in point 51 of the EEAG does not apply if the aid will be awarded on the basis of a competitive bidding process (point 52 of the EEAG).

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[58] Communication from the Commission concerning the prolongation and the amendments of the Guidelines on Regional State Aid for 2014-2020, Guidelines on State Aid to Promote Risk Finance Investments, Guidelines on State Aid for Environmental Protection and Energy 2014-2020, Guidelines on State aid for rescuing and restructuring non-financial undertakings in difficulty, Communication on the Criteria for the Analysis of the Compatibility with the Internal Market of State Aid to Promote the Execution of Important Projects of Common European Interest, Communication from the Commission - Framework for State aid for research and development and innovation and Communication from the Commission to the Member States on the application of Articles 107 and 108 of the Treaty on the Functioning of the European Union to short-term export-credit insurance. (OJ C 224, 8.7.2020, p. 2–4). See, EUR-Lex - 52020XC0708(01) - EN - EUR-Lex (europa.eu).

[59] Judgment of 22 September 2020, *Austria v Commission*, C-594/18 P, EU:C:2020:742, paragraphs 20 and 24.

[60] See in that sense points 49 and 144 of the EEAG, as well as Judgment of 22 September 2020, *Austria v Commission*, C-594/18 P, EU:C:2020:742.

As mentioned in section 2, installations with an installed capacity above 750 kW (for onshore wind and PV, both ground-based and rooftop), 150 kW (for new biomass and biomethane installations) and modernised biomass installations in general are awarded through tenders. Moreover, PV installations between 300 and 750 kW can opt to participate in tenders. Therefore, Germany is not required to fulfil the requirements of point 51 of the EEAG for these installations.

(269) In addition, the targeted tendered and administratively remunerated projects would not be executed in the absence of the aid (and existing projects discontinued or not modernised for aided existing biomass and hydropower installations), given the gap between the cost to produce the electricity based on the respective RES and the market price for electricity which is generally lower (see section 3.3.1.4.(c)).

(270) The Commission therefore concludes that the aid has an incentive effect and facilitates the development of electricity generation from RES.

3.3.1.3 Compliance with other relevant provisions of EU law

(271) State aid which contravenes provisions or general principles of EU law cannot be declared compatible[61].

(272) As indicated in point 29 of the EEAG, if a State aid measure or the conditions attached to it (including its financing method when it forms an integral part of it) entail a non-severable violation of Union law, the aid cannot be declared compatible with the internal market. In the field of energy, any levy that has the aim of financing a State aid measure needs to comply in particular with Articles 30 and 110 TFEU.

(273) As the support for electricity generated by RES is financed by a charge levied on all electricity consumption, the Commission has examined its compliance with Articles 30 and 110 of the Treaty.

(274) According to the case-law, a charge which is imposed on domestic and imported products according to the same criteria may nevertheless be prohibited by the Treaty if the revenue from such a charge is intended to support activities which specifically benefit the taxed domestic products. If the advantages which those products enjoy wholly offset the burden imposed on them, the effects of that charge are apparent only with regard to imported products and that charge constitutes a charge having equivalent effect to custom duties, contrary to Article 30 of the Treaty. If, on the other hand, those advantages only partly offset the burden borne by domestic products, the charge in question constitutes discriminatory taxation for the purposes of Article 110 of the Treaty and will be contrary to that provision as regards the proportion used to offset the burden borne by the domestic products[62].

(275) When domestic electricity production is supported by aid that is financed through a charge on all electricity consumption (including consumption of imported electricity), then the method of financing – which imposes a burden on imported

[61] Judgment of 22 September 2020, *Austria v Commission*, C-594/18 P, EU:C:2020:742, paragraph 44.

[62] Judgment of 14 April 2005, Joined Cases C-128/03 and C-129/03, *AEM* and *AEM Torino*, EU:C:2005:224, paragraphs 44 to 47; Judgment of 17 July 2008, C-206/06, Essent Netwerk Noord and Others, EU:C:2008:413, paragraph 42.

electricity not benefitting from this financing – risks having a discriminatory effect on imported electricity and thereby violating Article 30 or 110 of the Treaty[63].

(276) The scheme is financed by a surcharge on electricity consumption. In this respect, the Commission notes that:

(a) the notified aid scheme is financed through a charge imposed on electricity consumed in Germany, irrespective of whether domestically produced or imported;

(b) the surcharge is levied by network operators and calculated based on the amount of electricity consumed (and thereby imposed on the product itself).

(277) Where aid for domestic producers is financed through a charge that is levied on imported and domestic products alike, the charge may have the effect of further exacerbating the distortion on the product market caused by the aid as such. For that matter, it is not necessary that the charge exclusively finances the aid, since the additional distortive effect can already be present if a sizable share of the revenue from the charge is used to finance the aid.

(278) In order to alleviate any concern regarding compliance with Articles 30 and 110 TFEU, Germany has created enabling rules such that producers located in other Member States could be allowed to bid for capacity allocated within the tenders. The participation of producers from other Member States in the support scheme is subject to a cooperation agreement with the relevant Member State (as also set out in point (122) EEAG) and to a limit of 5%. The Commission therefore concludes, in accordance with its case practice[64], that enabling an opening of the scheme in this manner reduces the risk of possible discrimination against producers of renewable electricity in other Member States.

(279) As set out in recital (233), Germany has also confirmed its compliance with the Water Framework Directive and the waste hierarchy.

(280) In light of the above, the Commission considers that the notified aid measure does not infringe other relevant provisions of EU law.

3.3.1.4 The aid is designed in order to limit its effects on competition and trade

3.3.1.4.1 Need for State intervention

(281) Point 34 of the EEAG explains that State aid should be targeted towards situations where aid can bring about a material improvement that the market alone cannot deliver. Point 35 of the EEAG invites Member States to identify the market failures hampering an increased level of environmental protection. In the case of renewable electricity production, the Commission presumes that a residual market failure remains, which can be addressed through aid for renewable energy, for the reasons set out in point 115 of the EEAG.

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63 Judgment of 25 June 1970, 47/69, *France v Commission*, EU:C:1970:60, paragraph 20. See also Case SA.38632 (2014/N) Germany – EEG 2014 – Reform of the Renewable Energy Law.

64 Decision of 23 July 2014 in case SA.38632 and Decision of 20 December 2016 in case SA.45461.

(282) According to the LCOE calculations provided by Germany (see section 2.6.2), the cost of electricity generation from RES is higher than the market price for electricity observed in recent years (see recital (40)), even where revenues are optimised with self-consumption. The COVID-19 pandemic had a significant impact on electricity prices in Germany (and the whole EU) in 2020. The spot market price decreased from 40 EUR/MWh at the end of 2019 to less than 10 EUR/MWh in April 2020. Since September 2020 prices are again at 2019 levels (around 40 EUR/MWh), and Germany expects them to remain relatively low in the next years, until the economy fully recovers from the pandemic. For the middle to long term electricity prices may increase again, but for the duration of the scheme (until the end of 2026), the costs of generation from RES generation are expected to remain above the market price of electricity.

(283) Against this background, it is unlikely that, absent the aid, the development of the economic activity of generation of electricity from RES in Germany would occur, or would occur to the same extent. The Commission therefore considers that the notified scheme is necessary.

3.3.1.4.2 Appropriateness of the aid

(284) Point 40 of the EEAG explains that aid measures must be appropriate and that an aid measure will not be considered compatible with the internal market if the same outcome is achievable through other less distortive policies or aid instruments.

(285) Point 116 of the EEAG states that the Commission presumes the appropriateness of aid for renewable energy sources provided all other conditions of section 3.3.2 of the EEAG are met. According to point 107 of the EEAG, under certain conditions State aid for renewable energy sources can be an appropriate instrument to increase renewable electricity production.

(286) As mentioned in recitals (9) and (13), the EEG 2021 aims at significantly increasing the electricity produced from RES (from 259 TWh in 2021 to 318 TWh in 2026) and therefore the installed RES capacity (for example from 52 GW in 2021 to 83 GW in 2026 for solar PV) in order to further reduce CO2 emissions in the future[65].

(287) The notified measure is therefore deemed appropriate provided that the other compatibility conditions are met. As explained in sections 3.3.1.1-3.3.1.3, 3.3.1.4(a) above and as will be shown in the sections below, these other compatibility conditions are met. Therefore, the Commission considers the aid to be appropriate.

3.3.1.4.3 Proportionality of the aid

(288) According to point 69 of the EEAG, environmental aid is considered to be proportionate if the aid amount per beneficiary is limited to the minimum needed.

(289) The aid supports electricity production from renewable sources, for which the EEAG include specific rules, in particular in points 124, 126 and 129.

[65] The EEG 2021 as amended says in § 1(2): '*Ziel dieses Gesetzes ist es, den Anteil des aus erneuerbaren Energien erzeugten Stroms am Bruttostromverbrauch auf 65 Prozent im Jahr 2030 zu steigern.*.'

3.3.1.4.3.1 Aid granted as premium and market integration

(290) The scheme complies with point 124 of the EEAG. This point requires aid to be paid as a premium in addition to direct selling in the market, balancing responsibilities and no incentive to produce in hours of negative prices. Point 125 exempts small installations below 500 kW (except for wind, where a maximum of 3 MW or 3 generation unit applies) and demonstration projects from these requirements.

(291) As explained in section 2.4, the aid to RES producers is provided in the form of a variable premium, taking into account revenues from the sale of electricity. Installations also have an obligation to sell their produced electricity on the market. Germany has confirmed that beneficiaries selling their electricity on the market will have standard balancing responsibilities (see recital (33)). Only installations below 100 kW are exempted from these requirements. This capacity threshold is lower than those established under point 125 EEAG and hence complies with it.

(292) Feed-in tariffs are also available as fall-back feed-in tariff ('*Ausfallvergütung*'). As set out in recital (28), that provision is meant as a last resort clause to be used in exceptional situations, when at short notice due to unforeseen circumstances a beneficiary cannot find a buyer for its RES electricity.

(293) In order to make sure that the emergency feed-in tariffs are used only in those emergency situations, the back-up feed-in tariffs are reduced by 20% compared to the normal feed-in tariffs and are thus lower than the level required to cover production costs and reasonable rate of return. It is also limited in time (maximum three months in a row and six months per year in total).

(294) Given that as a rule producers are under the obligation to directly sell on the market, and data provided by Germany confirms the fall-back feed-in tariff constitutes an emergency instrument only and does not incentivize producers to request this remuneration instead of selling their electricity directly on the market, the Commission concludes that it is unlikely to undermine the incentive to directly sell into the market.

(295) In addition, no subsidy will be paid for hours in which the spot market price is negative, whenever negative prices persist for at least 4 consecutive hours (§51 EEG 2021). This applies for all RES plants above 500 kW, except for onshore wind pilot installations. Germany has further explained that the market premium itself reduces incentives for RES electricity operators to produce in times of negative prices, at least when the negative prices reach a certain level. As a rule, producers will stop producing once the negative prices are not compensated anymore by the market premium. If for instance the market premium of the previous month was of 40 €/MWh for onshore wind, the producer will tend to switch off the wind turbine or at least will stop feeding the electricity into the grid once negative prices reach around –40€/MWh. A producer of electricity from biomass or biogas will generally stop feeding electricity into the grid already earlier given that those producers have higher marginal costs than onshore wind electricity producers.

(296) The Commission welcomes that Germany reduced the number of consecutive hours of negative prices after which no subsidy is paid, from six hours (EEG

2017) to four hours. Nevertheless, the number of hours in which prices are negative have increased in Germany in past years, and Germany has committed to further analyse this issue as one of the aspects of the evaluation exercise.

(297) Finally, Germany will add the number of non-remunerated negative price hours at the end of the support period for contracts awarded through tenders. In the view of the Commission, this latter mechanism does not change producers' incentives not to produce in hours of negative prices, as the payment is dissociated from the hours of negative prices.

(298) As a consequence of the above, the Commission can conclude that no incentives are provided to produce electricity at times of negative prices (when demand is lower than supply).

3.3.1.4.3.2 Competitive bidding process (Tendering)

(299) According to point 126 of the EEAG, the aid is presumed to be proportionate if it is granted in a competitive bidding process open to all generators producing electricity from renewable energy sources on a non-discriminatory basis, unless a) Member States demonstrate that only one or a very limited number of projects or sites could be eligible; or b) Member States demonstrate that a competitive bidding process would lead to higher support levels (for example to avoid strategic bidding); or c) Member States demonstrate that a competitive bidding process would result in low project realisation rates (avoid underbidding). The bidding process should in principle be open to all technologies. It can be limited to certain technologies in certain circumstances (point 126, fifth subparagraph, EEAG), where a process open to all generators would lead to suboptimal results which cannot be addressed in the process design in view of (a) the longer-term potential of a given new and innovative technology, (b) the need to achieve diversification, (c) network constraints and grid stability, (d) system (integration) costs, or (e) the need to avoid distortions on the raw material markets from biomass support.

(300) The requirement to conduct a competitive bidding process is not mandatory for installations with less than 1 MW of capacity (all technologies except wind energy), of not more than 6 MW or 6 generation units for wind energy, and demonstration projects.

(301) Those installations – if they are not supported in the framework of a competitive bidding process – need to comply with the conditions set out in point 131 of the EEAG (see point 128 of the EEAG), which are:

(a) The aid per unit of energy does not exceed the difference between the total levelized costs of producing energy (LCOE) from the particular technology in question and the market price of the form of energy concerned.

(b) The LCOE may include a normal return on capital. Investment aid is deducted from the total investment amount in calculating the LCOE.

(c) The production costs are updated regularly, at least every year.

(d) Aid is granted until the plant has been fully depreciated according to normal accounting rules in order to avoid that operating aid based on LCOE exceeds the depreciation of the investment.

(302) In the following, the Commission has thus first examined whether the aid would be granted based on a competitive bidding process open to all or several technologies. For aid to specific RES technologies granted within a technology specific bidding process (in the absence of competition between several technologies), the Commission assessed whether there were reasons for such limitation in light of point 126, fifth subparagraph EEAG.

(303) For all RES technologies to which aid would be granted based on a competitive bidding process, the Commission examined whether the bidding process would be competitive and based on clear, transparent and non-discriminatory criteria.

(304) If the aid would be granted without competitive bidding process, the Commission examined whether this is justified in light of point 126, third subparagraph, litera a) to c), and 127 of the EEAG and examined the proportionality of the aid based on point 131 of the EEAG in the following section.

3.3.1.4.3.2.1 Landfill gas, sewage gas and geothermal

(305) Germany does not plan to grant support to installations producing electricity from landfill gas, sewage gas and geothermal energy on the basis of tenders (see recital (18)).

(306) As set out in recital (132), Germany has confirmed that for landfill and sewage gas the trend already described in decision SA.45461 (recitals (205) and (206)) has continued and their numbers and the electricity produced from them was stable or even decreasing. There are at best very few new projects being developed (if any), which would render technology-specific tenders uncompetitive. In competition with other technologies, this projects would not create any competitive pressure.

(307) The Commission therefore considers that the exemption from tenders for installations of 1 MW and more producing electricity from landfill gas and sewage gas is in line with point 126 of the EEAG.

(308) As to geothermal installations, the Commission notes that this technology is in Germany not yet very developed and that production costs are still very high (25.2 ct/kWh) compared to all the other technologies and that economies of scale are not yet expected. As set out in recital (139), on average only one installation is put into operation per year. The Commission therefore agrees with Germany that putting this technology in competition with the other cheaper technologies could jeopardize the longer term potential of this technology (paragraph 126, fifth subparagraph, litera (a), of the EEAG). In particular, given also the important upfront investments and uncertainties as to the geological potential of the project, investors would not be willing to take up the exploration risk knowing that they would not have any possibility to recoup those costs later as their chances to be selected in a tender by bidding their production costs seem in the current stage of the development of the technology close to null. Furthermore, given the limited number of projects expected in the coming years a tender limited to geothermal installations would not be competitive.

(309) The Commission therefore considers that the exemption from tenders for installations producing electricity from geothermal energy above 1 MW is in line with paragraph 126 of the EEAG.

3.3.1.4.3.2.2 Hydropower

(310) Germany has demonstrated that organizing an auction that would put hydropower installations in competition with other technologies would lead to suboptimal results.

(311) If put in competition with solar and onshore wind installations, eligible hydropower installations are likely not to be selected in the auction given that solar and wind installations have relatively high additional development potentials and also lower costs compared to new smaller hydropower installations, which as displayed in recital (153) is the bulk of projects entering into operation over recent years.

(312) An auction putting hydropower installations with installed capacity above 1 MW in competition with biomass/biogas installations with an installed capacity of 150 kW and above would also lead to suboptimal results. As the cost curves almost do not overlap (hydropower installations of the relevant range have production costs between 3.4 and 11 ct/kWh, while past biomass/biogas tenders were awarded at 12.5 ct/kWh and above), biomass/biogas installations would not exert any competitive pressure on hydropower projects, while hydropower projects would probably all outbid biomass projects. The vast majority, if not all hydropower projects would be selected, even if they submit bids higher than real costs given the magnitude of the cost advantage compared to biomass installations. Also, in such a tender, it would not be possible to maintain the distinction contained in the EEG 2021 between modernized hydropower installations of no more than 5 MW and more than 5 MW (only eligible for support on the extended capacity). This would further exacerbate the cost advantage for hydropower installations of more than 5 MW, as they have production costs that can be significantly lower and could lead to windfall profits for those installations.

(313) Germany explained that it has a particular interest to support the remaining project potential in this technology, given its ability to provide a more stable electricity production compared to intermittent sources (see recital (153)).

(314) As to technology specific tenders for hydropower installations, Germany has submitted that tenders would be uncompetitive. As set out in decision SA.45461 (recitals (218) and (219)), the remaining potential for hydropower installations in Germany is limited. Moreover, as set out in recital (153) of this Decision, this is confirmed by the observed project realisation in the past years, which never attained more than 11 installations in a given year, combining new and modernised installations. In light of the submitted data, the Commission agrees that under current market circumstances and characteristics of the hydropower installations and their costs, hydropower tenders in Germany would likely be uncompetitive.

(315) The Commission therefore considers that the exemption from tenders for installations producing electricity from hydropower above 1 MW is in line with paragraph 126 of the EEAG.

3.3.1.4.3.2.3 Biomass/Biogas

(316) The aid scheme organises a separate tender for biomass/biogas installations. It includes however both biomass and biogas installations and both new and existing installations[66].

(317) Germany has submitted that putting biomass and biogas installations in competition with other technologies would lead to suboptimal results. In particular, if faced with wind installations and solar installations, biomass installations would not be able to submit winning bids given the rather high wind and solar potential and their LCOE being (significantly) lower than biomass and biogas LCOE (see section 2.6.2 and the outcomes of past tenders (12.5 ct/kWh and above for biomass/biogas, around 6 ct/kWh for onshore wind and around 5 ct/kWh for solar).

(318) Biomass and biogas installations can, however, make important contributions to grid stability through their ability to offer non intermittent production and their ability to provide flexible production (and thus reduce grid balancing costs).

(319) Given the increasing grid stability issues raised by intermittent wind and solar in Germany, Germany has a particular interest in maintaining its biomass/biogas park, to still expand it if possible and to make it more flexible. The possibility for existing installations to take part in the auctions is closely linked to that objective.

(320) The Commission therefore agrees that, in Germany, auctions in which biomass and biogas installations would compete with wind and solar installations are unlikely to enable the further deployment and the modernisation of biomass/biogas installations.

(321) The Commission therefore concludes that Germany has sufficiently demonstrated that the limitation of the auction to biomass and biogas installations only was justified as per point 126 of the EEAG.

(322) The Commission has also verified that the auction conditions for biomass and biogas installations ensure a competitive bidding process. Point 19(43) of the EEAG defines a competitive bidding process as '*a non-discriminatory process that provides for the participation of a sufficient number of undertakings and where the aid is granted on the basis of either the initial bid submitted by the bidder or a clearing price. In addition, the budget or volume related to the bidding process is a binding constraint leading to the situation where not all bidders can receive aid*'.

(323) The Commission notes in this regard that all past biomass/biogas tenders have been undersubscribed and therefore uncompetitive. Germany submits that the increase in bid caps and the increasing number of existing installations older than 13 years over the coming years will lead to increased tender participation (see recital (95)).

(324) To further ensure competitiveness of tenders, the EEG 2021 introduces a rule where only 80% of submitted bids are awarded, in case there are not sufficient bids to cover the tendered capacity. In light of this, the Commission can conclude

[66] The separate tenders for biomethane installations are covered in the following section.

that tenders will be competitive in the sense that through the application of this rule the volume will constitute a binding constraint (i.e. it is ensured that the volume tendered does not exceed the capacity of the bids), which avoids the risk of undersubscription since not all bids will be awarded.

(325) The tenders are organised by BNetzA, who publishes all relevant information in advance. Selection is based on the reference value, and eligibility criteria are clear and limited in number (they can be summarized as criteria linked to the financial guarantee, to the flexibility requirement and the biomass requirements). They are non-discriminatory, as all eligibility criteria apply in the same way to new and existing installations.

(326) The level of subsidy paid to the beneficiaries of the aid is established via a bidding process whereby successful participants will receive the level of support (premium on top of the electricity market price) for which they bid (pay-as-bid), except for very small existing installations (below 150 kW), for which the pay-as-clear rule applies. In addition, to keep the aid budget limited and in view of the variety of biomass/biogas projects (see recital (102)), maximum bid prices (bid caps) are established (see section 2.6.1.4).

(327) Finally, to avoid that awarded projects are not implemented, project owners have to take commitments to realise or modernise the biomass/biogas project within a specific period (see recitals (98) and (103)).

(328) The Commission notes that all biogas installations selected in the auction will be eligible for a flexibility premium. It is aimed at covering the additional costs resulting from increasing the size of the installation in order to obtain the required flexibility of the installation (see above recital (44)).

(329) The aim of the flexibility premium is on the one hand to help biogas installations to cover the additional costs resulting from increasing the flexibility of the installation and at the same time has been shaped in such a way that it obliges the operator to run the installation in a flexible manner: the flexibility premium has been calculated in such a way that an operator will be able to recoup his production costs and a reasonable profit only if he increases production at peak times and reduces production to a lower base load level outside peak demand times. Moreover, clear flexibility requirements have been laid down in the legislation.

(330) Given that a) this flexibility premium is accessible to all selected biogas installations and is the same per kW/year of installed capacity, b) it is aimed at covering costs that only biogas installations have, c) it has been measured so as to create incentives to run the installations flexibly and flexibility criteria are laid down in the EEG 2021, d) the market premium obtained by biogas installations is limited to 45% of their installed capacity and e) this flexibility premium will necessarily be taken into account by biogas installations in their bids, the Commission concludes that this flexibility premium is unlikely to distort the auction and therefore concludes that it is in line with point 126 of the EEAG.

3.3.1.4.3.2.4 Biomethane

(331) The EEG 2021 creates separate tenders for biomethane[67]. The same considerations as for biomass/biogas (see recitals (316)-(321) above) apply for biomethane.

(332) In addition, as set out in recital (65), Germany has demonstrated that biomethane installations have higher production costs than other biomass/biogas installations and therefore no biomethane installation was awarded in past biomass/biogas tenders. On the other hand, biomethane installations have particular potential for providing flexibility, due to their link to the gas grid.

(333) The Commission therefore agrees with a separate tender for electricity production from biomethane installations in Germany and finds it in line with point 126 of the EEAG.

(334) As regards competitiveness, Germany has submitted that they expect strong competition between new and a significant portion of the existing installations, which will need to modernise after 8-10 years of lifetime (see recital (113)). The Commission therefore agrees that the biomethane tenders comply with the definition of a competitive bidding process as defined in point 19(43) EEAG.

3.3.1.4.3.2.5 Solar PV

(335) The aid scheme organises separate tenders for onshore wind installations and solar installations respectively.

(336) Germany maintains its arguments from case SA.45461 that a joined auction would lead to suboptimal results that cannot be addressed through auction design.

(337) Germany has demonstrated that it is currently facing important grid constraints, with congestion management measures and system integration costs on the increasing trend. This is the result of the conjunction of factors: sharp increase in onshore wind installations in northern Germany in particular, while most consumption intensive centres are located in the south, delays in grid expansion and the shutting down of nuclear power plants in the south of Germany. Those constraints call for a deployment of a mix of technologies.

(338) Given the already high share of intermittent renewable electricity in its energy mix, the fact that most of the future renewable deployment will also be realised through wind and solar energy (see the annual targets under recital (13)), the fact that wind installations tend to run when solar installations are not and conversely, Germany has further demonstrated that it needs to have a balanced wind and solar production. This balance is needed to improve grid stability, limit system integration costs and more generally in order to have a complementary renewable energy mix (see also recital (61)).

(339) Germany has also pointed to the fact that in the past limited joint tenders of onshore wind and solar, only solar installations were awarded.

[67] The present Decision only assesses national tenders for biomethane. As set out in fn 1, Southern quotas and tenders are not part of this Decision.

(340) The Commission therefore concludes that a bidding process open to both onshore wind installations and solar installations would currently lead to a suboptimal result given the network constraints and grid stability issues that Germany is facing, the system integration costs that such bidding process could lead to, and the need to achieve a balanced wind and solar deployment. The bidding process can therefore be conducted separately for onshore wind and solar energy in line with point 126 of the EEAG.

(341) In addition to this, the EEG 2021 introduces separate tenders for solar installations on the ground-based and rooftop solar installations.

(342) As justification, Germany has pointed to the fact that in past joint tenders in Germany for ground-based and rooftop installations, rooftop installations have very rarely been awarded (see recitals (62) and (63)) due to their higher cost, even though deployment figures before tendering show large potential for rooftop installations above 750 kW. Moreover, the number of installations just below the tender threshold of 750 kW has significantly increased since the introduction of tenders.

(343) Moreover, large rooftop PV installations are particularly useful, as they would reduce the pressure on ground-based locations for PV in Germany, which could have other uses.

(344) For the above reasons, the Commission agrees with separate tenders for rooftop and ground-based PV installations in Germany and finds them in line with point 126 of the EEAG.

(345) The Commission has also verified that the auction conditions for solar installations would ensure a competitive bidding process in line with point 19(43) of the EEAG, which is based on clear, transparent and non-discriminatory criteria.

(346) The Commission notes in this regard that Germany has demonstrated that it has sufficient potential to expect each tender category to be competitive (see recitals (88) and (91)).

(347) Moreover, the tenders are organised by BNetzA, who publishes all relevant information in advance. Selection is based on the reference value, and eligibility criteria are clear and limited in number (they can be summarized as criteria linked to the financial guarantee and to the type of land/building on which the installation would be built) and non-discriminatory (see section 2.6.1.2 and 2.6.1.3).

(348) The Commission also considers that for rooftop installations the differentiation criterion (see recital (19)) between tender and administrative remuneration for installations between 300 and 750 kW is strong enough to avoid negative impacts on the tender outcomes (installations geared towards feed-in into the grid do not have a credible administratively remunerated outside option that would risk inciting them to bid above their actual cost in the tenders). Moreover, the inclusion of such installations in tenders will provide valuable insights as to the ability of such smaller installations to effectively compete in a bidding process.

(349) The level of subsidy paid to the beneficiaries of the aid is established via a bidding process whereby successful participants will receive the level of support (premium on top of the electricity market price) for which they bid (pay-as-bid). In addition, to keep the aid budget limited, maximum bid prices (bid caps) are established (see recitals (83) and (92)).

(350) Finally, to avoid that awarded projects are not implemented, project owners have to take commitments to realise the solar PV project within a specific period (see recitals (85) and (93)).

3.3.1.4.3.2.6 Onshore wind

(351) As set out and assessed in recital (335) above, the aid scheme organises a separate tender for onshore wind installations, which the Commission finds in line with point 126 of the EEAG.

(352) The Commission has therefore verified that the auction conditions for onshore wind installations would ensure a competitive bidding process in line with point 19(43) of the EEAG, which is based on clear, transparent and non-discriminatory criteria.

(353) The Commission notes in this regard that onshore wind tenders have been regularly undersubscribed since 2018 and therefore uncompetitive (see recital (69) above).

(354) Germany submits that in particular in 2020, the situation has showed signs of improvement, even though tenders were still generally undersubscribed and that the EEG 2021 introduces further monitoring.

(355) In addition, Germany has introduced a specific mechanism for onshore wind: if there is a risk of undersubscription for a tender, which can be indicated by, inter alia, a limited number of newly granted permits or limited tender participation in the past, BNetzA reduces the tender capacity to keep the tender competitive.

(356) Due to, in particular, the latter, the Commission is of the view that future tenders for onshore wind will be competitive and therefore in line with the requirement of a competitive bidding process whereby the volume tendered does not exceed the capacity of the bids (i.e. the volume is a binding constraint), which avoids undersubscription since not all tender participants will be awarded aid. .

(357) The tenders are organised by BNetzA, who publishes all relevant information in advance. Selection is based on the reference value, and eligibility criteria are clear and limited in number.

(358) The level of subsidy paid to the beneficiaries of the aid is established via a bidding process whereby successful participants will receive the level of support (premium on top of the electricity market price) for which they bid (pay-as-bid), except for citizen onshore wind projects, for which the pay-as-clear rule applies[68].

[68] As set out in recital (78), most advantages for citizen onshore wind projects have been removed due to unintended consequences.

(359) To be eligible, projects must already have reached a certain level of development, but in exchange the financial guarantees to be provided are lower. Participants in the auction do not submit bids based on their true costs but by reference to a modelled 100 % onshore wind farm (Referenzertragsmodel, reference yield model). Once their bids are ranked, selected operators obtain a premium based on a corrected reference value. This methodology advantages operators of sites with lower wind quality, which have an improved probability to receive a tender award despite their higher actual cost. However, as all bidders are subject to the same methodology, as the methodology is set in advance, including a detailed manual on how to determine the wind quality of a given site, as also the correction factor curve is publicly available, the Commission considers that it can conclude that a priori the onshore wind auctions will constitute a competitive bidding process based on clear, transparent and non-discriminatory criteria.

(360) As the reference yield model is an auction model on which there is little experience and that, moreover, due to undersubscription it had a negligible impact on the past onshore wind tenders, its impact on tenders will be examined in the evaluation (see also recital (228)).

(361) Germany exempts from auctions pilot installations described under recital (21) a) and b) above. This exemption is in line with point 127 of the EEAG. The pilot installations described in recital (21) b) correspond to demonstration projects within the meaning of point 19(45) of the EEAG, given that they must represent a significant innovation that goes well beyond the state of the art and that Germany confirmed that they must be projects demonstrating a technology as a first of its kind in the Union. The exemption for pilot installations described under recital (21) a) is also in line with point 127 of the EEAG given that it is limited to an installation of 6 MW and cannot concern more than 2 prototypes. In total, the exemption would concern wind parks of maximum 2 generation units and maximum 12 MW in line with point 127 of the EEAG.

(362) Finally, to avoid that awarded projects are not implemented, project owners have to take commitments to realise the onshore wind project within a specific period (see recital (76)).

3.3.1.4.3.2.7 Innovation tenders

(363) Finally, Germany will also carry out innovation tenders, as described in section 2.6.1.6.

(364) Some design elements of the innovation tenders vary from the dedicated tenders: In particular, they award a fixed premium (instead of a sliding one) and foresee no remuneration at negative prices (instead of up to four hours). All these elements are in line with point 124 of the EEAG.

(365) These tenders have a strong technology neutral element, as installations based on all RES sources, as well as storage, can participate in them. However, they are limited to combinations of installations containing at least one solar PV or onshore wind installation as further explained in recital (116)).

(366) In this regards, the Commission first notes that single RES installations already are eligible for support under tenders or through administratively set premiums and tariffs. Secondly, the Commission also finds that the objective of the

innovation tenders is to support installations providing specific services to the grid (for example, stable or flexible production by linking intermittent RES production with storage or by linking several intermittent RES installations with complementary feed-in profiles). This is particularly important in light of the increasing RES deployment and the high amount of intermittent RES in Germany.

(367) Finally, there will be a test segment of 50 MW for special solar installations in 2022 (see recital (120)). Germany has explained that such installations would not be awarded in the general innovation tenders, as they are more expensive than other eligible installation combinations. On the other hand, they have the particular benefit (similar as rooftop PV installations) to reduce the pressure of solar installations on surfaces, which can have another use; in this case by making dual use of such surfaces possible.

(368) The Commission therefore finds the delimitation of the innovation tenders to be in line with point 126 of the EEAG.

(369) The Commission has also verified that the auction conditions of the innovation tenders would ensure a competitive bidding process in line with point 19(43) of the EEAG, which is based on clear, transparent and non-discriminatory criteria.

(370) First, Germany submits that the future innovation tenders will be competitive, in line with the 2020 innovation tender. Moreover, the rules foresee that only 90% of submitted bids are awarded, in case there are not sufficient bids to cover the tendered capacity. In light of this, the Commission can conclude that tenders will be competitive in the sense that through the application of this rule the volume tendered does not exceed the capacity of the bids (i.e. the volume is a binding constraint), which avoids undersubscription since not all tender participants will be awarded aid.

(371) The tenders are organised by BNetzA, who publishes all relevant information in advance. Selection is based on the fixed premium, and eligibility criteria are clear and limited in number.

(372) The level of subsidy paid to the beneficiaries of the aid is established via a bidding process whereby successful participants will receive the level of support (fixed premium) for which they bid (pay-as-bid).

(373) To avoid that awarded projects are not implemented, project owners have to take commitments to realise the projects within a specific period (see recital (118)).

(374) Finally, due to their novelty and varying features, the innovation tenders will be subject to thorough evaluation (see recital (228)d).

3.3.1.4.3.2.8 Cumulation

(375) For all installations subject to tenders, the aid under the EEG 2017 can be cumulated with investment aid in theory, provided the cumulation of different aid measures and revenues do not exceed the LCOE. As, however, the EEG support allocated through tenders is deemed to cover the LCOE, including a reasonable rate of return, this cumulation will in practice always be excluded, except if the

investment aid is granted to an operator in respect of costs that do not belong to the scope of the tender.

3.3.1.4.3.3 Exemption from competitive bidding

(376) As mentioned above, the following are not subject to a competitive bidding procedure:

a) Sewage and landfill gas installations

b) New biomass/biogas installations below 150 kW

c) Deep geothermal installations

d) Onshore wind installations below 750 kW and pilot onshore wind installations

e) Solar PV installations below 750 kW (except for optional tender participation of rooftop PV installations between 300 and 750 kW)

f) Solar tenant electricity installations (Mieterstrom)

g) Hydropower installations

(377) Germany has provided historical data about the market price in Germany, as well as production costs for reference installations. The production costs were calculated in accordance of the LCOE methodology.

(378) In the case of a feed-in tariff, the tariff will include the market price as well as the aid. It does not take into account any marketing costs as the electricity is not sold directly on the market by the producer.

(379) In the case of the premium, the aid corresponds to a top up calculated as the difference between a reference value and the market price. The reference value is based on the production costs relating to the technology concerned (investment costs, operating costs and marketing costs given that in that scenario, the electricity must be directly sold on the market). The reference market value is calculated differently for dispatchable technologies and for non-dispatchable technologies. While for steerable energies, the average market price is used, for intermittent energies, the reference market value is calculated by reference to the market price that could be obtained at the spot market in the hours where the solar electricity or wind electricity was produced. This ensures that the producer of renewable electricity does not obtain more than the difference between the reference value and the market price he obtained effectively on the market.

(380) As regards onshore wind, the Commission notes that the reference value/tariff will be determined based on the same methodology as for installations subject to tenders and the exact reference value/tariff (for a site with 100 % wind quality) will be established based on the average highest winning bids submitted in the tenders of two years ago. This system implies that the reference value is defined by reference to recent LCOE information and is therefore ensuring that the aid will not exceed the difference between the LCOE and the market price.

(381) Germany has demonstrated that the reference values did not exceed the production costs of the installations concerned. The Commission therefore concludes that the aid complies with point 131(a) of the EEAG.

(382) Germany has detailed the return on capital used to determine production costs. The rate of return has been determined for each technology on market observations. It corresponds to the WACC, i.e. the weighted average costs of capital. It takes into account the typical percentages of equity and loan financing of the projects concerned and has also surveyed the loan rates required by banks and the equity rates required by investors.

(383) Cumulation of operating aid under the EEG 2021 with investment aid is in principle possible. However, as set out in recitals (157) and (158), Germany has instituted a mechanism to ensure that the cumulative aid does not exceed LCOE.

(384) The Commission therefore concludes that those rates qualify as normal rate of return within the meaning of point 131(b) of the EEAG.

(385) Germany has provided detailed calculation of LCOE showing that the aid is granted only until the plant has been fully depreciated. In particular the aid based on the LCOE methodology which is granted for a period of 20 years does not exceed the depreciation of the investment. The Commission therefore concludes that Germany complies with point 131(d) of the EEAG.

(386) The German authorities regularly review the EEG. During this review, production costs are surveyed in detail across the whole of Germany.

(387) In addition, certain feed-in tariffs and reference values are subject to annual decreases that were based on projected reduction of production costs. Also, solar feed-in tariffs and reference values are subject to reductions linked to the evolution of production costs in view of the deployment rate of the technology concerned (so-called *atmender Deckel*).

(388) Finally, Germany has committed to monitor production costs annually so as to verify that the automatic adjustments are adequate and do not lead to overcompensation. If Germany observes that automatic adjustments are not sufficient, it will launch the legislative process to adapt tariffs and reference values.

(389) On the basis of those elements taken together, the Commission is satisfied that the condition of para. 131(c) of the EEAG is fulfilled.

3.3.1.4.3.4 No aid beyond depreciation period

(390) The scheme also complies with EEAG point 129 because subsidies will not be paid beyond the point at which the benefitting plants have been fully depreciated according to normal accounting rules. As mentioned in recital (32), beneficiaries are granted support for a period of 20 years and 10 years for modernised biomass installations, which is below the normal depreciation period of the respective plants. Modernised biomass installations can bid for a follow up premium which can prolong the duration of the aid by maximum 10 years. However, as installations eligible for that follow up premium are only installations that have been modernized, i.e. have renewed the power station, invested into flexibility equipment and adapted to new biomass requirements, this 10 year period mirrors the depreciation period of the additional investments.

3.3.1.4.3.5 Flexibility premium and payment

(391) This premium aims at promoting the production of electricity from biogas on the basis of specific technology that allows for a demand-responsive production. Germany would like to promote the use of this technology in order to improve the system and market integration of the production of RES electricity.

(392) The German Government has shown that while this technology allows for higher revenues given that production is higher at times of higher demand, the additional revenues do not cover the entire additional costs resulting from investing in and using this technology.

(393) As set out in recital (51), Germany has confirmed that the flexibility premium is a reshaping of support, i.e. that the overall support paid out is not higher than what could be expected if regular support was paid out for each kWh produced of the total capacity of the installation. For administratively calculated remuneration, the data provided shows that the remuneration does not cover more than the difference between additional production costs resulting from the flexibility investment and the market price. Also, calculations provided show that Germany has taken into account the higher market price that can be obtained through a flexible use of the installation.

3.3.1.4.3.6 Conclusion on proportionality

(394) Based on the above, the Commission considers that the aid granted to RES installations under the notified measure is proportionate.

3.3.1.5 Distortion of competition and balancing test

(395) The negative effects of the measure on competition and trade must be sufficiently limited, so that the overall balance of the measure is positive. The Court has clarified that in order to assess whether a measure adversely affects trading conditions to an extent contrary to the common interest, the Commission must weigh up the positive effect of the planned aid for the development of the activities that aid is intended to support and the negative effects that the aid may have on the internal market[69].

3.3.1.5.1 Positive effects

(396) On the positive side of the balance, the Commission notes that the scheme can be expected to have a range of positive effects because the eligible activities contribute directly to renewable energy production, and indirectly to environmental protection.

(397) On 24 October 2014, the European Council endorsed a binding EU target of an at least 40% domestic reduction in greenhouse gas emissions by 2030 compared to 1990[70]. The climate ambitions of the Commission were reinforced in 2019 with the European Green Deal Communication, setting an objective of no net

[69] Judgment of 22 September 2020, *Austria v Commission*, C-594/18 P, EU:C:2020:742, paragraph 101.
[70] EUCO 169/14, https://www.consilium.europa.eu/uedocs/cms_data/docs/pressdata/en/ec/145397.pdf.

emissions of greenhouse gases in 2050[71]. Finally, the European Council has in December 2020 adopted the net 55% target for 2030, which sets the ground for the 'fit for 55' legislative proposals scheduled for June 2021[72].

(398) The renewable energy generation technologies eligible for support under the EEG 2021 meet the EEAG definition of 'renewable energy sources' (see points 19(5) and 19(11) of the EEAG).

(399) The Commission therefore concludes that the notified aid scheme for the generation of renewable electricity will not only contribute to the development of that economic activity, but moreover it will do so in a manner that creates incentives for emissions reductions and therefore it has also positive environmental effects.

3.3.1.5.2 Negative effects

(400) On the negative side of the balance, support to the production of renewable electricity can distort competition and trade in the electricity market, as well as between undertakings receiving the support and their competitors in the same sector.

(401) Point 97 of the EEAG explains that, when assessing the negative effects of an aid measure, the Commission assesses the impact on competition between undertakings in the product markets affected and on the location of economic activity. Point 98 adds that, where aid is proportionate, its negative impact is in principle softened. Point 99 explains that the Commission will place great emphasis on the selection process, which should not exclude companies and projects that may compete to address the environmental or energy objective. The selection process should lead to the selection of beneficiaries that can address the objectives using the least amount of aid or in the most cost effective way.

(402) In line with point 97 of the EEAG, the aid scheme is well targeted to the market failure it aims to address (see section 3.3.1.4(a)), so that the risk that the aid will unduly distort competition is limited.

(403) In line with point 98 of the EEAG, since the aid is proportionate (see section 3.3.1.4(c)), the negative impact of the aid on competition and trade is softened.

(404) As explained in sections 2.3 and 2.5, and in line with point 99 of the EEAG, an important part of the aid is attributed through tenders, which are non-discriminatory, transparent and open. As well as supporting a reduction in the costs of achieving the targeted environmental protection objectives, this approach is appropriate to help to ensure possible distortions to competition are minimised.

[71] Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions, The European Green Deal, 11 December 2019, COM 2019 (640).

[72] EUCO 22/20, https://www.consilium.europa.eu/media/47296/1011-12-20-euco-conclusions-en.pdf

3.3.1.5.3 Conclusions on distortion of competition and balancing test

(405) In light of the above, the Commission considers that the aid to generation of electricity from RES as described in section 2 is in line with the relevant provisions of the EEAG. The Commission considers that the negative effects on competition and trade are limited by the use of a competitive bidding process, where possible, and are outweighed by the positive effects of the measure in terms of facilitating the development of an economic activity, and having regard also to the environmental benefit that the promotion of RES brings in comparison with more environmentally-harming technologies in the electricity generation market.

(406) Therefore, the aid at issue facilitates the development of certain economic activities, while not adversely affecting trading conditions to an extent contrary to the common interest, as required by Article 107(3)(c) TFEU.

3.3.2 Aid to producers of electricity from mine gas

(407) Mine gas is a mixture of gases that occurs naturally in coal production sites and contains a high proportion of methane. Mine gas has a high global warming potential when released into the atmosphere. Therefore, supporting mine gas utilization contributes to the efforts to reduce the release of greenhouse gases. Besides climate protection effects, using mine gas to produce electricity leads to primary energy savings, as this gas would otherwise simply be released into the atmosphere and instead of this primary resource another primary resource would be used to produce electricity. These positive effects were already recognised in case SA.38632.

(408) The exploitation of mine gas is not viable without public incentives (see recital (132) above). Germany therefore encourages the utilization of mine gas through market premiums and feed-in tariffs under the EEG 2021. Mine gas installations are exempt from the tender system and instead continue to have the level of funding set by law (see recital (20) above). Germany has also explained that mine gas does not offer expansion potentials. The mine gas volume available is decreasing with the closure of mines.

(409) As the aid for mine gas helps reduce primary energy consumption and helps preserve natural resources, it can increase resource efficiency. Thus, the support to installations producing electricity from mine gas have been assessed under sections 3.2 and 3.5 of the EEAG.

3.3.2.1 Contribution to the development of an economic activity

(410) Pursuant to Article 107(3)(c) TFEU, compatible aid must contribute to the development of an economic activity[73].

(411) The aid measure supports the production of electricity from mine gas. As noted in recital (407) above, without aid, mine gas would be released into the atmosphere

[73] Judgment of 22 September 2020, *Austria v Commission*, C-594/18 P, EU:C:2020:742, paragraphs 20 and 24.

and left unused. Thus, the aid measure contributes to the development of an economic activity, i.e. the electricity production from mine gas.

(412) In view of the above, the Commission considers that the notified aid measure contributes to the development of an economic activity, in particular the production of electricity, as required by Article 107(3)(c) TFEU.

3.3.2.2 Facilitation of an economic activity and incentive effect

(413) State aid has an incentive effect if it incentivises the beneficiary to change its behaviour towards the development of a certain economic activity pursued by the aid and if the change in behaviour would not occur without the aid[74].

(414) As noted above, mine gas would otherwise be unused and simply released into the atmosphere, without aid for using it to produce electricity. In decision SA.38632, the Commission also notes that Germany has shown that the production cost of mine gas installations are above the market price and could therefore not be exploited commercially without aid (see recitals (132) to (134) above).

(415) The Commission therefore concludes that the aid has an incentive effect and facilitates the development of electricity production from mine gas.

3.3.2.3 Compliance with other provisions of EU law

(416) State aid which contravenes provisions or general principles of EU law cannot be declared compatible[75].

(417) As indicated in point 29 of the EEAG, if a State aid measure or the conditions attached to it (including its financing method when it forms an integral part of it) entail a non-severable violation of Union law, the aid cannot be declared compatible with the internal market.

(418) In the field of energy, any levy that has the aim of financing a State aid measure needs to comply in particular with Articles 30 and 110 TFEU. As set out above in recitals (273) to (278), Germany has put in place a mechanism allowing the Commission to conclude that the risk of possible discrimination against producers of other Member States is reduced.

(419) In light of the above, the Commission considers that the notified aid measure does not infringe relevant EU law.

3.3.2.4 The aid is designed in order to limit its effects on competition and trade

3.3.2.4.1 Need for State intervention

(420) Point 153 of the EEAG recognises that market failures of the kind described in point 35 of the EEAG are particularly relevant for resource efficiency. In addition, market failures in that area are not often addressed by other policies and measures and State aid may therefore be necessary.

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74 See point 49 of the EEAG and Judgment of 22 September 2020, *Austria v Commission*, C-594/18 P, EU:C:2020:742.

75 Judgment of 22 September 2020, *Austria v Commission*, C-594/18 P, EU:C:2020:742, paragraph 44.

(421) The Commission already found in section 3.3.3.2 of decision SA.38632 that the price for electricity produced from mine gas does not factor in the environmental benefits of using mine gas for electricity production, and that this was not addressed by other instruments in Germany, other than by the EEG 2014. Germany has confirmed that this is still the case today.

(422) The Commission therefore finds that State aid for the production of electricity from mine gas continues to be needed to achieve the environmental benefits linked with the use of mine gas as an energy source.

3.3.2.4.2 Appropriateness of the aid

(423) Point 40 of the EEAG explains that aid measures must be appropriate and that an aid measure will not be considered compatible with the internal market if the same outcome is achievable through other less distortive policies or aid instruments.

(424) As noted in decision SA.38632, Germany has stated that it cannot envisage another instrument that would be less distortive than the EEG to ensure a stable and reliable basis for investments in the production of electricity from mine gas. The EEG 2021 continues to provide this stability and reliability, given that the production of electricity from mine gas does not offer much expansion potential, and the volume of mine gas available continues to decrease.

(425) The notified aid measure is therefore deemed appropriate.

3.3.2.4.3 Proportionality of the aid

(426) According to point 69 of the EEAG, environmental aid is considered to be proportionate if the aid amount per beneficiary is limited to the minimum needed.

(427) The aid is proportionate in the sense that it is limited to the difference between market price and production costs and does not lead to overcompensation, as the reference value does not cover more than the production costs including a reasonable rate of return (see recitals (130) , (133) and (134)). Based on the above, the Commission considers that the aid granted under the notified measure is proportionate.

3.3.2.5 Distortion of competition and trade and balancing test

(428) The negative effects of the measure on competition and trade must be sufficiently limited, so that the overall balance of the measure is positive. The Court has clarified that in order to assess whether a measure adversely affects trading conditions to an extent contrary to the common interest, the Commission must weigh up the positive effect of the planned aid for the development of the activities that aid is intended to support and the negative effects that the aid may have on the internal market[76].

3.3.2.5.1 Positive effects

(429) On the positive side of the balance, the Commission notes that the aid for electricity production from mine gas has climate protection effects, CO_2

[76] Judgment of 22 September 2020, *Austria v Commission*, C-594/18 P, EU:C:2020:742, paragraph 101.

emissions reductions, and primary energy savings, as noted in recital (414) above and in decision SA.38632.

(430) The Commission therefore concludes that the notified aid measure will not only contribute to the development of the economic activity of producing electricity from mine gas, but also will do so in a manner that creates incentives for emissions reductions and primary energy savings, creating positive environmental effects.

3.3.2.5.2 Negative effects

(431) On the negative side of the balance, the Commission notes that support to the production of electricity from mine gas can distort competition and trade in the electricity market, as well as between undertakings receiving the support and their competitors in the same sector.

(432) Point 97 of the EEAG explains that, when assessing the negative effects of an aid measure, the Commission assesses the impact on competition between undertakings in the product markets affected and on the location of economic activity. Point 98 adds that, where aid is proportionate, its negative impact is in principle softened. Point 99 explains that the Commission will place great emphasis on the selection process, which should not exclude companies and projects that may compete to address the environmental or energy objective. The selection process should lead to the selection of beneficiaries that can address the objectives using the least amount of aid or in the most cost effective way.

(433) In line with point 97 of the EEAG, the aid scheme is well targeted to the market failure it aims to address and the aid concerns only a limited number of installations of declining activity, so that the risk that the aid will unduly distort competition is limited.

(434) In line with point 98 of the EEAG, since the aid is proportionate (see section 3.3.2.4.3), the negative impact of the aid on competition and trade is softened. Moreover, any new installations with a capacity above 100 kW are subject to the obligation to sell their electricity directly on the market, which further softens this impact.

3.3.2.5.3 Conclusions on distortion of competition and balancing test

(435) In light of the above, the Commission considers that the aid for electricity produced from mine gas is in line with the relevant provisions of the EEAG. The Commission considers that the negative effects on competition and trade are limited. Any negative effects are outweighed by the positive effects of the measure in terms of the development of the economic activity of producing electricity from mine gas and, moreover, climate protection, emissions reductions, and primary energy savings.

(436) Therefore, the aid at issue facilitates the development of certain economic activities, while not adversely affecting trading conditions to an extent contrary to the common interest, as required by Article 107(3)(c) TFEU.

3.3.3 EEG surcharge reductions for energy-intensive users

(437) Article 107(3)(c) TFEU provides that the Commission may declare compatible '*aid to facilitate the development of certain economic activities or of certain economic areas, where such aid does not adversely affect trading conditions to an extent contrary to the common interest'*.

(438) In addition, the EEAG stipulate compatibility conditions for aid in the form of reductions in the funding of support for energy from renewable sources in its section 3.7.2. and transitional rules for aid granted to reduce the burden related to funding support for energy from renewable sources in section 3.7.3.

(439) In this section, the Commission will assess whether the design of the aid measure ensures that the positive effect of the aid on the development of the supported economic activity exceeds its potential negative effects on trade and competition. It will also establish whether the specific conditions in sections 3.7.2. and 3.7.3. of the EEAG are complied with.

3.3.3.1 Contribution to the development of an economic activity

(440) In accordance with Article 107(3)(c) TFEU compatible aid under that provision of the Treaty must facilitate the development of certain economic activities.

(441) As outlined in recital (189) above the reduced EEG surcharge is granted to energy-intensive users falling within the scope of list 1 and 2 of Annex 4 of the EEG. List 1 entails the sectors listed also in Annex 3 of the EEAG and list 2 includes the sectors listed in Annex 5 of the EEAG. In addition, list 2 of Annex 4 of the EEG includes the sectors 'forging, pressing, stamping and roll-forming of metal; powder metallurgy' and 'treatment and coating of metals'. The current measure, therefore, targets the facilitation of the development of the economic activity of all these sectors.

3.3.3.2 Facilitation of an economic activity and incentive effect

(442) Point 182 of the EEAG specifies that undertakings particularly affected by the financing costs of renewable energy support could be put at a significant competitive disadvantage. The sectors listed in Annex 3 of the EEAG are identified as those exposed due to their electro-intensity and their exposure to international trade in point 185 of the EEAG. Also undertakings listed in Annex 5 with an electro-intensity of at least 20% have been identified as being particularly exposed in point 186 of the EEAG.

(443) Germany has shown that undertakings with an electro-intensity of at least 20% belonging to the sectors 'forging, pressing, stamping and roll-forming of metal; powder metallurgy' and 'treatment and coating of metals' are subject to a trade intensity of 37.9%. Hence, these sectors can be considered as having a trade intensity of at least 4% at Union level within the meaning of point 186 of the EEAG.

(444) Applying the full EEG surcharge to these sectors, therefore, risks harming the pursuit of their economic activities. Without the measure at hand the full EEG surcharge costs could have lead to a shift of production towards regions outside the EU, to a reduction of the European market share globally, or investments

simply not taking place. The measure, therefore, has an incentive effect and facilitates the development of the economic activity of the eligible sectors in Europe to an extent that would have not happened without the intervention.

3.3.3.3 The aid is designed in order to limit its effects on competition and trade

(445) Whilst the State support granted to the energy-intensive users clearly facilitates the economic development of the sectors concerned and avoids relocations outside the European Union, the aid should not affect competition to an extent contrary to the common interest.

(446) The need, appropriateness and proportionality of a measure minimise the distortions on competition and trade. It, therefore, needs to be assessed in how far the measure fulfils these criteria.

(447) As outlined above, the measure facilitates the economic development of the eligible energy-intensive users. Eligible undertakings would have been put at a competitive disadvantage if they would have had to pay the full EEG surcharge, due to their energy-intensity and trade exposure. A reduction of these electricity costs therefore constitutes a targeted and appropriate measure to alleviate this disadvantage. The measure is also needed, as the eligible companies would otherwise not develop their economic activities to the same extent and risk relocating outside the EU.

(448) The proportionality of a measure further minimises the distortions on competition and trade. Points 188 – 190 of the EEAG provide that aid is proportionate if the beneficiaries pay at least 15 % of the additional costs without reduction. Member States can however further limit the costs resulting from financing aid to renewable energy to 4 % of the gross value added ('GVA') of the undertaking concerned. For undertakings having an electro-intensity of at least 20 %, Member States can limit the surcharge to 0.5 % of the GVA of the undertaking concerned. Finally, when Member States decide to adopt the limitations of respectively 4 % and 0.5 % of GVA, these limitations must apply to all eligible undertakings.

(449) As outlined in recitals (192) *et seq.* above, the EEG surcharge to be paid for the electricity consumed above 1 GWh is in principle 15% of the full EEG surcharge and is further capped at 4% or 0.5% of the gross value added depending on whether or not the undertaking concerned has an electro-intensity of at least 20% or not. Hydrogen undertakings pay 15% of the EEG-surcharge from the first GWh of electricity they consume.

(450) The level of the EEG surcharges paid by the eligible undertakings, therefore respects the limits set in points 188 and 189 of the EEAG.

(451) In addition, under the EEG 2021 the reductions cannot lead to an EEG surcharge lower than 0.1 ct/kWh. For the sectors 'aluminium production', 'lead, zinc and tin production' as well as 'copper production', the reduction may not result in an amount that is lower than 0.05ct/kWh. This minimum surcharge is in line with the point 189 of the EEAG as the EEAG provide only for maximum reductions. Member States can grant less reduction provided the reductions are applied in a non-discriminatory way.

(452) Germany has explained that the difference made between the majority of sectors having to pay at least 0.1 ct/kWh and certain sectors having to pay at least 0.05 ct/kWh is justified by the fact that the sectors 'aluminium production', 'lead, zinc and tin production' as well as 'copper production' are price takers on commodities markets and are not in a position to pass on any additional costs to their customers.

(453) For the calculation of the GVA, the EEG 2021 uses the GVA at factor costs and refers to the arithmetic mean over the most recent last 3 years for which GVA data is available in accordance with Annex 4 of the EEAG. As described under recital (199) above the EEG 2021 contains a specific rule for new undertakings. It corresponds to the rule provided under Footnote 3 of Annex 4 to the EEAG.

(454) For the calculation of the electricity consumption, Germany uses either the standardized consumption or the arithmetic mean over the last three years for which data on electricity consumption is available in accordance with Annex 4 to the EEAG. Finally, for the calculation of the electricity price, the EEG 2021 uses average retail electricity prices, also in line with Annex 4 of the EEAG.

(455) As described at recital (200) undertakings that were eligible before but are not eligible anymore because they do not belong to the sectors listed in Annex 4 to the EEG 2014 or because they belong to list 2 but do not reach 20% of electro-intensity will have to pay 20% of the EEG surcharge. This is in line with point 197 of the EEAG.

3.3.3.4 Distortion of competition and trade and balancing test

3.3.3.4.1 Positive effects

(456) The Commission concludes that the notified aid measure will contribute to the development of the economic activity of the sectors concerned and, whilst such measure allows some specific sectors to benefit from a reduced EEG surcharge and not others, this is based on the electro-intensity and the exposure to international trade of these undertakings.

3.3.3.4.2 Negative effects

(457) As the support provided for by the notified aid measure is granted to alleviate the competitive disadvantage resulting from the undertakings' exposure and the fact that the EEG surcharges are the highest in Europe, the impact on competition and trade is limited. Germany also explained that the fact that undertakings consuming less than 1 GWh are not eligible for the EEG surcharge reduction does not unduly affect competition and trade. The administrative costs for the undertakings concerned (gathering of the relevant information, preparation of the file, verification by an accountant), administrative fee for the submission of the application and cost linked to the energy-efficiency improvement system outweigh the benefits of a reduced EEG surcharge for undertakings consuming less than 2.3 GWh.

(458) Also the differentiated treatment of undertakings belonging to the sectors 'aluminium production', 'lead, zinc and tin production' and 'copper production', as well as hydrogen producing undertakings belonging to the industrial gases

sector is justified due to the fact that these sectors find themselves in a different factual situation, as explained in recital (194) and (195) above.

3.3.3.4.3 Conclusion on distortion of competition and trade and balancing test

(459) The Commission notes that the State support granted to the energy-intensive users in form of reduced EEG surcharges facilitates the economic development of the sectors concerned and avoids relocations outside the European Union. It also finds that the impact on competition and trade has been limited by the fact that the measure is appropriate, necessary and proportionate and that the differentiated treatment of certain undertakings is always based on objective and transparent criteria and do not discriminate between undertakings in similar factual situation.

(460) Therefore, the aid at issue facilitates the development of certain economic activities, while not adversely affecting trading conditions to an extent contrary to the common interest, as required by Article 107(3)(c) TFEU.

3.3.4 Support for shore-side electricity in form of surcharge reductions

(461) The notified aid measure in form of an EEG surcharge reduction to 20% for shore-side electricity ('*Landstrombelieferung*') used by seagoing ships constitutes a measure that facilitates the development of certain economic activities and, at the same time, contributes to environmental protection, as it incentivizes its beneficiaries to invest in shore-side electricity which improves notably the air quality by reducing pollutant emissions from on-board diesel generators used in the maritime transport sector in Germany. Thus, for its compatibility assessment the general compatibility provisions (section 3.2.) of the EEAG apply.

(462) The section 3 of the EEAG identifies several environmental measures for which State aid under certain conditions may be compatible with the internal market under Article 107(3)(c) TFEU. One of these measures is State aid '*for going beyond Union standards*'[77]. The measure is compatible with the TFEU if the following compatibility criteria are met.

3.3.4.1 Contribution to the development of an economic activity

(463) Article 107(3)(c) TFEU provides that the Commission may declare compatible with the internal market '*aid to facilitate the development of certain economic activities or of certain economic areas, where such aid does not adversely affect trading conditions to an extent contrary to the common interest*'. Therefore, to be declared compatible under that provision of the Treaty, aid must first facilitate the development of certain economic activities[78].

(464) Germany has explained that the notified measure in form of limiting the EEG surcharge to 20% for shore-side electricity supports the development of an economic activity in the maritime transport sector, namely it contributes to the development of commercial shipping and, moreover, in a manner that is more compatible with environmental protection considerations (including the fight

[77] EEAG paragraph 1.2.(a).

[78] Judgment of 22 September 2020, *Austria v Commission*, C-594/18 P, EU:C:2020:742, paragraphs 20 and 24.

against climate change), as well as indirectly the activity of operators of shore-side electricity stations.

(465) The Commission therefore considers that the notified scheme will contribute to the development of certain economic activities as required by Article 107(3)(c) TFEU.

3.3.4.2 Facilitation of an economic activity and incentive effect

(466) State aid facilitates the development of the economic activity if it incentivises the beneficiary to change its behaviour towards the development of certain economic activities and provided the change in behaviour would not occur without the aid[79].

(467) Reducing the EEG surcharge for seagoing ships associated with buying shore-side electricity in harbours in Germany will reduce the costs and hence the price of using shore electricity and bring it closer to the costs of using their on-board diesel generators when in port. It is thus expected to induce more shipping operators to make the necessary investments for switching to 'off-board' ways to generate electricity in a more sustainable and less polluting manner. By contrast, without the reduction, no such switch is likely to take place given the high price differential between the shore-side electricity and the electricity generated on-board with diesel generators.

(468) In this context, the Commission notes that with a reduced EEG levy to 20%, shore-side electricity would on average cost between 16.83 ct/kWh and 22.83 ct/kWh (investment costs excluded)[80] and thus, would still be more expensive than on-board power generation (with costs varying between currently around 10.07 ct/kWh and 12.6 ct/kWh[81]). However, Germany explained that this remaining cost difference will not prevent shipping companies from purchasing shore-side electricity, as by doing so, they would have other advantages that are not of a monetary nature, such as a greener image. Germany further explained that shipping companies would be likely to do the power switch to shore-side electricity, in particular if it is renewable electricity, provided that the cost differential with diesel-based electricity is not excessive. The Commission notes that according to the analysis and findings of the German authorities an 80%-reduction in the EEG surcharge would be sufficient to secure the switch.

(469) On this basis, the Commission concludes that the measure has an incentive effect, as it creates sufficiently an attractive alternative to electricity production via on-board diesel generators and thus will help to incentivise sea-going vessel operators to make the transition, hence contributing the development of commercial shipping and, moreover, to a (positive) change of behaviour in terms of environmental protection for the economic activity in the commercial shipping sector. It will also indirectly contribute to the deployment of shore-side electricity in German harbours.

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79 See in that sense points 49 and 144 of the EEAG, as well as Judgment of 22 September 2020, *Austria v Commission*, C-594/18 P, EU:C:2020:742, paragraph 60.

80 See Figures 18 to 21 recital (210) above.

81 See recital (209) above.

3.3.4.3 The aid is designed in order to limit its effects on competition and trade

3.3.4.3.1 Need for State intervention

(470) According to section 3.2.2 (paragraph 34) of the EEAG, a state aid measure must be targeted at a situation where aid can bring about a material improvement that the market alone cannot deliver, as otherwise the aid would amount to covering costs that the company would incur anyway and would only increase its profits and distort competition. In order to demonstrate the necessity of the measure, it must be established that the measure enables the development of an economic activity, which would not have taken place absent the measure, or at least would not have taken place on the same terms.The German authorities have demonstrated the necessity of the aid. First, they have demonstrated that when docking in ports, ships need considerable amounts of electricity, which they usually generate from their on-board auxiliary generators using fossil fuels (diesel) thereby causing significant CO_2 emissions (see e.g., Figures 12, 13 and 17 at recitals (204) and (207) above) as well as local air pollutant emissions (NOx, SOx, PM; see Figures 14 to 16 and 17 at recitals (206) to (207) above). The exhaust gases produced in this process contribute significantly to the impairment of air quality and climatic targets. The German authorities have also demonstrated that the alternative shore-side power supply for ships is considerably more expensive than the electricity generated on board using diesel generators. In this context, the German authorities have informed that the costs per kWh for shore-side electricity in Germany currently cannot compete with the reference costs for running on-board diesel generators (with shore-side electricity with full EEG-levy currently costing between 22.23 ct/kWh and 28.23 ct/kWh[82] and diesel-based on-board electricity with costs varying between 10.07 ct/kWh and 12.6 ct/kWh[83].

(471) Therefore, ship operators would only consider an alternative to diesel if the costs of an alternative energy supply for ships were not much higher than the diesel option. The fact that an alternative electricity supply for ships is not only technically sophisticated, but also requires additional investment on board and expensive infrastructure, makes a need for financial support necessary to incentivise the switch to the more environmental-friendly shore-side electricity.

(472) Based on those elements, the Commission observes that without the EEG surcharge reduction, the shipping companies would not viably consider a power switch.

(473) The Commission further observes that there is no market price for electricity produced on board ships as it is self-generated. However, Germany has submitted several representative examples of electricity costs (see Figures 18 to 21 at recital (210) above). The Commission has verified that those examples would contain all relevant cost items (CAPEX and OPEX, taxes, etc.). Most of the assumptions of the example calculations regarding the number of calls, power and supply hours per call per vessel type (except for the assumption regarding the number of calls

82 See Figures 18 to 21 at recital (210) above.

83 See recital (209) above.

of a cruise ship) are taken from the '*OPS calculation tool*'[84]. Those representative examples show that the costs can vary, depending on several affecting factors[85]. For example, costs of installations at berth for shore-side electricity vary as they depend heavily on the existing infrastructure (installation costs were excluded from the sample calculations, see Figure 20 at recital (210) above). However, even with examples at the lower end of the cost range, costs of diesel-based on-board electricity are significantly lower than shore-side electricity with a full EEG surcharge (see recital (210) above).

(474) In light of the above (recitals (470) to (472)), the Commission therefore considers that the notified scheme is necessary to support the targeted economic activity in a manner that increases environmental protection.

3.3.4.3.2 Appropriateness of the aid scheme

(475) EEAG point 40 explains that aid measures must be appropriate to address the policy objective concerned, and that an aid measure will not be considered compatible with the internal market if the same positive contribution to the common objective is achievable through other less distortive policies or aid instruments.

(476) EEAG point 42 explains that different measures to remedy the same market failure may counteract each other. This is the case where an efficient, market-based mechanism has been put in place to deal specifically with the problem of externalities. An additional support measure to address the same market failure risks undermining the efficiency of the market-based mechanism.

(477) EEAG point 45 explains that environmental aid can be awarded in various forms, but that the Member State should ensure that the aid is awarded in the form that generates the least distortions to trade and competition. In that respect, the Member State is required to demonstrate why other potentially less distortive forms of aid such as repayable advances or direct grants as compared to the reduction of the EEG surcharge are less appropriate.

(478) EEAG point 47 explains that for operating aid, which is the type of aid chosen by the German authorities, the Member State must demonstrate that the aid is appropriate to achieve the objective to which the aid is targeted.

(479) The German authorities explained that the transition to environmentally cleaner electricity is deeply uneconomical. In order to address this type of failure, which is linked to the fact that the already existing EEG surcharge would otherwise fully apply to shore-side electricity facilities, instruments such as repayable advances as well as direct grants are not appropriate to produce the desired effect. In fact, the German authorities have designed the aid instrument in relation to the identified market failure and adapted it also to the specific nature of the EEG surcharge, which is a parafiscal charge that is imposed on electricity only in order to finance the support to the production of renewable electricity. Diesel consumption is not subject to that same parafiscal levy. Thus, the measure involves operating aid limited to reducing the EEG surcharge for shore-side

[84] See https://sustainableworldports.org/wp-content/uploads/OPS-calculation-tool.xls.

[85] See Figure 13 at recital (204) above.

electricity by 80% to 20% of the existing surcharge, thereby partially lifting the additional financial costs on commercial seagoing vessel operators when purchasing clean electricity while docked in ports.

(480) Moreover, due to the specific nature of the market failure, pure investment aid is not the appropriate means to tackle the lack of transition outlined above making targeted and limited operating aid exceptionally appropriate. The Commission notes that the application of the reduction scheme to the existing EEG surcharge is also limited to seagoing ships that are not permanently or long-term berthing at the port (see recital (215) above).

(481) The Commission further notes that granting direct financial injections to various commercial shipping undertakings would constitute a stronger intervention in the market and thus potentially risk far more distortions to trade and competition, than the partial exemption from an existing levy, which would prevent ship operators to transition to a more environmentally friendly power supply.

(482) Therefore, the Commission considers that the type of aid chosen is appropriate to address the observed market failure.

3.3.4.3.3 Proportionality of the aid

(483) According to point 69 of the EEAG, environmental aid is considered to be proportionate if the aid amount per beneficiary is limited to the minimum needed to achieve the targeted environmental protection objective, which is hereby understood as the intended development of economic activities and, moreover, in an environmentally friendly manner.

(484) The Commission notes that Germany provided evidence that the aid is kept to the minimum in line with point 86 EEAG. In light of the above-mentioned cost calculation, the German authorities demonstrated that even with a reduced EEG surcharge, shore power would cost at least 16.83 ct/kWh[86] (investment costs excluded) and thus would still be more expensive than the cost of on-board power generation. (between 10.07 ct/kWh[87] and 12.6 ct/kWh[88]). Reducing the EEG surcharge to 20% is therefore already a very moderate measure, especially since marine fuel used by polluting diesel generators on see going ships is currently (and internationally) exempt from tax, so that apart from fuel consumption only marginal costs for additional engine wear are incurred.

(485) Germany has further confirmed that:

1. According to the Federal Government's findings, the ports currently purchase all renewable electricity - including electricity from demonstrably new plants that are not supported by the Renewable Energy Sources Act (EEG);

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86 See Figure 21 at recital (210) above.

87 See, Bericht Nr.90159-01e, "Realisierbarkeit von Landstromanlagen an den Hamburger Kreuzfahrtterminals HafenCity und Altona". Available at: https://www.hamburg.de/contentblob/3126186/c80e1d9001b98cc58f423bfa38e69184/data/gutachten-landstrom.pdf.

88 DNV GL, 2018, HPA NOX TIER III STUDY, Evaluation of Options for Reduction of In-Port Emissions of Container Ships (not published).

2. Future financial aid granted by the Federal Government to the *Länder* for the construction of shore-side electricity facilities in the years 2020-2024 is linked to the condition that renewable electricity is purchased in the plants[89];
3. Annual monitoring in order to check whether the financial gap (diesel/supported shore-side electricity) still exists and if it disappears to reduce or abolish the EEG surcharge relief respectively.

(486) Further, based on the information provided and according to the explanatory memorandum of the respective national legal basis (EEG), the EEG surcharge reduction is to be abolished as soon as and to the extent that an obligation to use shore-side electricity is introduced by European Union law[90].

(487) The Commission further notes that the measure provides for a number of safeguards to ensure that any aid is limited to the minimum necessary to achieve its objectives. In fact, shore-side electricity facilities will only be eligible facilities if supplying electricity exclusively to seagoing ships temporarily at berth. This should ensure that other parties will not be supplied with the apportioned electricity and that the electricity is used to avoid diesel consumption and related emissions from seagoing ships in ports, and not a levy-privilege for other parties.

(488) In light of the above, the Commission therefore concludes that the support for shore-side electricity is proportionate.

3.3.4.4 Distortion of competition and trade and balancing test

3.3.4.4.1 Positive effects

(489) The notified measure can be expected to have a range of positive effects in facilitating the development of the economic activity of the commercial shipping sector (see recitals (467) and (469) above).

(490) For one thing, the measure will contribute to the development of the aforementioned economic activities[91], while also contributing to a binding EU target[92]: an at least 40% domestic reduction in GHG emissions by 2030 compared to 1990[93], as well as in order to achieve climate neutrality, a 90% reduction in transport emissions needed by 2050.

(491) The measure can be also seen in relation to Directive 2014/94/EU[94] which aims at ensuring the build-up of alternative fuel infrastructure and the implementation of

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89 See Article 4(5): '*A requirement for funding is that the shore power facility. (a) Is suitable to achieve the support objectives referred to in Article 3, (b) supplies electricity from renewable energy sources, if possible from additional generation, to the extent legally and technically possible.*', Verwaltungsvereinbarung Errichtung von Landstromanlagen über die Gewährung von Finanzhilfen des Bundes an die Länder nach Artikel 104b des Grundgesetzes (VV Landstromanlagen).

90 See explanatory memorandum ('*Gesetzesbegründung*') to the amended EEG 2021, to number 97, p.147.

91 See section 3.3.4.1 and 3.3.4.2 at recitals (463) to (469) above.

92 https://www.consilium.europa.eu/uedocs/cms_data/docs/pressdata/en/ec/145397.pdf.

93 Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions: 'The European Green Deal', Brussels, 11.12. 2019 COM(2019) 640 final, p. 11.

94 Directive 2014/94/EU of the European Parliament and of the Council of 22 October 2014 on the deployment of alternative fuels infrastructure, OJ L 307, 28.10.2014, p. 1.

common technical specifications for this infrastructure in the Union. According to Article 4(5) of the Directive, shore-side electricity supply for waterborne ships shall be installed as a priority in ports of TEN-T to the development of alternative fuel infrastructure. Although the respective EEG reduction benefits the shipping companies and does not directly address the shore-side electricity facilities at ports, the measure can still be seen in the context the this Directive which emphasises the advantages of shore-side electricity, albeit from an infrastructure angle. Recital 34 of the Directive, for example, highlights that shore-side electricity facilities can serve maritime transport as clean power supply, in particular in maritime ports where air quality or noise levels are poor and thus can contribute to reducing the environmental impact of sea-going ships.

(492) Moreover, the measure will contribute to the improvement of the environment by reducing emissions of GHG and polluting particles. In doing so, it will contribute to both the climate goals (mitigation of consequences of climate change) and air quality objectives for the protection of human health and the environment set out in the Ambient Air Quality Directive[95]. It will also contribute to the achievement of the policy goals set by the EU in its Clean Transport Policy, i.e., regarding alternative fuels for sustainable mobility in Europe (notably references to electricity at shore-side).

(493) In this regard, Germany has indicated that the local air pollutant emissions (NOx, SOx, PM10, PM2.5) caused by on-board power generation can be completely reduced by using shore power (100% reduction), amounting to an annual avoidance of up to 34.6 tons of NOx (see Figure 14 at recital (206) above), up to 1.18 tons of SOx (see Figure 15 at recital (206) above) and up to 0.52 tons of PM (see Figure 16 at recital (206) above). Noise emissions would also be reduced.

(494) As regards the reduction of CO_2 emissions, the Commission notes that the electricity supplied is normally renewable electricity given that according to the current information of the German authorities, only electricity from RES is used in the already existing larger facilities at the seaports, as shipping companies refuse to purchase 'grey electricity' for their shore power supply. In addition, the German authorities informed that the financial assistance provided by the Federal government to the *Länder* in 2020-2024 for the construction of shore power facilities is conditioned on the purchase of RES electricity at the facilities[96].

(495) The Commission observes that the reduction of the EEG surcharge is however not legally subject to the use of renewable electricity exclusively. The Commission has therefore verified that even in those cases where the electricity would not exclusively be renewable electricity, the use of shore-side electricity would lead to reduced CO_2 emissions. To that end, Germany has demonstrated that the consumption of shore-side electricity leads to a net avoidance of the CO2 emissions otherwise caused by the consumption of diesel. The exact volume of CO_2 emission avoided will then depend on the energy mix used to produce the

[95] Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe, OJ L 152 of 11.6.2008, p.1. The target values are defined in Annexes.

[96] Article 4(5): '*A requirement for funding is that the shore power facility. (a) Is suitable to achieve the support objectives referred to in Article 3, (b) supplies electricity from renewable energy sources, if possible from additional generation, to the extent legally and technically possible.*', Verwaltungsvereinbarung Errichtung von Landstromanlagen über die Gewährung von Finanzhilfen des Bundes an die Länder nach Artikel 104b des Grundgesetzes (VV Landstromanlagen).

electricity used. With the current German energy mix, Germany showed that the savings would on average amount to about 30%, with progressively increasing shares (see Figure 12 at recital (204) above*).*

(496) The German authorities further demonstrated that even at times where the share of renewable energies in the German energy mix is very low (so-called worst-case scenario) and considering that this (very low) share does not occur often during the year, it is shown that the annual emissions due to the purchase of shore-side electricity are still lower than the emissions from on-board electricity generation (see Figure 13 at recital (204) above).

(497) In light of the above, the Commission concludes that the measure will have a positive impact on the environment even if electricity is consumed at those rather few times when the share of renewables in the electricity mix is very low.

(498) The Commission further notes that also geographical factors need to be taken into account when assessing the positive effects of the aid measures. In this context, the German authorities explained that the use of shore-side electricity, i.e., a higher consumption by the shore-side electricity plants of the ports located exclusively in the north of Germany would lead to a reduced need for curtailments of renewable energy plants due to less congested grids. In fact, the shore-side electricity plants for the seagoing ships benefiting from the measure are all located on the German coast, where a particularly large amount of electricity is generated from RES. For instance, in Schleswig-Holstein, more electricity has been generated from renewable energies since 2015 than was consumed during the same period[97]. As long as there are bottlenecks in the German transmission grid, it is therefore beneficial for the system if more electricity is physically consumed in the north.

(499) During grid bottlenecks in northern Germany, onshore renewable energy generation plants are also regularly curtailed. In 2019, for example, 3.351 gigawatt hours ('GWh') of electricity from onshore wind, solar and biomass were curtailed in Schleswig-Holstein, in addition to a curtailment of 399 GWh of offshore wind energy with grid connection[98]. This corresponds to 58% of the total curtailment of electricity throughout Germany (approx. 6.424 GWh) within the context of curtailment. Also, in 2019, a total of 2.8% of the electricity marketed by RES and CHP plants was subject to curtailment.

(500) According to Germany, at the times when feed-in management (i.e. curtailment) measures would take place due to grid congestion, the additional consumption of the seagoing ships could thus contribute to less generated electricity quantities that have to be curtailed and to a higher consumption of renewable electricity.

(501) In light of the above (recitals (488) to (499)), the Commission notes that the respective economic activities (described in recitals (465) to (468) above) are supported in a manner that reduces GHG emissions and thus contribute to environmental protection, in line with the EEAG. In addition, the general objective of environmental aid is to increase the level of environmental protection compared to the level that would be achieved in the absence of the aid. The

97 Information of the Statistical Office North (*Statistikamt Nord*), various years.

98 Quarterly Report of the Federal Network Agency (Bundesnetzagentur), 'Quartalsbericht Netz- und Systemsicherheit - Bericht für das Jahr 2019' (2019).

Commission further notes the positive impact on the network management and on the production of renewable electricity in northern Germany.

(502) The Commission therefore concludes that the measure will not only contribute to the development of the economic activity of commercial shipping, but it also creates an incentive for emission reductions in line with the relevant EU objectives, such as clean transport as well as a net-zero GHG emissions by 2050.

3.3.4.4.2 Negative effects

(503) EEAG point 97 explains that, when assessing the negative effects of an aid measure, the Commission assesses the impact on competition between undertakings in the product markets affected and on the location of economic activity. Point 98 explains that, where aid is proportionate, its negative impact is in principle softened.

(504) The aid in form of a reduced EEG surcharge for shore-side electricity directly affects the product market for the commercial shipping sector.

(505) The implementation of the scheme will thus lead to a situation where some shipping companies will receive the aid, namely those who are eligible, and some will not, namely those who do not qualify for the reduced EEG surcharge.

(506) The aid measure could also distort competition between onshore-side electricity providers and diesel suppliers at harbour berths.

3.3.4.4.3 Conclusions on distortion of competition and balancing test

(507) According to the submissions of the German authorities, the notified measure will have only a limited effect on competition and trade.

(508) As outlined above, the measure is liable to strengthen the competitive position of the commercial shipping companies as opposed to potential competitors. Furthermore, the implementation of the scheme will lead to a situation where some companies will receive the aid in form of a reduced EEG surcharge, namely those who are eligible, and some will not. However, the Commission notes that the distortions on competition remain limited as the reduction is available to any shipping company using a German marine port and is also applicable to any shore-side installation in German maritime harbours (see recital (201) above). In addition, the EEG surcharge reduction does not reduce the operating costs of shipping companies but makes it rather possible for the respective companies to use shore-side electricity instead of diesel at a price that is close to, but still slightly higher than the costs of using diesel (see recital (210) above). Therefore, the measure is designed to limit any distortions of competition as much as possible.

(509) On the positive side of the balance, the Commission notes that the measure will facilitate the development of low emission transport-related activities, i.e. the investments in shore-side electivity for the commercial shipping sector. Moreover, the measure will have positive effects in terms of environmental gains, as it will induce a reduction of pollutant emissions, therefore contributing to climate, noise and air quality objectives (see recitals (204) to (207) above). The

aid has been shown to have an incentive effect, to be necessary to achieve the targeted positive effect, to be appropriate to achieve those positive effect as well as to be limited to the minimum necessary.

(510) In light of the above, the Commission notes that the unavoidable distortions are therefore outweighed by the development of the supported activity and the environmental impact of the measure and remain proportionate to this positive effect. In particular, the EEG surcharge reduction does not render the shore-side electricity cheaper than the diesel it aims to replace but reduces the cost differential to a level at which the shipping companies can viably chose to make the switch.

(511) On this basis, the Commission considers that the scheme is in line with the relevant provisions of the EEAG. The Commission considers that the negative effects on competition and trade are limited by the broad eligibility of the measure, and are thus outweighed by the positive effects for the commercial shipping sector and the broader environmental positive effects of that the aid will bring about (i.e. reduction of GHG emissions as well as local air and noise pollution (see recitals (204), (206) and (493) above).

(512) Therefore, the aid at issue facilitates the development of certain economic activities, while not adversely affecting trading conditions to an extent contrary to the common interest, as required by Article 107(3)(c) TFEU.

3.3.5 Transparency of the aid and firms in difficulty or subject to an outstanding recovery order

(513) According to point 104 of the EEAG, Member States must ensure the transparency of aid granted by publishing certain information on a comprehensive State aid website.

(514) Germany has committed to comply with the transparency requirements in EEAG points 104-106, and indicated that this information is published and can be found on a website.

(515) Germany confirmed that no aid can be granted to undertakings in difficulty and all firms that intend to participate in the scheme will have to provide a declaration that they are not a 'firm in difficulty'. The Commission notes that Germany intend to allow undertakings, which were not in difficulty on 31 December 2019 but became undertakings in difficulty in the period from 1 January 2020 to 30 June 2021 to participate in the scheme, in line with the amended EEAG. The Commission therefore considers that the scheme is in line with point 16 of the EEAG.

(516) Germany has committed that no aid can be granted to undertakings subject to an outstanding recovery order following a previous Commission decision declaring aid illegal and incompatible with the internal market. The Commission therefore considers that the scheme is in line with point 17 of the EEAG.

3.3.6 Evaluation

(517) Point 28 and Chapter 4 of the EEAG state that the Commission may require that certain aid schemes be subject to an evaluation, where the potential distortion of

competition is particularly high, that is to say when the measure may risk significantly restricting or distorting competition if its implementation is not reviewed in due time. Given its objectives, evaluation only applies for aid schemes with large aid budgets, containing novel characteristics or when significant market, technology or regulatory changes are foreseen.

(518) The present scheme fulfils the criteria of being a scheme with a large aid budget (cf. section 2.10) and containing novel characteristics; therefore it will be subject to an ex-post evaluation.

(519) Germany has notified an evaluation plan, setting out the scope and modalities of the ex-post evaluation. The plan is described in section 2.14 above with certain elements, in particular the data and methodologies used, being further described in the following paragraphs. As mentioned in recital (219), the evaluation will be jointly carried out for the EEG 2021 and the modified WindSeeG. Since the modified WindSeeG has been assessed in a separate decision, SA.57610 (2020/N), the evaluation on offshore wind technology is treated in the context of that decision. As a consequence, the parts of the evaluation plan dealing with offshore wind will not be discussed in the context of the current decision.

(520) The Commission considers that the notified evaluation plan contains the necessary elements: the objectives of the aid scheme to be evaluated, the evaluation questions, the result indicators, the envisaged methodology to conduct the evaluation, the data collection requirements, the proposed timing of the evaluation including the date of submission of the final evaluation report, the description of the independent body conducting the evaluation or the criteria that will be used for its selection and the modalities for ensuring the publicity of the evaluation. It comprises a list of evaluation questions with corresponding result indicators.

(521) The Commission notes that the scope of the evaluation is defined in an appropriate way, and adheres to the principles set out in the Commission Staff Working Document on Common methodology for State aid evaluation[99].

(522) Regarding the data on which the evaluation of the EEG 2021 will be based, the Commission welcomes that Germany has improved the data gathering compared to the previous ex post evaluation. The German authorities and the evaluator will have access to (anonymised) bidding data (including data on all submitted bids, such as technology, bidding round, bid price, if applicable, parcel and, if available, Markstammdatenregisternummer, as well as state of implementation for awarded projects). These bidding data can be used in combination with the Marktstammdatenregister ('MaStR'), a universal database of all electricity generation plants in operation in Germany available since 31 January 2019. For reasons of data protection, the evaluation committee has no access to the personal data of the bidders and the analysis has to be carried out using an anonymized bidder ID[100]. A project can be linked to the anonymized tender data provided by

[99] Staff Working Document on Common methodology for State aid evaluation, SWD(2014) 179 final.

[100] A challenge when analysing the data for the evaluation of the EEG 2017 was that the tender data could only be transmitted anonymously by the BNetzA to the evaluation committee. This should prevent specific bidders from being identified. This will also be the case for the tender dates for the EEG 2021 and the modified WindSeeG. However, by creating an anonymous bidder ID, bids from different bidders could still be identified and analysed.

the BNetzA via the postcode, district and the parcel, if it has participated in the tender. Data sources are individually defined for each evaluation question.

(523) The Commission also welcomes the fact that Germany will use data from installations awarded under the EEG 2017, where useful. For example, in order to complement data obtained from the tenders realised under the EEG 2021, additional data points from tenders under the EEG 2017 will be used. This should ensure that sufficient data points are available in order to carry out the proposed regression analysis, which in turn allows for a proper analysis of the causal impact of the aid scheme.

(524) Regarding applied methodologies, as mentioned in section 2.14, the 2019 evaluation report was insufficient, due to, in particular, the failure to identify the causal impact of the aid. In this respect, the Commission welcomes the general commitment by Germany to apply an empirical and where appropriate counterfactual analysis, in order to assess the causal impact of the aid scheme on the behaviour of the beneficiaries. For the assessment of the direct and indirect effects of the aid, 'top-down' and 'bottom-up' approaches, as well as an analysis of the supply curves of individual tenders, are proposed for the evaluation of the EEG 2021.

(525) In the top-down analysis, a counterfactual scenario (market result without aid) is compared with an aid scenario (market result with aid) on the basis of a model about how the market works and reacts.

(526) In the bottom-up analysis, a group of aid recipients (treatment group) is selected on the basis of the tender results of the BNetzA and compared with a control group that has properties that are as similar as possible. Bidders who have not been awarded a contract in the same tender can serve as a control group, provided that the tender was not undersubscribed. The decisive indicator for assessing the effectiveness of the aid is the comparison between the behaviour of the treatment group and the control group. Whether or not an investment in renewable energy technologies has been made can be derived from the MaStR. The methodology proposed by Germany is to carry out a regression analysis ('Regression Discontinuity Design (RDD)' or 'difference-in-difference' analysis).

(527) The Commission welcomes that in addition to the top-down and bottom-up analyses, the supply curves of individual tenders will be analysed in more detail on the basis of the tender data. The slope of the constructed supply curve or curves formed by the bids received in individual tenders allows a comparative static analysis of price and cost effects of an exogenous change in the tender volume. Such analysis is based on the assumption that bidding behaviour does not depend on tender volume, which appears justified if there is a sufficiently high level of competition and the change in the tender volume considered is not too big. Subject to this assumption, supply curves can effectively inform the evaluator on the effectiveness of the aid.

(528) The Commission holds the view that the proposed data and methodologies to assess the direct effect of the aid on the beneficiaries, are based on established ex-post counterfactual or empirical evaluation principles that enable to assess the causal effects of aid. While the top-down analysis will use aggregate data and compare it to a counterfactual derived from modelling, the bottom-up and supply curve analyses will employ data available at project level for both successful and

unsuccessful bids which gives insights into the distribution of outcomes (not only averages).

(529) In addition, the evaluation will also allow assessing the main indirect effect of the aid scheme, namely the cost of abatement (in EUR/tCO_2) of the subsidies for the various renewable energy technologies, a highly relevant parameter for assessing the efficiency of the decarbonisation scheme and for the design of future aid schemes.

(530) The Commission welcomes that the following specific features of the EEG 2021 are assessed (see also recital (228)):

a. Germany will analyse the effect of subsidies in the form of a fixed premium as compared to a variable/sliding premium (which removes the market risk related to volatility in the electricity prices); this will be done by simulating the feed-in of installations which participated in the innovation tenders (fixed premium) with installations in a comparison group that receives a sliding market premium, based on the available bidding data and historical electricity prices, as well as based on data from relevant samples.

b. Germany will analyse the effects of the aid in periods when electricity prices are negative (due to excessive supply or limited demand). The analysis will be based on a sample with three types of installations: (i) installations participating in innovation tenders, receiving a fixed premium and no remuneration for negative prices, (ii) installations receiving a sliding premium and no remuneration at times when prices are negative during at least 4 hours (under the modified EEG scheme, EEG 2021), and (iii) installations receiving a sliding premium and no remuneration at times when prices are negative during at least 6 hours (under the previous EEG scheme, EEG 2017). The feed in by these three types of installations will be compared with the results from '*Direktvermarktungsprojekte*'[101].

c. Regarding biomass projects in particular, Germany will analyse the impact of the incentives provided for in the EEG 2021 for biomass flexibilisation. As explained in recital (42), a flexible installation allows that for a same amount of electricity produced over the year, the major part of the electricity is produced during peak demand hours. The purpose is to see whether biomass plants have made use of this option to become flexible and how it has led to changes in market behaviour. In this respect, Germany will do a comparison between flexible and non-flexible biomass installations.

[101] Since the beginning of 2012, the option of 'direct marketing' within the framework of the EEG has offered producers of renewable energy the possibility of trading the electricity they generate themselves on the market. These producers can directly negotiate with the network operators about the billing and feed-in of their electricity into the power grid, or they can trade the electricity on the energy exchange. See, in particular the chapter on monitoring negative prices: https://www.erneuerbare-energien.de/SiteGlobals/EE/Forms/Listen/Publikationen/Publikationen_Formular.html?queryResultId=null&pageNo=0&oneOfTheseWords=Direktvermarktung.

d. Regarding onshore wind projects in particular, Germany will assess the impact of the reference yield model ('*Referenzertragmodel*') on the outcome of the bidding process for onshore wind tenders (including the impact on participation in tenders, spatial distribution and free-riding), as well as on the level of remuneration and the total cost for the support of onshore wind projects, including system costs (network congestion costs, network development).

(531) The Commission notes that the evaluation will be conducted according to the notified evaluation plan by an independent evaluation body. Moreover, the envisaged publication of the evaluation plan and its results on a public website are adequate to ensure transparency.

(532) The Commission also notes that Germany plans to submit the final evaluation report when it becomes available (at the latest by the end of March 2026) and that an interim evaluation report will be provided in the first half of 2024, which will update the Commission on the progress with data collection and the progress to apply the targeted methodologies mentioned above. In line with the principle of sincere cooperation, Germany commits to swiftly inform the Commission and jointly agree on a possible solution in case the methodologies foreseen in the evaluation plan cannot be applied (e.g. due to lack of data). No future similar scheme can be approved as long as the evaluation is not carried out, in sufficient quality, and its results taken fully into account in the design of any new scheme with similar objective.

(533) The Commission therefore considers that the notified evaluation plan meets the requirements in EEAG point 28 and Chapter 4.

3.3.7 Overall conclusion with regard to the compatibility of the support

(534) The Commission concludes that the aid granted under the above mentioned scheme facilitates the development of an economic activity and does not adversely affect trading conditions to an extent contrary to the common interest. Therefore, the Commission considers the aid compatible with the internal market based on Article 107(3)(c) TFEU and on the relevant provisions of the EEAG.

4. AUTHENTIC LANGUAGE

(535) As mentioned under section 1 above, Germany has accepted to have the decision adopted and notified in English. The authentic language will therefore be English.

5. CONCLUSION

The Commission has accordingly decided not to raise objections to the aid on the grounds that it is compatible with the internal market pursuant to Article 107(3)(c) of the Treaty on the Functioning of the European Union.

The Commission reminds the German authorities that, in accordance with Article 108(3) TFEU, any plans to refinance, alter or change this aid have to be notified to the Commission pursuant to provisions of the Commission Regulation (EC) No 794/2004 implementing Council Regulation (EC) No 659/1999 laying down detailed rules for the application of Article 93 of the EC Treaty (now Article 108 TFEU)[102].

The Commission further reminds Germany that individual aid granted on the basis of the scheme remains subject to the notification obligation pursuant to Article 108(3) of the Treaty if the aid exceeds the notification thresholds of paragraph 20 of the EEAG and is not granted on the basis of a competitive bidding process.

The Commission also reminds Germany that the evaluation report must be submitted by 31 March 2026 at the latest and that this decision is valid until 31 December 2026.

For the Commission

Margrethe VESTAGER
Executive Vice-President

102 OJ L 140, 30.4.2004, p. 1.