



# **State aid for indirect CO<sub>2</sub> costs of emissions trading (electricity price compensation) in Germany for 2018**

**(EPC Report 2018)**

## Editorial information

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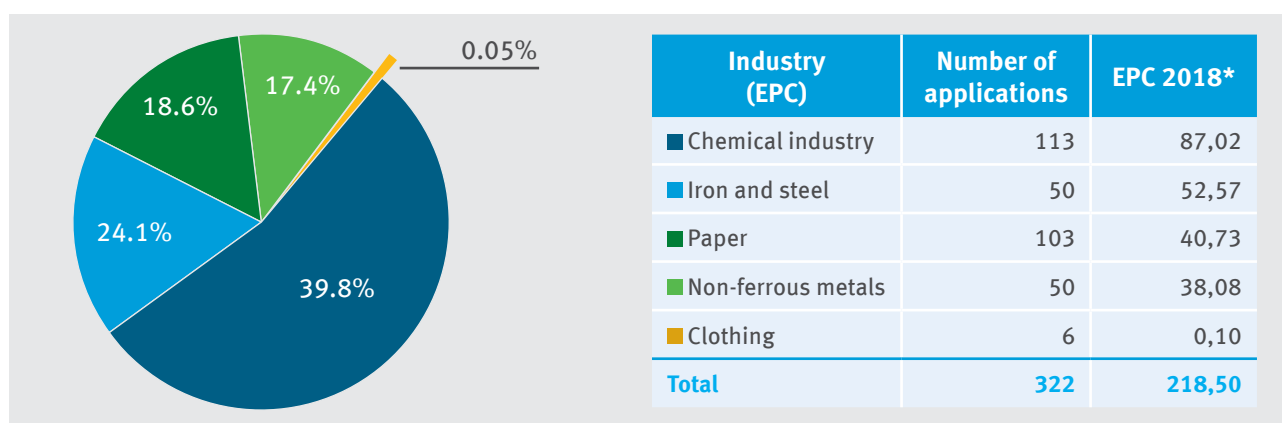
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## Summary

For the 2018 accounting year 326 undertakings submitted state aid applications for indirect CO<sub>2</sub>-costs of emissions trading to the German Emissions Trading Authority at the German Environment Agency. Following verification of the applications, 322 undertakings with 898 installations received around €219 million in aid. The EEA price used to calculate the aid (see explanatory notes in Section 1, p. 5 onwards) amounted to €5.88 which means that the total approved state aid for 2018 amounted to €219 million and is higher than in 2017 (€202 million).

In certain circumstances, the so-called difference carried forward (see explanatory notes in Section 1, p. 5 onwards) was applied to determine the aid amount for the 2018 accounting year, as was the case in the previous accounting years. In 2018, this amounted to around €827,000 (about €291,000 for the 2017 accounting year) and has already been included in the total aid allocation of €219 million. In 2018, 47 undertakings benefited from the difference carried forward due to the production trend and electricity consumption in 72 of their installations.

In 2018, undertakings in the chemical industry received 40 percent share, which was the largest share of the compensation. Undertakings in the iron and steel industry followed with 24 percent, the paper industry with about 19 percent, and the non-ferrous metal industry with approximately 17 percent. The clothing industry had a very small share of the 2018 total compensation with 0.1 percent and just six applications (see Figure 1). The shares of the individual industries have changed only slightly compared to the 2017 accounting year.



\* Prices in million euro  
As of 10/12/2019

**Figure 1: Distribution of state aid for electricity price compensation in 2018 for individual industries**

Of the 898 installations for which aid has been granted, 481 participate in the European Emissions Trading Scheme (EU ETS). Their share of the total state aid is almost 69 percent (see Table 3). Many installations, particularly in the chemical industry do not fall within the scope of the EU ETS while installations in the paper industry as well as the iron and steel industry are largely covered by the EU ETS.

As a basis for the 2018 state aid calculation, product-specific electricity consumption efficiency benchmarks (hereinafter called 'benchmarks') are just as important as the so-called fallback factor: about half of the total state aid results from the manufacture of products for which a benchmark exists and from the manufacture of products where the fallback factor has been applied to their electricity consumption (see explanatory notes in Section 1, p. 5 onwards) in order to determine the aid amount. The largest share of aid for the 2018 accounting year is held by the benchmarks for chlorine (17 percent) and primary aluminium (12 percent), as well as the fallback calculation elements of the sectors 'Manufacture of paper and paperboard'<sup>1</sup> (14 percent) and 'Manufacture of basic iron and steel and of ferro-alloys'<sup>2</sup> (11 percent).

<sup>1</sup> Code 2112 as per NACE Rev. 1.1

<sup>2</sup> Code 2710 as per NACE Rev. 1.1

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# 1 State aid for indirect CO<sub>2</sub> costs of the EU Emissions Trading Scheme

State aid for indirect CO<sub>2</sub> costs due to emissions trading should prevent the risk of carbon leakage to locations outside the geographical scope of the EU Emissions Trading Directive (EHRL)<sup>3</sup>. Indirect CO<sub>2</sub> costs are caused by the fact that electricity generators are passing on the cost of emission allowances to their customers via the electricity price. The state aid is intended to compensate undertakings for some of these costs in certain high electricity usage sectors and subsectors mentioned in Annex II of the EU State Aid Guidelines<sup>4</sup>.

The European Commission has identified the sectors and subsectors in which it has detected a risk of indirect carbon leakage. These sectors include production processes with particularly high electricity usage and are subject to strong international competition (see Table 1)<sup>5</sup>. Thus, the approval of the application depends on the products manufactured by an undertaking. Even if these products are eligible for state aid, the assignment of an undertaking to a particular industry is not decisive for granting the state aid. Since state aid is linked to electricity consumption of installations, it does not matter whether the installations are covered by the emissions trading system or not. The granting of aid is based on the State Aid Directive<sup>6</sup> adopted by the Federal Ministry for Economic Affairs and Energy.

Since the aid is intended to offset part of the indirect CO<sub>2</sub> costs of the previous year, applications can be made in the following year, therefore, applications for the accounting year 2018 could be submitted between 01/03/2019 and 31/05/2019. The May deadline was then used as the final cut-off point.

Annex III of the EU State Aid Guidelines sets out product-specific benchmarks for some of the products eligible for aid. They specify the amount of electricity consumption in megawatt-hours per tonne of product produced in order to calculate the state aid. The aid calculation is therefore based on the tonnes of product produced (see Number 5.2.1 of the State Aid Directive). For products eligible for aid without a benchmark, the aid is based on the electricity consumption for the manufacture of these products (see Number 5.2.2 of the State Aid Directive). However, the electricity consumption is multiplied by a uniform fallback electricity efficiency benchmark factor (hereinafter called fallback factor) which is 0.8.

Products with an identical benchmark manufactured within an installation are grouped together into 'calculation elements' for further calculation. The affiliation to the same sector is decisive for the aggregation of fallback products into calculation elements.

According to the EU State Aid Guidelines and the German State Aid Directive, a total aid amount per applicant is calculated by using these quantities, the emission allowance price to be applied (EUA price)<sup>7</sup>, the CO<sub>2</sub> emission factor (0.76 tonnes of carbon dioxide per megawatt-hour) and the state aid intensity<sup>8</sup>.

3 Article 10a(6), Directive 2003/87/EC of 13/10/2003, as of 25/06/2009 (EC Emissions Trading Directive).

4 European Commission Guidelines on certain State aid measures in the context of the greenhouse gas emission allowance trading scheme post-2012 (Communication 2012/C 158/04, Official Journal of the European Union (OJ. EU) C 158 of 05/06/2012, p. 4), amended by Communication 2012/C 387/06 (OJ. EU C 387 of 15/12/2012, p. 5), as corrected by Communication 2013/C 82/07 (OJ. EU C 82 of 21/03/2013, p. 9).

5 Annex II of the EU State Aid Guidelines.

6 Directive on aid for companies in sectors or subsectors deemed to be exposed to a significant risk of carbon leakage due to EU ETS allowance costs passed on in electricity price (aid for indirect CO<sub>2</sub> costs) of 23/07/2013, official part of the Bundesanzeiger (Federal Gazette AT) 06/08/2013 B2, last amended by the second Amendment of Directive of 21/08/2018, Bundesanzeiger (Federal Gazette AT) 28/08/2017 B1.

7 The EUA price to be applied for an accounting year is determined from the previous year's average of the closing offer price of the reference contract on each trading day. For the 2018 accounting year, this was the ICE futures Europe with delivery in December of 2018 (see Section 5.1 k) of the State Aid Guidelines.

8 The following aid intensities (Ai) set out in the EU State Aid Guidelines under margin No. 26 apply: Ai<sub>2013–2015</sub> = 0.85; Ai<sub>2016–2018</sub> = 0.8; Ai<sub>2019–2020</sub> = 0.75.

The German State Aid Directive for electricity price compensation stipulates that the CO<sub>2</sub> costs for the purchase of one gigawatt-hour of electricity per year per installation are subtracted from the undertaking's total aid amount. This retention is calculated based on the EUA price for 2018 (€5.88) and the CO<sub>2</sub> emission factor of 0.76 tonnes of carbon dioxide per megawatt-hour. This results in a CO<sub>2</sub> retention cost of €4,468.80 per installation for the purchase of one gigawatt-hour of electricity.

In certain circumstances, the term known as 'difference carried forward'<sup>9</sup> applies to determine the amount of aid for the 2018 accounting year. In principle, the aid is determined based on the accounting year data, however, this is limited by the aid which would have resulted based on the baseline data – as a rule the period between 2005 and 2011. If the amount of electricity actually purchased in a previous accounting year exceeded the aid based on the baseline data, the carryover will be credited as a positive balance to the difference account. If the amount of electricity for a later accounting year, in this case 2018, is lower than the amount of electricity based on the baseline data, the aid is increased by the difference carried forward. However, the increase is limited to the aid amount based on the baseline.<sup>10</sup>

Section 2 provides information about the evaluation methods used to compile this report. The results of the 2018 application process are presented and explained in Section 3.

In addition, Section 4 includes an evaluation of electricity price compensation and emissions trading. Sections 5 and 6 evaluate the source of electricity used by undertakings and the total electricity consumption of the respective undertakings or installations. Section 7 explains the results at the level of products used in eligible sectors and undertakings. Section 8 deals with the share of electricity price compensation in the auction proceeds of Germany. Finally Section 9 gives an overview of the electricity price compensation for the 2019 accounting year.

## 2 Evaluation methods

### 2.1 Combining sectors into industries

For a more transparent analysis and presentation, this report combines sectors and subsectors eligible for aid into industries (see Table 1). This enables an unambiguous assignment to industries at a calculation element level (see Section 7). Each calculation element belongs to just one of the sectors and subsectors eligible for aid. At the undertaking level (see Section 3), the assignment usually depends on which sectors have the largest share of the aid amount. The assignment at the undertaking level was subsequently transferred to that undertaking's installations.

<sup>9</sup> Difference carried forward in euro at installation level pursuant to No. 5.2.1(a) and (b) of the State Aid Guidelines in conjunction with No. 1 of the Decree of 27/12/2013.

<sup>10</sup> See DEHSt 2020, Section 3.5 Influence of basic baseline data and difference carried forward on the amount of aid.

**Table 1:** List of sectors and subsectors eligible for aid according to NACE Revision 1.1 (2007) in accordance with the EU State Aid Guidelines (Annex II)

Sectors according to NACE <sup>11</sup> Revision 1.1	Name	Industry
1310	Mining of iron ores	Iron and steel
1430	Mining of chemical and fertiliser minerals	Chemical industry
1711	Spinning of cotton-type fibres	Clothing
1810	Manufacture of leather clothes	
211114	Parts of the industry 'Manufacture of pulp': mechanical pulp	Paper
2112	Manufacture of paper and paperboard	
2413	Manufacture of other inorganic chemicals	Chemical industry
2414	Manufacture of other organic chemicals	
2415	Manufacture of fertilisers and nitrogen compounds	
2416 (Parts)	Parts of the industry 'Manufacture of plastics in primary forms': <ul style="list-style-type: none"> <li>▸ 24161039 Low-density polyethylene (LDPE)</li> <li>▸ 24161035 Linear low-density polyethylene (LLDPE)</li> <li>▸ 4161050 High-density polyethylene (HDPE)</li> <li>▸ 24165130 Polypropylene (PP)</li> <li>▸ 24163010 Polyvinyl chloride (PVC)</li> <li>▸ 24164040 Polycarbonate (PC)</li> </ul>	
2470	Manufacture of man-made fibres	
2710	Manufacture of basic iron and steel and of ferro-alloys	
272210	Parts of the industry 'Manufacture of steel pipes, steel tube fittings': seamless steel pipes	Iron and steel
2742	Aluminium production	Non-ferrous metals
2743	Lead, zinc and tin production	
2744	Copper production	

In Section 4, the installations are apportioned according to whether they are subject to emissions trading or not. The assignment to industries will continue to be based on the method mentioned above and not on assignments that may have originated from emissions trading evaluations.

## 2.2 Assignment of the aid amount at the calculation element level

The aid amount cannot be assigned to individual calculation elements without conversion due to the per-installation retention (see Section 1). The per-installation retention was therefore apportioned to the calculation elements of an installation.

<sup>11</sup> NACE (Nomenclature générale des activités économiques dans les Communautés Européennes) Rev. 1.1 is the Statistical Classification of Economic Activities in the European Community, published together with Commission Regulation (EEC) No. 29/2002 of the Commission of 19/12/2001.

### 3 Results of the 2018 application process

For 2018, applications from 322 companies with 898 facilities were approved. The total amount of aid for 2018 was around €219 million (see Table 2). Few applications were rejected for various reasons such as insolvency proceedings during the accounting period or because the products manufactured were not eligible for aid.

The increase in aid by around €17 million compared to the previous year is mainly due to the higher EUA price for calculating the aid for 2018, which was €5.88 in 2018 compared to €5.40 in 2017. The shares of aid across the individual industries changed only slightly compared to 2017.

**Table 2: Number of approved applications and number of installations according to industries and sum of aid paid in 2018**

Industry (EPC)	Number of applications	Number of installations	EPC 2018*
Chemical industry	113	486	87,019,383.85
Iron and steel	50	156	52,569,901.26
Non-ferrous metals	50	111	38,078,959.92
Paper	103	139	40,725,628.78
Clothing	6	6	101,397.23
<b>Total</b>	<b>322</b>	<b>898</b>	<b>218,495,271.04</b>

\* Prices in euro  
As of 10/12/2019

Table 2 shows the distribution of total aid given to individual industries. The chemical industry continues to have the largest share in the aid amount with about €87 million, a 40 percent share. This is followed by the iron and steel industry with about €53 million, which amounts to a share of 24 percent. The paper industry accounted for about €41 million in 2018. Its 19-percent share is still about the third largest of the total aid. The non-ferrous metal industry received about €38 million in 2018, still about 17 percent of the total aid. The clothing industry received about €101,000 or 0.05 percent, which is a very small proportion of the 2018 electricity price compensation.

Figure 2 shows, the aid amount in each year since 2013 divided into additional differentiated aid categories (bars). The aid category of less than €100,000 per application contains the smallest share of total aid per annum, with the largest share in each year being in the €1 million to €10 million category per application. Secondly, the figure shows the number of applications and undertakings in each of the aid categories since 2013 (lines). The highest application numbers are in the two smallest aid categories, up to €100,000 per application and €100,000 to €1 million per application.



The figure clearly shows the trend of total aid depending on the applicable EUA prices. In 2013, this was relatively high at €7.94; in 2014, €4.68, a significantly lower EUA price, was relevant for calculating the aid amount. It increased again in 2015 and 2016 (2015: €6.17, 2016: €7.80) and subsequently remained at a similar price level for the accounting years 2017 (€5.40) and 2018 (€5.88).

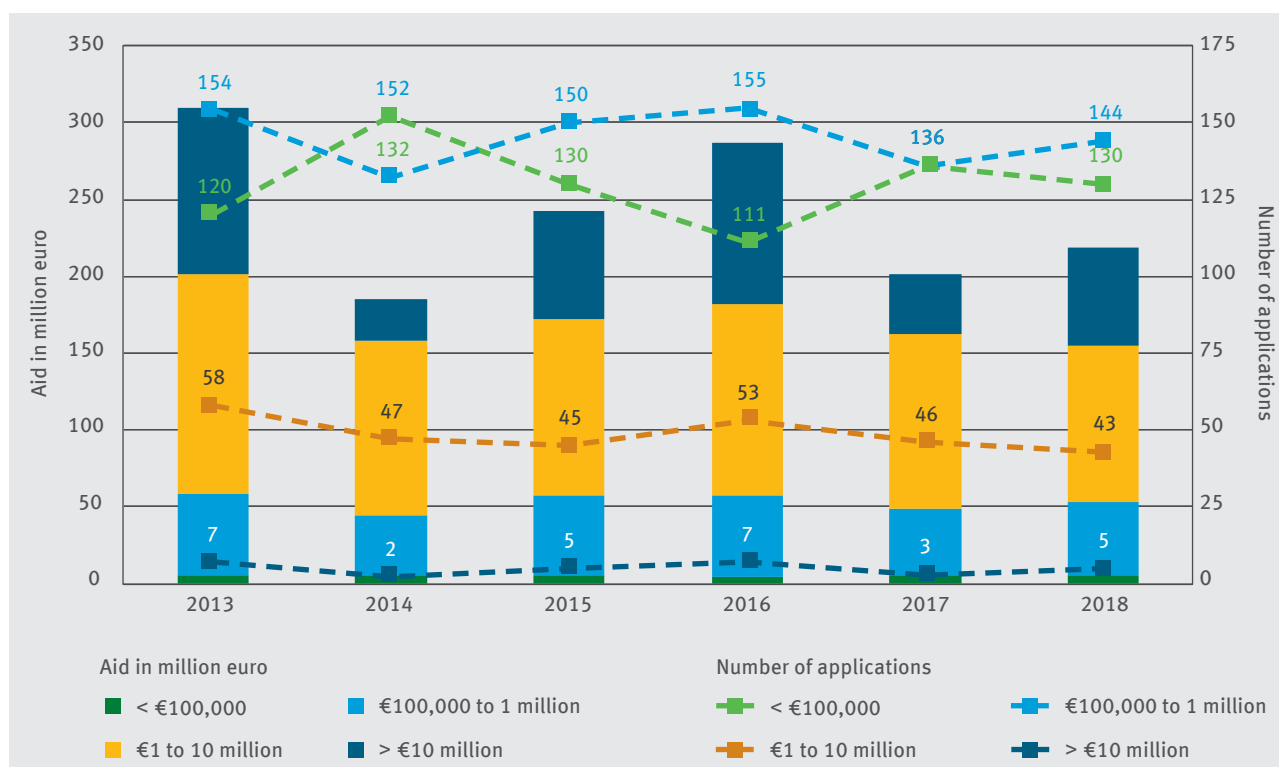
For 2016 and 2017, a lower aid intensity of 0.8 instead of 0.85 applied compared to previous years, which also has an impact on the aid amount.

As a result of these developments, the number of undertakings in the highest aid category (more than €10 million) also reflects the trend of the EUA price: the number of applicants dropped from seven undertakings to two between 2013 and 2014. It then rose again to seven undertakings by 2016 – the same as in the 2013 accounting year, and in 2017 the number of applications fell to three due to the lower EUA price. The reduction in aid intensity in 2017 further exaggerated this effect. Compared to 2017, the number of applications in the highest aid category (more than €10 million) increased again by two, in line with the slight increase in the EUA price compared to 2017. Despite the low number of applications, this aid category has an average total aid amount of €69 million or around 29 percent of the total aid paid.

Even in the smallest aid category, i.e. less than €100,000, the number of applications varies with the change in the appropriate EUA prices (and aid intensity) in each year. The following statement can be made for this category: at high EUA prices, e.g. 2013 with €7.94, the number of applications with 120 undertakings was lower than in years with a comparatively low EUA price, e.g. 152 applications in 2014. This year, aid payments were generally slightly higher than in 2017 so that some applications that were in the aid category below €100,000 in the previous year are now in the category €100,000 to €1 million. In all five years, on average, 40 percent of undertakings received only about two percent of the total amount of aid.

The number of applications in the €100,000 to €1 million category of aid averaging 145 applications per year is the largest compared to other aid categories. Only a small part of the total amount of aid was disbursed in this category with an average of €48 million or 20 percent. In line with fluctuations of EUA prices, i.e. at higher EU prices such as in 2013, a part of the applications moved from the smallest aid category to this category.

After the highest aid category (more than €10 million), the €1 million to €10 million category was the group with the smallest number of applications, i.e. only 49 on average or 15 percent over all previous accounting years. However, this category has the largest share of total aid accounting for 49 percent on average. Variations in the EEA price within the €1 million to €10 million category have only a small impact on the number of applications compared to other categories of aid.



As of 10/12/2019

**Figure 2: Number of applications and total aid according to aid amount per application**

While the total aid of the 2013 to 2018 accounting years has differed significantly according to the fluctuating EUA price (see Figure 2 and Tables 8 to 13 in the Annex), the carbon dioxide amount used to calculate the aid for each of the years amounted on average to 46 million tonnes of CO<sub>2</sub><sup>12</sup>. This means that the high fluctuation of the total aid can be attributed mainly to the volatile EUA price and less to a changed carbon dioxide amount.

Figure 3 (analogous to Figure 2) shows the sum of the CO<sub>2</sub> amount used in the calculation of aid broken down by the CO<sub>2</sub> amount per application category (bars) and the number of applications in each of these categories (lines).

The CO<sub>2</sub> quantity category of less than 10,000 tonnes of carbon dioxide per application covers approximately 26 percent of the applications. At about one percent these applications account for the smallest share of the total amount of CO<sub>2</sub> used for calculating the aid. The category of 10,000 to 100,000 tonnes of carbon dioxide becomes the category with the smallest amount of CO<sub>2</sub>: an average of 6.1 million tonnes of CO<sub>2</sub> per year or 13 percent of the total amount of CO<sub>2</sub> emissions of all applications. With an average of 164 applications per year or 50 percent of the applications, most undertakings are present here.

By contrast, the category of 100,000 to 1 million tonnes of carbon dioxide per application includes 74 applications per year or 22 percent of the total number which is comparatively few. However, the largest share amount can be found here at around 50 percent of the total CO<sub>2</sub>. In the category 1 to 10 million tonnes of carbon dioxide, the number of annual applications has remained unchanged at seven since 2013 (two percent).

Only slight changes can be observed in both the amount of CO<sub>2</sub> and the number of applications in the individual categories over the time.

<sup>12</sup> This value is determined using the disbursed aid sum, the EUA price  $P_t$  to be applied and the aid intensity  $Ait$ : the values for the EUA price result from the provisions of the State Aid Directive, i.e.  $P_{2013} = €7.94$ ,  $P_{2014} = €4.68$ ,  $P_{2015} = €6.17$ ,  $P_{2016} = €7.80$ ,  $P_{2018} = 5.88$ . The aid intensity is also stipulated, i.e.  $Ai_{2013-2015} = 0.85$ ,  $Ai_{2016-2017} = 0.8$ ,  $Ai_{2018} = 0.75$ .

The number of applications in the category less than 10,000 tonnes of CO<sub>2</sub> per application, has significantly dropped over the years from 95 in 2013 to 74 applications in 2018. The amount of CO<sub>2</sub> underlying the aid calculation also fell in this category by 15 percent compared to 2013. In this case, the effort required for preparing an application compared to the disbursed amount of aid and the retention per unit (CO<sub>2</sub> cost for one gigawatt-hour of electricity) may have played a crucial role in the decline of the number of applications.

In the category of 10,000 to 100,000 tonnes of carbon dioxide per application, neither the number of applications nor the quantity of CO<sub>2</sub> on which the aid calculation is based has so far been subject to major fluctuations. Only in 2018 did both the number of applications and the amount of CO<sub>2</sub> increase significantly. Some applications which belonged to the category of less than 10,000 tonnes of carbon dioxide per application in the previous year can now be found in this CO<sub>2</sub> quantity category. However, three applications from undertakings that had not previously applied for subsidies for indirect CO<sub>2</sub> costs of emissions trading have also been added.

An increase in the amount of CO<sub>2</sub> underlying the aid calculation over all previous accounting years, albeit marginally, can only be seen in the category 1 million to 10 million tonnes of carbon dioxide per application. Here, the CO<sub>2</sub> amount increased by around six percent from 16 million tonnes of CO<sub>2</sub> in 2013 to around 17 million tonnes of CO<sub>2</sub> in 2018.



As of 10/12/2019

Figure 3: Number of applications and total CO<sub>2</sub> amount used for the aid calculation, according to CO<sub>2</sub> amount per application

## 4 Electricity price compensation and emissions trading

Of the 322 undertakings that received aid in the 2018 accounting year, 898 installations produced products eligible for aid. More than half of them (481 installations) participate in the emissions trading scheme (see Table 3). In previous years, the share of installations subject to emissions trading eligible for aid was at the same level, with a slight increase in the number of installations subject to emissions trading in the chemical industry compared to 2017. This is mainly due to polymerisation plants being included in emissions trading in Germany in 2018.

In the chemical industry, 271 out of 486 installations (56 percent) are not subject to emissions trading. These installations received 66 percent of the aid in this industry. The reason for this is that many of the electricity-intensive processes do not discharge significant amounts of greenhouse gases and are therefore not subject to emissions trading. In addition, many chemical sites are supplied from centralised power and steam sources to which the emissions trading obligation is limited.

The same applies to the non-ferrous metal industry – about 73 percent of the installations here (81 out of 111) are not included in the emissions trading scheme. These are often installations that have no primary emissions (e. g. cold rolling or pressing plants – i.e. forming plants), or installations that do not achieve the required rated thermal input. However, these installations account for only a twelve percent share of the aid amount available to this industry. This is mainly because the major beneficiaries in the non-ferrous metal industry – the installations for aluminium production through electrolysis – are also subject to emissions trading.

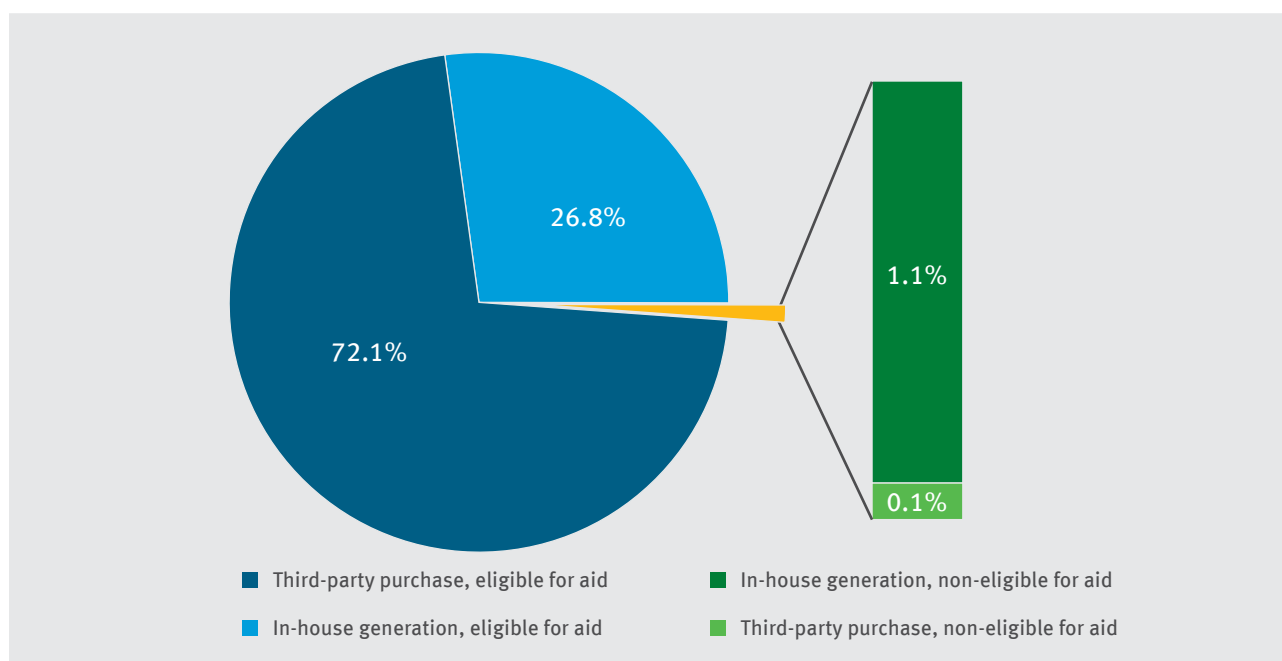
**Table 3: Total number of installations per industry in 2018, showing those subject to emissions trading and those not**

Industry (EPC)	Number of installations	Of which		Share of aid in industry	
		ETS	Non-ETS	ETS	Non-ETS
Chemical industry	486	215	271	34%	66%
Iron and steel	156	107	49	93%	7%
Non-ferrous metals	111	30	81	88%	12%
Paper	139	129	10	95%	5%
Clothing	6	0	6	0%	100%
<b>Total</b>	<b>898</b>	<b>481</b>	<b>417</b>	<b>69%</b>	<b>31%</b>

As of 10/12/2019

## 5 Source of electricity

The basis for calculating aid is a CO<sub>2</sub> emission factor of 0.76 tonnes of CO<sub>2</sub> per megawatt-hour of electricity, which is the same for all German undertakings. When no CO<sub>2</sub> costs are incurred in connection with the electricity consumed, no aid will be granted. This is the case, for example, when undertakings generate their own electricity from installations not subject to emissions trading. Figure 4 shows the share distribution of individual electricity sources in the total electricity consumption of the installations for which electricity price compensation has been granted. Overall, about one percent of total electricity consumption is not eligible for state aid because no relevant connected CO<sub>2</sub> costs have been incurred. About 27 percent of electricity consumed is generated in the undertakings' own installations subject to emissions trading that have received aid. Approximately 72 percent of electricity consumption is electricity eligible for aid generated by other undertakings. According to the applicants, CO<sub>2</sub> costs in the electricity supply contract were explicitly identified for only a small part (5 percent) of the third-party purchased electricity eligible for aid. For a large part, the CO<sub>2</sub> costs associated with eligible electricity purchased by third parties (79 percent), was certified using electricity labelling according to Section 42 of the German Energy Industry Act<sup>13</sup>. In addition, around 14 percent of the third-party purchased eligible electricity stems directly from an electricity exchange, which means that the stock exchange price that usually contains CO<sub>2</sub> costs had already been paid.

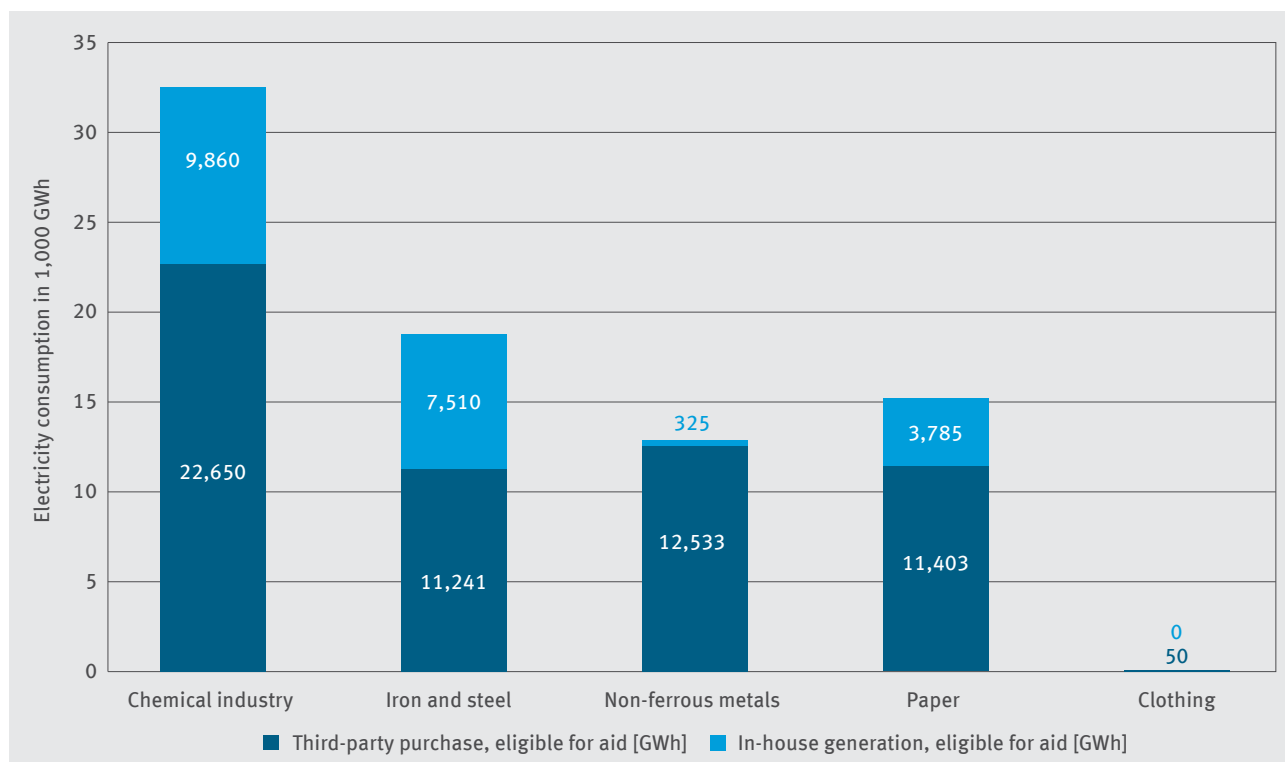


As of 10/12/2019

Figure 4: Source of electricity in 2018

Depending on the industry, the share of in-house-generated electricity in the total electricity consumption varies quite significantly (cf. Figure 5). The clothing industry only purchases electricity from other undertakings (hardly visible in Figure 5 due to the small volume). Hardly any electricity is produced in the non-ferrous metal industry either: only three percent of eligible electricity consumption is generated in-house. The share of in-house generation in the paper industry is about a quarter (25 percent) of the eligible electricity consumption. In the iron and steel industry, in-house-generation makes up 40 percent of eligible electricity consumption. The in-house generated share in the chemical industry is about 30 percent.

<sup>13</sup> This means that it is not exclusively CO<sub>2</sub>-free electricity (nuclear power or renewable energy), but part of the electricity supplied stems from fossil fuels. In this case, the electricity supplied within such an energy supply contract is fully eligible for aid.



As of 10/12/2019

Figure 5: Source of electricity in 2018 of eligible electricity consumption by industry

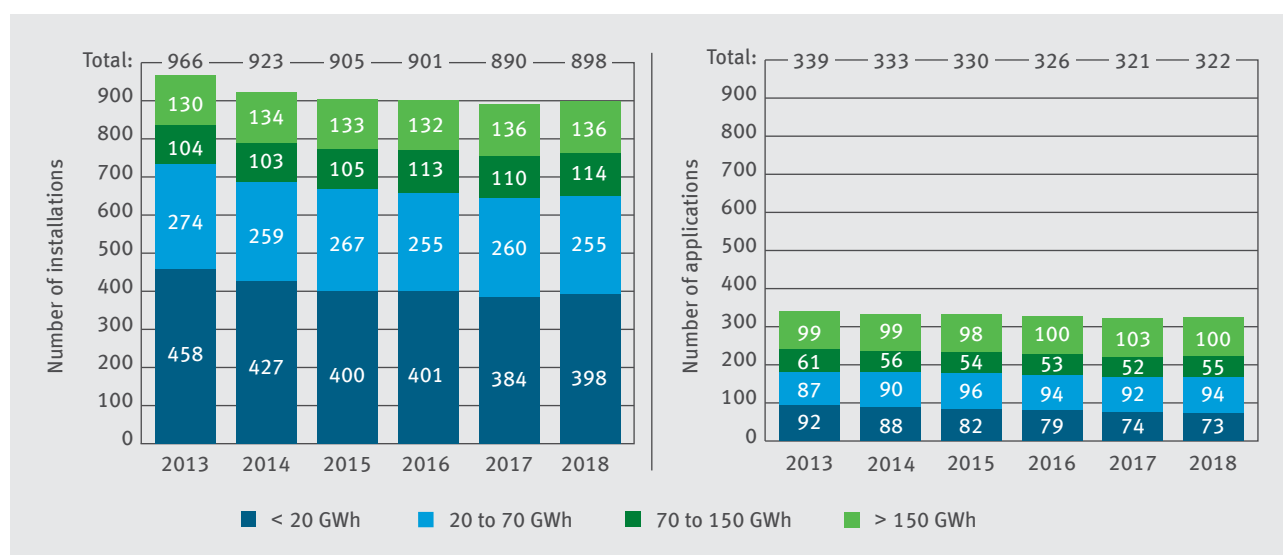
## 6 Electricity consumption

Figure 6 shows the number of installations and applications grouped according to the total electricity consumption of the respective undertakings or installations<sup>14</sup> for each year since 2013. The total electricity consumption is not just based on the eligible electricity consumption but may also contain electricity consumption for the production of non-eligible products. This serves to illustrate the actual size of the undertaking or the installation.

Looking at the entire period from 2013 to 2018, it is noticeable that in total, both the number of applications and the number of installations decreased continuously. This is due to the trend in the smallest category of electricity consumption with less than 20 gigawatt-hours per year, which, with an average of 411 installations and a share of 45 percent, comprises the majority of the eligible facilities. For small-scale consumers, the number of installations dropped from 458 at the beginning to 384 in 2017 and rose again slightly to 393 installations last year while the number of applications in this category continued to decline. The reasons for this may be the effort required in preparing an application compared to the resulting amount of aid and the retention corresponding to the CO<sub>2</sub> costs of one gigawatt-hour electricity.

For large consumers with an electricity consumption of more than 150 gigawatt-hours per year, a slight increase in the number of installations can be observed compared to 2013. The number of applications has shown only very slight fluctuations since 2013.

In the categories 20 to 70 gigawatt-hours and 70 to 150 gigawatt-hours no clear trend can be identified.



As of 10/12/2019

Figure 6: Number of installations and undertakings applying by electricity consumption in 2013 to 2018

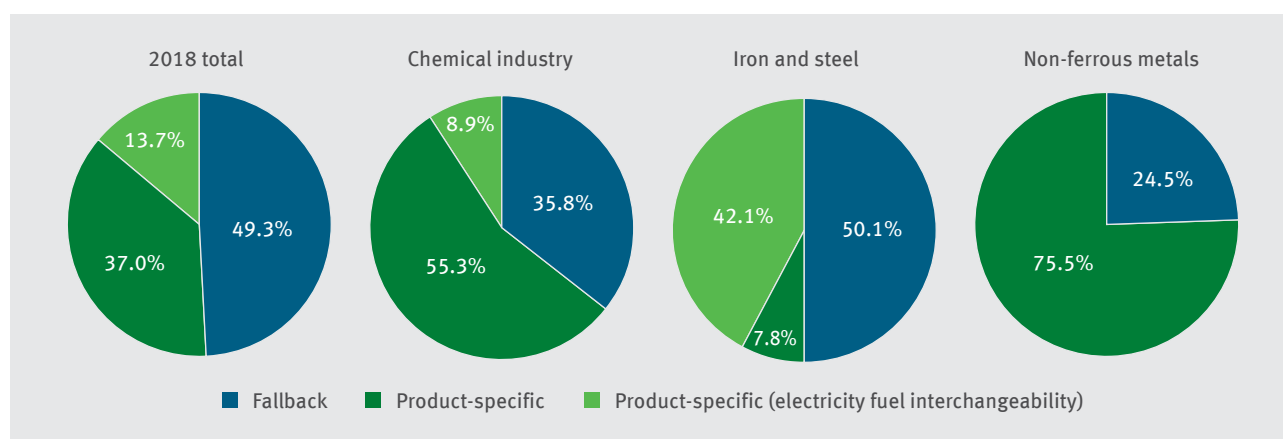
<sup>14</sup> The categories are based on the Eurostat methodology "Energy statistics – electricity prices for domestic and industrial consumers, price components", Section 3.4. Statistical concepts and definitions, New Methodology (from 2007 semester 2 onwards), Industry, Volume IA, IB, IC, ID summarised < 20 GWh, Volume IE 20 to 70 GWh, Volume IF 70 to 150 GWh, Volume IG more than 150 GWh, see [http://ec.europa.eu/eurostat/cache/metadata/DE/nrg\\_pc\\_204\\_esms.htm](http://ec.europa.eu/eurostat/cache/metadata/DE/nrg_pc_204_esms.htm) (last accessed 14/02/2018)

## 7 Results at product level

As described in Section 2, products manufactured within the same installation are combined to form calculation elements for the purpose of calculating aid. The prerequisite for combining various products into one calculation element is an identical benchmark or they must belong to the same sector if they are fallback products. There are 19 product-specific benchmarks and 16 fallback combinations available. Overall, the aid decisions in 2018 were based on about 1,000 calculation elements<sup>15</sup>.

Figure 7 shows the shares for both the fallback approach and benchmark approach in the total amount of aid granted for 2018. Around 51 percent of the total aid was given for the manufacture of products for which a product-specific benchmark applies. The other 49 percent of the total aid was due to product production where the fallback factor was used for electricity consumption to determine the aid amount. The shares of total aid have not changed compared to the 2017 accounting year (see DEHSt 2019).

Depending on the industry these shares are very different. There are no benchmarks in the mining and paper industries, and the aid amount is calculated using the fallback factor. In the non-ferrous metal industry, about 76 percent of the aid amount is determined using benchmarks. This figure is 64 percent in the chemical industry and around 50 percent for iron and steel.



As of 10/12/2019

**Figure 7:** Shares of fallback approach and benchmark approach in the 2018 total aid amount and in aid amounts for selected industries

In the chemical industry and the iron and steel industry, the EU State Aid Guidelines provide compensation based on benchmarks while taking into account the interchangeability of electricity and fuels. Typically, these benchmarks are used in installations that are also subject to emissions trading. If a benchmark product is produced in a fairly electricity-intensive way, the installation receives a higher electricity price compensation. However, if a product is manufactured in a fuel- or heat-intensive way, for example using a large amount of steam, it receives more free allowances. However, benchmarks with interchangeability of electricity and fuels can also be used in cases when the emissions trading obligation does not apply.

In the chemical industry, most of the electricity-intensive products from installations that also participate in emissions trading are produced by using more heat than electricity, meaning that the resulting electricity price compensation is relatively low and the free allowances predominate. Therefore, the share of benchmarks with interchangeability of electricity and fuels in the overall aid amount in the industry is relatively low.

<sup>15</sup> However, there was no application from the '1810 – Leather clothing' sector. The product benchmarks silicon carbide, high-carbon ferromanganese, carbon black and silico manganese were also not applied.



Within the iron and steel industry, electric steel plants in particular benefit from the electricity price compensation for technological reasons. Benchmarks taking into account the interchangeability of electricity and fuel also exist for the production of electrical steel; however, electricity use clearly dominates, even compared to other installations in the iron and steel industry which receive aid. This is reflected in the high share of benchmarks with interchangeability of electricity and fuel in the industry's overall aid amount.

Table 4 shows the shares of the individual product benchmarks in the total aid amount for the 2018 accounting year. Just as in the previous years, the production of chlorine (Cl<sub>2</sub>) has the largest share (around 17 percent), followed by the production of primary aluminium (about 12 percent). Five other benchmarks account for 1.8 to 6 percent of the total aid amount. They include the benchmarks of the iron and steel industry (carbon steel, high-alloy steel, oxygen steel). The remaining eight product benchmarks account for a total of 3.6 percent of the total aid amount for 2018.

**Table 4: Shares of benchmark calculation elements<sup>15</sup> in the 2018 aid amount**

Product benchmark	Share of EPC 2018
Chlorine (Cl <sub>2</sub> )	16.5%
Primary aluminium	11.8%
EAF (electrical arc furnace) carbon steel	6.0%
Hyperpure polysilicon	4.9%
EAF high-alloy steel	4.1%
Highly refined chemicals	1.9%
Oxygen steel	1.8%
Other eight benchmarks	3.6%
<b>Total</b>	<b>50.7%</b>

As of 10/12/2019

Table 5 shows the shares of fallback calculation elements in the aid. The largest shares are held by the sectors ‘2112 – Manufacture of paper and paperboard’ (14 percent) and ‘2710 – Manufacture of basic iron and steel and of ferro-alloys’ (about 11 percent). Seven other sectors and subsectors have shares of between 1.7 and 5.6 percent of the aid. The remaining six sectors and subsectors account for 3 percent of the total aid. Once again, there were no significant changes in the ranking of the individual shares in the total aid.

**Table 5: Shares of fallback calculation elements<sup>15</sup> in the 2018 aid amount**

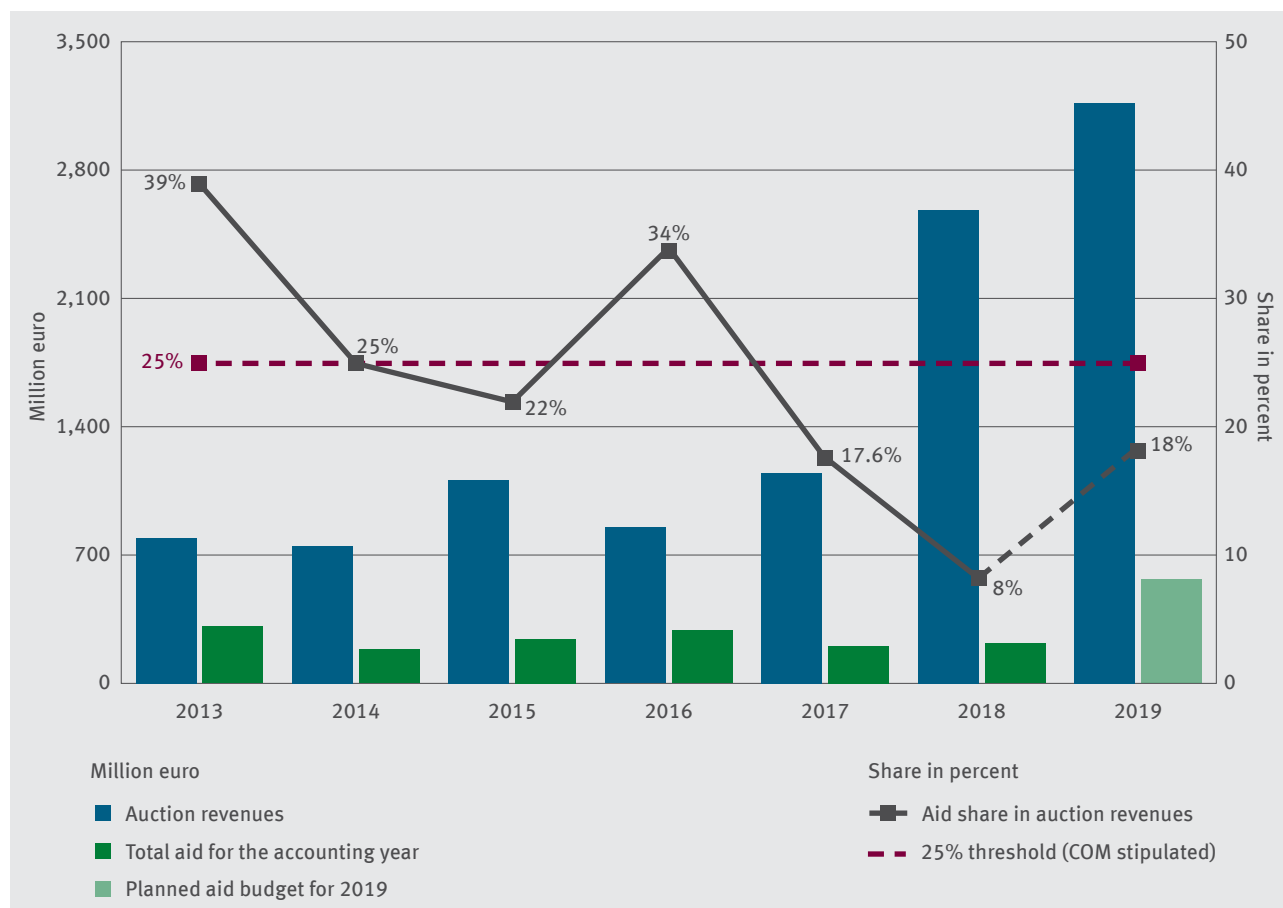
Fallback calculation element		Share of EPC 2018
Fallback 2112	Manufacture of paper and paperboard	14.3%
Fallback 2710	Manufacture of basic iron and steel and of ferro-alloys	10.6%
Fallback 2414	Manufacture of other organic basic chemicals	5.6%
Fallback 2111 (subsector)	Mechanical pulp	4.4%
Fallback 2416 (subsector)	Manufacture of plastics in primary forms	2.9%
Fallback 2413	Manufacture of other inorganic basic chemicals	2.6%
Fallback 2744	Copper production	2.2%
Fallback 2742	Aluminium production	1.9%
Fallback 2415	Manufacture of fertilisers and nitrogen compounds	1.7%
Other six sectors and subsectors (fallback)		3.2%
<b>Total</b>		<b>49.3%</b>

As of 10/12/2019

## 8 Share of electricity price compensation in auction revenues

According to Article 10a(6), the Emissions Trading Directive as amended in 2018 and even before the start of the fourth trading period, specifies that the available amount should not exceed 25% of the auction revenues of the Member State concerned. Otherwise, the Member State must justify why the share of the aid in the auction revenues exceeds this threshold. According to the European Commission<sup>16</sup>, the share is calculated as the ratio of the aid for a given reporting year to the auction revenues of the same reporting year.

Since applications for electricity price compensation in Germany are subsequently submitted and granted, this means for this report that the reported aid for 2018 (accounting year) was applied for and granted in 2019 but was booked together with the 2018 auction revenues when determining the shares.



As of 13/12/2019

**Figure 8:** Disbursed aid in the accounting year (for 2019: estimated budget), auction revenues (EUA and aEUA) of the respective year and respective share since 2013

Figure 8 shows both the aid disbursed for the 2013–2018 accounting years and the auction revenues of the same years as bars and the share of the annual aid disbursed in the auction revenues as lines. This share should be less than 25 percent, however the figure shows that this was not the case in 2013, 2014 and 2016. In 2013 and 2016, the share was 39 and 34 percent, respectively, in some cases well above the 25 percent threshold. In 2014 the threshold was hit. For 2015, 2017 and 2018, the share was clearly below the 25 percent threshold and will also fall below it for 2019, with expected 18 percent.

<sup>16</sup> Cf. KOM 2019, Table 4, page 22.

## What causes the shares of disbursed aid to vary in the auction revenues?

The amount of annual aid disbursed mainly depends on two factors: firstly, the aid intensity, which was highest in 2013-2015 with 85 percent of the volume of electricity eligible for compensation, then 80 percent for 2016 to 2018 and it will drop to 75 percent in 2019 and 2020. Secondly, the relevant EUA price. For electricity price compensation, this is determined based on the respective previous year's average of the daily settlement prices of the exchange-traded reference contract for European emission allowances. For all accounting years, this was the futures contract traded on the ICE in London with delivery in December of the following year.<sup>17</sup> Thus, the maturity of the reference contract corresponds to the electricity price compensation accounting year. Nevertheless, it has been shown that futures can only limitedly reflect the actual price trend in the maturity year (see below). The reference prices are shown in Table 6.

**Table 6: EUA price relevant to aid calculation and aids disbursed since 2013**

Year	2013	2014	2015	2016	2017	2018	2019
EUA price (EPC calculation basis)*	7.94	4.68	6.17	7.80	5.40	5.88	16.15
EPC (aid disbursed)**	310.00	185.16	243.11	287.91	202.21	218.50	

\* Prices in euro

\*\* Prices in million euro

As of 13/12/2019

Another possible factor with relevance to the aid amount is the quantity of CO<sub>2</sub> underlying the aid calculation (as a product of the relevant amount of electricity and emission factor), which has remained approximately the same since 2013 (cf. Figure 3 and the accompanying text) and thus does not play a role in variations of the aid share in the auction revenues.

The volume of the auction proceeds depends on the auctioned quantity and the prices obtained. German auction volumes – as well as those of other Member States – have been falling as planned since 2013 in line with the declining cap. However, due to the so-called backloading, there was an unscheduled significant reduction in 2014–2016 – a total of 900 million EUA<sup>18</sup> across Europe – in order to stabilise the price level. These auction volumes should have been returned to the market in 2019 and 2020 but have now been transferred to the Market Stability Reserve (MSR). Since the MSR entered into force in the beginning of 2019, the EUA volume to be auctioned has been reduced in line with the MSR mechanism. Figure 9 shows the trend of the EUA price level since 2013. Between the beginning of 2013 and the end of 2017, the EUA price initially fluctuated within an interval of about three to eight euros. The price has increased significantly since the beginning of 2018 with the benchmark contract (ICE EUA Front December) reaching its highest level at just under €30 since 2006 in mid-2019 (see Figure 9).

<sup>17</sup> See 5.1 k of the State Aid Directive.

<sup>18</sup> Germany accounted for about 175 million allowances.



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Figure 9: EUA price trend since 2013

Table 7 shows the annual values (volume-weighted average) achieved by German auction revenues.

Table 7: Volume-weighted annual average EUA price of German auctions (excluding aviation)

Year	2013	2014	2015	2016	2017	2018	2019
EUA price (German auctions)*	4.33	5.90	7.60	5.26	5.80	14.90	24.66

\*Prices in euro  
As of 09/01/2019

EPC price and auction price are clearly drifting apart (see Table 8). The relevant calculation price for electricity compensation is determined from the average of the futures price in the previous year, so that there is a one-year delay between the relevant pricing for electricity price compensation and that for auction revenues. Certain market trends are thus not yet reflected in the price relevant to aid calculation. If the prices for aid calculation and from auctions were identical, the share of the aid in the German auction revenues would be between 19 and 31 percent in the 2013–2019 period. If one were to take a hypothetical account of the EUA quantities not auctioned between 2014 and 2016 (backloading) and in 2019 (MSR) in calculating the auction revenues, the share would be between 16 and 22 percent (see Table 8). By default, this adjusted calculation approach also includes the reductions in the auction quantities at the beginning of 2019 equalling the withdrawn volume for the MSR in the following years.

Table 8: Shares of the aid disbursed in the auctioning revenues according to different calculation methods

Year	2013	2014	2015	2016	2017	2018	2019
Regular (see Figure 8)	39.2%	24.7%	21.9%	33.9%	17.6%	8.9%	17.9%
Identical EUA price	21.4%	31.1%	27.0%	22.8%	19.0%	21.5%	27.4%
Identical EUA price, without backloading	21.4%	19.3%	19.3%	18.4%	19.0%	21.5%	16.4%

As of 31/12/2019

## 9 Outlook

A budget of €230 million for electricity price compensation was available in the 2018 accounting year under the Energy and Climate Fund. As in 2017, more than 96 percent of this budget has been exhausted without budgetary reductions in total state aid being necessary.

The application process for the 2019 accounting year began on 01/03/2020. Operators can submit applications by 02/06/2020. The EUA price to be applied in the aid calculation for the 2019 accounting year is €16.15. It is thus 175 percent higher than the 2018 price and will lead to an increase in the overall level of total state aid. The Federal Ministry for Economic Affairs and Energy therefore provided €567 million for the 2019 accounting year.

In addition, the European Commission is currently revising the European legal basis for electricity price compensation, i.e. the State Aid Guidelines. This is necessary because the currently applicable State Aid Guidelines only regulate the compensation of indirect CO<sub>2</sub> costs of the EU ETS, until and including, the accounting year 2020. In January 2020, a draft was published on which the public could comment in a consultation procedure until 10/03/2020.<sup>19</sup> It is planned to adopt the new State Aid Guidelines during 2020.

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<sup>19</sup> European Commission, Public consultation on draft ETS guidelines: [https://ec.europa.eu/competition/consultations/2020\\_ets\\_stateaid\\_guidelines/index\\_en.html](https://ec.europa.eu/competition/consultations/2020_ets_stateaid_guidelines/index_en.html) (accessed on 06/02/2020).

## 10 Annex

The 2013–2017 figures published in the report may differ from previous publications due to retrospective amendments to aid payments because of legal actions such as appeals, lawsuits and reclamations.

**Table 9:** Number of approved applications and number of installations by industries and total aid disbursed in 2013

Industry (EPC)	No. of applications	No. of installations	EPC 2013 *
Chemical industry	118	534	118,635,562.67
Iron and steel	54	164	76,584,699.70
Non-ferrous metals	49	113	51,421,161.76
Paper	111	147	63,028,256.58
Clothing	8	8	294,916.01
<b>Total</b>	<b>340</b>	<b>966</b>	<b>309,964,596.72</b>

\* Prices in euro  
As of 10/12/2019

**Table 10:** Number of approved applications and number of installations by industries and total aid disbursed in 2014

Industry (EPC)	No. of applications	No. of installations	EPC 2014 *
Chemical industry	115	498	72,772,616.17
Iron and steel	52	159	45,135,489.09
Non-ferrous metals	49	113	31,706,259.93
Paper	110	146	35,167,223.57
Clothing	8	8	112,527.51
<b>Total</b>	<b>334</b>	<b>924</b>	<b>184,894,116.27</b>

\* Prices in euro  
As of 10/12/2019

**Table 11:** Number of approved applications and number of installations by industries and total aid disbursed in 2015

Industry (EPC)	No. of applications	No. of installations	EPC 2015 *
Chemical industry	117	486	95,747,985.17
Iron and steel	51	160	58,605,253.79
Non-ferrous metals	47	109	42,217,586.52
Paper	107	142	46,157,796.95
Clothing	8	8	152,301.63
<b>Total</b>	<b>330</b>	<b>905</b>	<b>242,880,924.06</b>

\* Prices in euro  
As of 10/12/2019

**Table 12: Number of approved applications and number of installations by industries and total aid disbursed in 2016**

Industry (EPC)	No. of applications	No. of installations	EPC 2016 *
Chemical industry	113	485	114,010,707.43
Iron and steel	50	160	68,384,214.59
Non-ferrous metals	48	106	50,566,681.55
Paper	107	142	54,182,766.43
Clothing	8	8	168,054.73
<b>Total</b>	<b>326</b>	<b>901</b>	<b>287,312,424.73</b>

\* Prices in euro  
As of 10/12/2019

**Table 13: Number of approved applications and number of installations by industries and total aid disbursed in 2017**

Industry (EPC)	No. of applications	No. of installations	EPC 2017 *
Chemical industry	113	484	80,685,404.68
Iron and steel	50	155	48,821,588.01
Non-ferrous metals	47	105	35,028,466.02
Paper	104	138	36,962,447.49
Clothing	8	8	117,901.97
<b>Total</b>	<b>322</b>	<b>890</b>	<b>201,615,808.17</b>

\* Prices in euro  
As of 10/12/2019

**Table 14: Number of approved applications and number of installations by industries and total aid disbursed in 2018**

Industry (EPC)	No. of applications	No. of installations	EPC 2018 *
Chemical industry	113	486	87,019,383.85
Iron and steel	50	156	52,569,901.26
Non-ferrous metals	50	111	38,078,959.92
Paper	103	139	40,725,628.78
Clothing	6	6	101,397.23
<b>Total</b>	<b>322</b>	<b>898</b>	<b>218,495,271.04</b>

\* Prices in euro  
As of 10/12/2019



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