

Short analysis of the increase of the German EEG surcharge for 2013

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In the German power sector the key support instrument for the expansion of renewable energies is the German Renewable Energy Sources Act (Erneuerbare-Energien-Gesetz, EEG). The EEG promotes power generation from renewable energies on the basis of the merit order, purchase guarantee and remuneration with fixed prices. The electricity quantities fed in via the EEG are chiefly sold by transmission network operators on the spot market. The differential costs between the guaranteed remuneration payments made to the plant operators and the revenues on electricity market are passed through to the so-called privileged and non-privileged power consumers based on different rates.

On 15 October 2012 the transmission network operators published the German EEG surcharge for 2013¹. It amounts to 5.277 ct/kWh for non-privileged consumption, which is 1.68 ct/kWh higher than the surcharge for 2012 (3.59 ct/kWh)².

In this short analysis the contributions of the different factors influencing the increase in the German EEG surcharge compared to the previous year are quantified.

The German EEG surcharge is derived from a number of parameters, above all from the quantities of renewable feed-in, the developments of the remuneration rates, the level of the revenues attainable on the spot market, the level of total final consumption, the scope of privileging under the EEG and a whole number of other factors like forecast errors of the year before, financial management, other special rules, etc. For multifactorial problems requiring explanation such as this one, the order of the influencing factors taken into account in a sequential analysis (in which one factor is layered on after another) plays a substantial and sometimes an overriding role in the quantification of the factors at hand. As a result so-called decomposition analysis has been used for this assessment; for a more detailed description of this methodology, please refer to (Öko-Institut 2012).

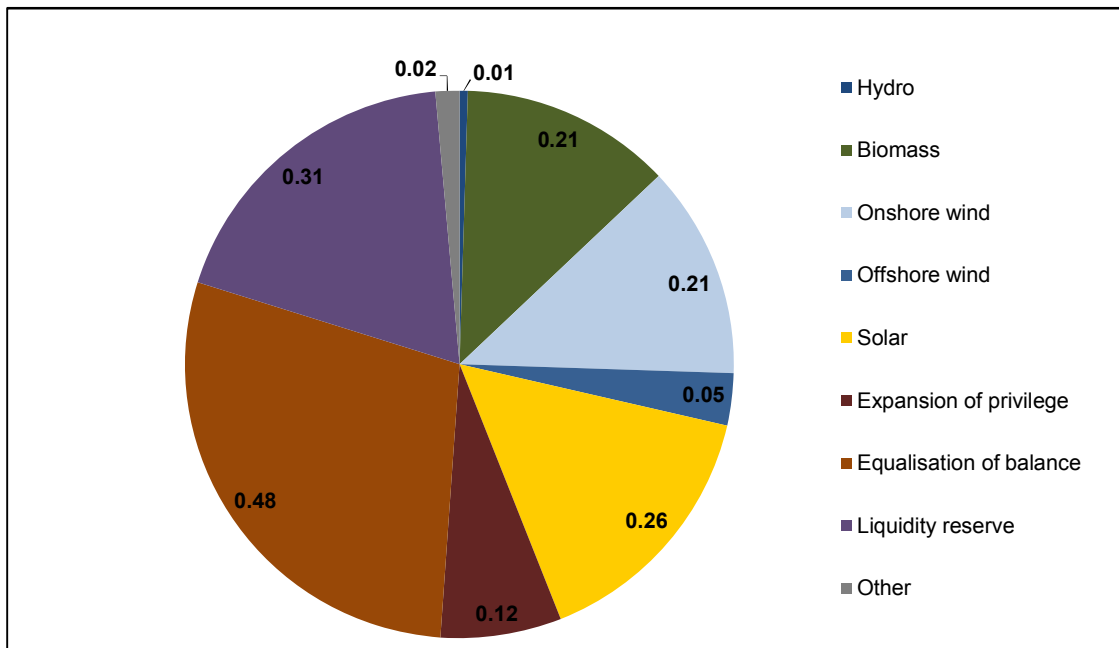
The contributions of the most important factors influencing the increase in the EEG surcharge which arise from the analysis are shown in Figure 1. Overall it can be observed that:

- The additional **expansion of renewable energies** leads to an increase in the EEG surcharge in 2013 totalling 0.74 ct/kWh overall, which corresponds to 44% of the surcharge increase compared to 2012.
- In terms of renewable energies, the largest contribution is made by **photovoltaics**, amounting to 0.26 ct/kWh (15% of the increase).

¹ (German transmission network operators, 2012b).

² (German transmission network operators, 2011).

Figure 1 Contributions of the most important factors influencing the increase of the German EEG surcharge in 2013 compared to 2012 (1.68 ct/kWh overall)



Source: Calculations by Oeko-Institut

- The second largest component of the increase is power generation from **biomass** and **onshore wind** power plants, which each contribute 0.21 ct/kWh (12.5%) to the increase in the EEG surcharge.
- Equalisation of the current **negative balance** of the German EEG account constitutes the largest component of the increase (0.48 ct/kWh or 29%); the account stood at minus € 2.59 billion in September 2012. This derives from forecast errors of the previous year made with regard to revenues and costs. To a large degree these errors can be explained by the unforeseeable low electricity price on the spot market in 2012: as a result the revenues of the transmission network operators from the sale of electricity quantities covered by the German EEG fell from January to September 2012 by approx. € 1.2 billion compared to the expected level. Approximately half of the effect of the negative balance can thus be traced back to the low wholesale electricity price in 2012, which was largely caused by the sharp fall in CO₂ prices. An additional reason which very probably explains the other half of the deficit is that the remuneration payments made to the plant operators were higher than originally envisaged. High costs resulted, particularly in September 2012, with the effect that the balance compared to August 2012 (minus € 1.67 billion) fell

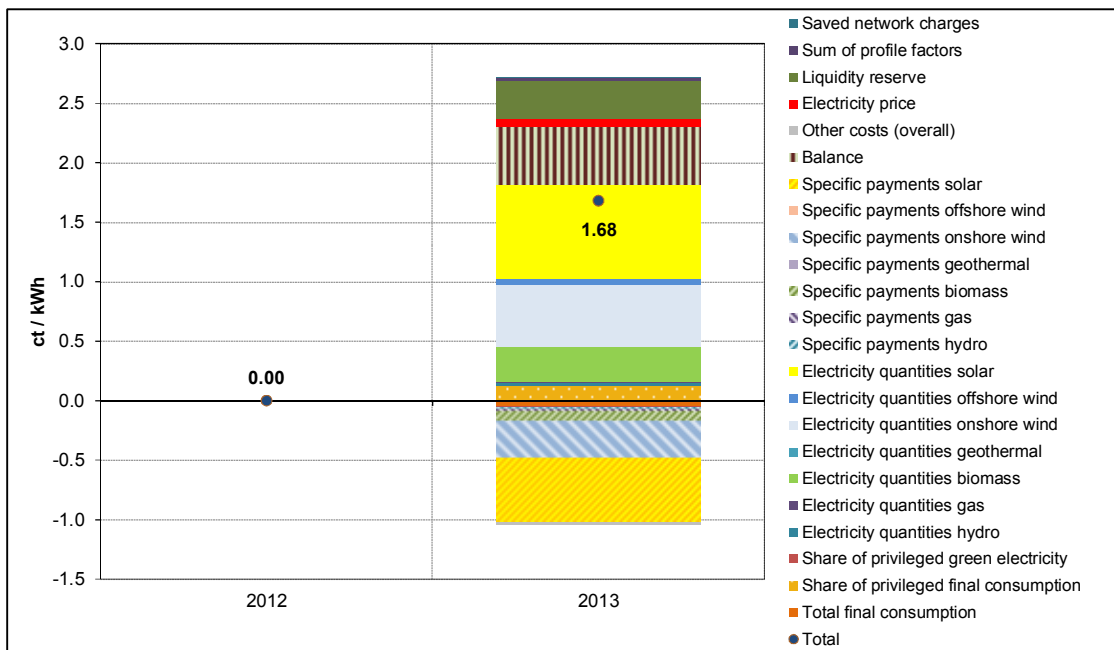
again significantly³. While the “electricity price-effect” can only partly be traced back to the expansion of renewable energies, the “remuneration payment effect” can be interpreted as retrospective payment for the expansion of renewable energies in 2012.

- As a reaction to the experiences made with forecast errors for revenues and costs in the past, the so-called **liquidity reserve** is increased in 2013 to 10% of the cumulated total (determined by the difference between payments made to plant operators and revenues on the electricity market); in 2012 it was only 3%. This measure leads to an increase in the German EEG surcharge of 0.31 ct/kWh (approx. 19% of the increase of the surcharge compared to 2012).
- The **expansion of the privileging** of electricity consumption – for which a reduced surcharge of only 0.05 ct/kWh applies – leads to an increase in the German EEG surcharge of 0.12 ct/kWh (7% of the increase).

³ (German transmission network operators 2012a).

A more detailed analysis of the increase of the surcharge for 2013 compared to 2012 shows that there are both components which increase the surcharge and components which decrease it. These are shown in Figure 2 and Table 1.

Figure 2 Detailed results of decomposition analysis: Contributions from the change of different factors influencing the increase of the German EEG surcharge for 2013 compared to 2012



Source: Calculations by Oeko-Institut

On this basis it is evident that:

- When considered in isolation, **solar power generation** – which significantly increases in the 2013 forecast compared to the 2012 calculation of the surcharge (from approx. 24 TWh to approx. 35 TWh) – leads to a significant increase in the EEG surcharge (plus 0.79 ct/kWh). At the same time, however, the lower remuneration rates decrease the surcharge by 0.54 ct/kWh. The fall in the remuneration rates thus compensates 68% of the effect of rising solar power generation.
- A relevant factor with regard to the effects of **onshore wind power generation** is the assumption of transmission network operators that 84% of the electricity produced is sold directly and profits from the market premium. This leads to a fall in revenues for transmission network operators since the respective electricity quantities are no longer through them. As a result – and due to the growth in wind power generation (56 TWh instead of the 50 TWh forecast for 2012) – the costs arising from the forecast quantities of electricity from wind power plants increase. When considered in isolation this leads to an increase in the EEG surcharge of 0.52 ct/kWh. At the same time, however, the

direct sales lead to a reduction in the payments made to the plant operators under the German EEG. Instead of full remuneration the transmission network operators only continue to pay the plant operators the market premium, which is significantly lower. This fall in specific payments made to the plant operators leads to a decrease in the EEG surcharge of 0.31 ct/kWh. This compensates 60% of the surcharge-increasing effect.

- In the case of **biomass power generation** a high share of direct sales is also assumed based on a market premium of 64%. The increase of the German EEG surcharge caused by the growth of the respective electricity quantities and the fall in revenue would, taken in isolation, amount to 0.3 ct/kWh. However, the decrease of the specific remuneration payments to the plant operators reduces the surcharge by 0.09 ct/kWh, which corresponds to a compensation effect of 30%.
- **Offshore wind energy** causes an increase of 0.05 ct/kWh, which is not compensated by the decrease in remuneration payments.

Additional factors, some of which have already been mentioned, change the German EEG surcharge compared to 2012 as follows:

- The negative **balance** of the previous year has to be equalised in 2013 by the payment of an additional 0.48 ct/kWh.
- The **liquidity reserve** assumed for 2013 based on 10% of the negative balance is larger than that for 2012 and constitutes an increase in the surcharge amounting to 0.31 ct/kWh.
- Compared to 2012 the rising **share of privileged final consumption** causes an increase of 0.12 ct/kWh.
- The **future electricity price** which is lower in comparison to 2012 leads to an increase of 0.07 ct/kWh.
- The assumption of an increase in **final consumption** in 2013 compared to 2012 decreases the German EEG surcharge by 0.04 ct/kWh.

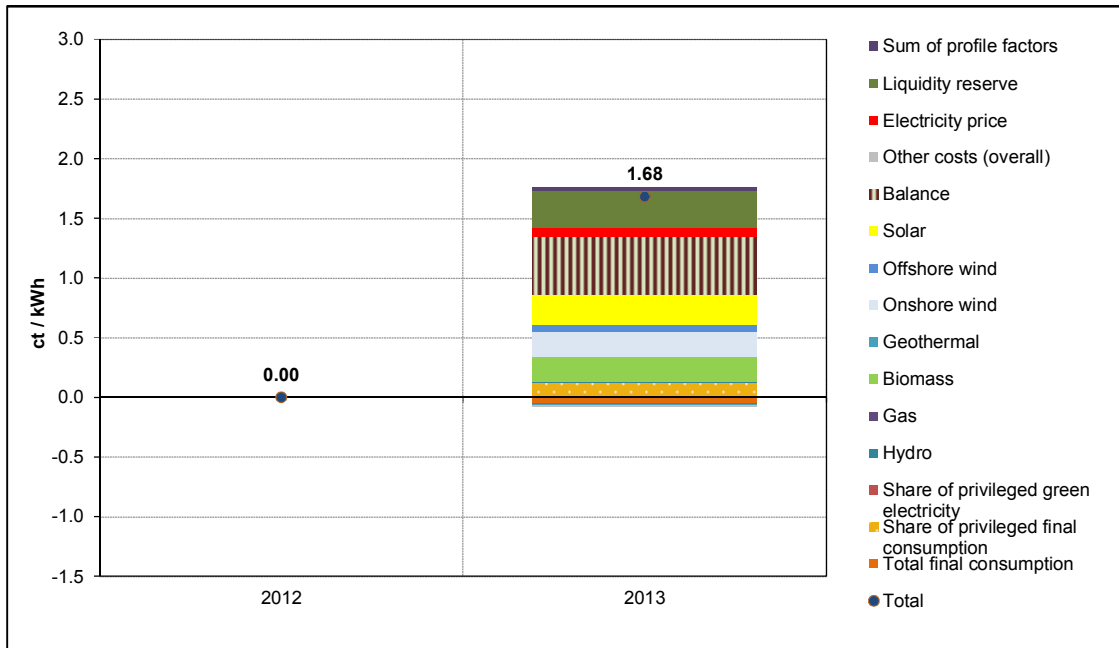
Table 1 Detailed results of decomposition analysis: Contributions from the change in different factors influencing the increase of the German EEG surcharge for 2013 compared to 2012

Influencing factors	2013 ct / kWh
Total final consumption	-0.04
Share of privileged final consumption	0.12
Share of privileged green electricity consumption	-0.02
Electricity quantities to be remunerated	
Electricity quantities hydro	0.03
Electricity quantities gas	0.01
Electricity quantities biomass	0.30
Electricity quantities geothermal	0.00
Electricity quantities onshore wind	0.52
Electricity quantities offshore wind	0.05
Electricity quantities solar	0.79
Specific payments to plant operators	
Specific payments hydro	-0.02
Specific payments gas	0.00
Specific payments biomass	-0.09
Specific payments geothermal	0.00
Specific payments onshore wind	-0.31
Specific payments offshore wind	0.00
Specific payments solar	-0.54
Saved network charges (all RE technologies)	0.01
Balance	0.48
Liquidity reserve	0.31
Other costs (overall)	-0.02
Profile factors (all RE technologies)	0.03
Electricity price	0.07
Total	1.68

Source: Calculations by Oeko-Institut

If the effects of power generation and of remuneration payments to the plant operators for renewable energies are set off against each other, the following, more consolidated picture emerges (Figure 3):

Figure 3 *Aggregated results of decomposition analysis: Contributions from the change of different factors (setting off power generation against payments to plant operators) influencing the increase of the German EEG surcharge in 2013 compared to 2012*



Source: Calculations by Oeko-Institut

The explicit data for the contributions of the different factors are shown in Table 2 in absolute and relative values. The only remaining negative contributions which decrease the German EEG surcharge are the slight increase in final consumption, the decline of consumption privileged as green electricity, and the decrease of other costs. The basic components which increase the surcharge have already been shown above.

Table 2 Aggregated results of decomposition analysis: Contributions from changes of different factors (setting off power generation against remuneration payments to plant operators) influencing the increase of the German EEG surcharge in 2013 compared to 2012

Influencing factors (aggregated)	2013	
	ct / kWh	%
Total final consumption	-0.04	-2.5%
Share of privileged final consumption	0.12	7.1%
Share of privileged green electricity consumption	-0.02	-1.2%
Increase (power generation and payments)	0.74	44.2%
<i>of which:</i>		
<i>Hydro</i>	<i>0.01</i>	<i>0.5%</i>
<i>Gas</i>	<i>0.00</i>	<i>0.2%</i>
<i>Biomass</i>	<i>0.21</i>	<i>12.4%</i>
<i>Geothermal</i>	<i>0.00</i>	<i>-0.1%</i>
<i>Onshore wind</i>	<i>0.21</i>	<i>12.6%</i>
<i>Offshore wind</i>	<i>0.05</i>	<i>3.1%</i>
<i>Solar</i>	<i>0.26</i>	<i>15.4%</i>
Balance	0.48	28.7%
Liquidity reserve	0.31	18.7%
Other costs (overall)	-0.02	-1.2%
Profile factors (all RE technologies)	0.03	1.7%
Electricity price	0.07	4.3%
Total	1.68	100%

Source: Calculations by Oeko-Institut

References:

- Öko-Institut, 2012. Komponentenerlegung der Umlage zur Förderung der Stromerzeugung aus erneuerbaren Energien über das Erneuerbare Energien Gesetz. Available (in German only) at: <http://www.oeko.de/oekodoc/1588/2012-444-de.pdf>.
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