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Creating the right incentives! – Modifying Germany's EEG exemption scheme for manufacturing industry

Author: Dr Caroline Dieckhöner, phone +49 (0) 69 7431-3854, research@KfW.de

The new German government is facing great challenges over a reform to the Renewable Energies Act (EEG). The EEG levy is to be raised again, and the increased number of exemptions for energy-intensive industries – and the greater burden this creates for other energy consumers – is now the subject of critical debate. The European Commission is also demanding changes. The Competition and Energy Directorates of the European Commission are currently reviewing the EEG and its exemptions, for reasons which relate to energy policy and the regulations governing state aid.

The list of exempted companies is extensive and has more than doubled since 2012. Whether and to what level these companies should continue to be exempted from the full EEG levy is to be examined again. In this context, a differentiated examination is needed with regard to the significance of energy costs and electricity prices for the economic viability of manufacturing industry and its competitive situation.

The Competition Directorate of the European Commission is currently examining the industry exemptions from the EEG levy. The heavily reduced EEG levy enjoyed by 1,716 companies (1,663 of which are manufacturing companies) possibly provides them with a competitive advantage over companies without exemptions. These exemptions are the subject of intense debate in Germany, as they mean that private households have to bear heavier EEG levies. The granting of exemptions from the full EEG levy should be reviewed once more.

This should be done against the background of the significance of electricity costs for the economic viability of various industries and the levy's influence on the international competitive position.

EEG levy higher than wholesale market prices

Comparing the EEG levy of around EUR 53/MWh (5.28 ct/kWh) with the 2012 average wholesale price of EUR 45/MWh, the fears of those companies which, depending on their degree of exemption, only have to pay EUR 0.5/MWh, are understandable.

Energy-intensive companies pay a reduced EEG levy. The exempted list includes companies in the manufacturing sector which consume over 1 GWh of electricity per year and whose ratio of electricity costs to gross added-value is at least 14 %.[1]

These prerequisites for exemption must have been achieved in the last financial year. If these requirements have been met, the EEG levy is limited in relation to the volume of electricity consumed. The levy is limited to 10 % for electricity consumption between 1 and 10 GWh, 1 % for consumption between 10 and 100 GWh, and to 0.05 ct/kWh if consumption exceeds 100 GWh.[2]

In contrast, households must pay the levy – and all future increases – in full. As a result, the debate over sharing this burden is growing in intensity.

Marked increase in number of exempted companies

The number of exempted companies has increased significantly in recent years. In 2005, 297 companies qualified for the exemption scheme. By 2012, their number had increased to 734, i. e. it had more than doubled. Due to the reductions made this year in the minimum electricity volume (from 10 GWh to 1 GWh) and in the ratio of electricity costs to gross added-value (from 15 to 14 %), the number of exempted companies has increased to 1,716 and has thus – once again – more than doubled compared with 2012.[3]

If an estimate for exemption claims for 2013 of 96 TWh is accepted (which is the grid operators' projection)[4], then the total volume of relief under the Special Compensation Scheme (BesAR) for 2013 would be EUR 4.5 to 5 billion.[5]

If all exemptions were completely withdrawn, then the remaining electricity consumers would pay a lower levy. On the basis of a simplified calculation, redistributing this amount of EUR 4.5 to 5 billion over those sales of electricity liable for an EEG levy (which amount to around 385 TWh)[6], together with the volume of 96 TWh previously exempted, would yield a reduction in the EEG levy of around 1 ct/kWh and result in an EEG levy of around 4.28 ct/kWh instead of 5.28 ct/kWh. For a private household with an annual electricity consumption of 3,500 kWh, this would mean a saving of EUR 35 p. a. This potential reduction from ending the industrial exemptions from the levy represents an upper limit, as exemptions must continue to apply for certain companies in order to avoid jeopardizing their competitiveness.

The amount does not at first sight appear to be especially high, considering that it

serves to protect a large number of jobs in Germany. However, the actual degree to which the competitiveness of exempted companies is endangered remains unclear. Given that the number of exempted companies has doubled in comparison to last year and that the EEG level is due to increase to 6.2 ct/kWh in 2014, the facts of the case regarding exemption should be examined more closely.

Indicators for the classification of energy costs

Measuring the variance between German prices for electricity and gas and average international prices for typical industrial customers yields direct information on energy-related cost differences. Producing such a comparison for the EU is feasible. However, it is difficult to establish for competitors in Asia and the USA. This is due to the poor data basis, especially in relation to volumes consumed and trends over time.

An alternative approach is to measure energy productivity. At a macroeconomic level, this corresponds to the ratio between gross domestic product and primary energy consumption. At company level, the ratio of gross value added (GVA) to energy or electricity consumption can be used as a measure of energy productivity (or electricity productivity). The inverse of this electricity productivity – the degree of electricity usage – can also be measured.

Table: Cost components in German industry

as a percentage of gross production value, 2011	Energy	Staff and temporary workers	Raw materials, excl. energy
Mining and manufacturing industries (total)	2.1 %	17.7 %	44.5 %
Manufacture of paper, paperboard and goods made thereof	6.4 %	15.9 %	48.1 %
Manufacture of chemical products	4.4 %	13.4 %	37.2 %
Manufacture of metals and fabricated metal products	5.1 %	12.4 %	61.3 %
Manufacture and primary processing of aluminium	5.6 %	12.1 %	59.4 %
Manufacture of textiles	3.7 %	20.7 %	45.9 %
Manufacture of articles of wood, straw and plaiting materials (excluding furniture)	3.7 %	16.4 %	49.2 %
Manufacture of beverages	3.0 %	16.8 %	34.9 %
Manufacture of food products	2.4 %	13.0 %	56.6 %
Manufacture of machinery	1.0 %	25.0 %	42.2 %
Coal mining	5.9 %	52.4 %	21.7 %

Source: Destatis (2012).

In the EEG, on the other hand, the ratio of electricity costs to GVA is defined as a threshold (electricity costs being 14 % of GVA). As an alternative, electricity costs are often calculated as a proportion of gross production value (GPV), due to the availability of appropriate data. In contrast to GVA, the GPV also incorporates the value of upstream services, including those relating to the electricity consumed.

Material and personnel costs significantly higher than energy costs

As a proportion of the GPV of manufacturing industry and mining in Germany, total energy costs in 2011 amounted to just 2.1 %. This seems rather modest in comparison to the material cost percentage (without energy) of 44.5 % and the personnel cost percentage of 17.7 %.

Energy-intensive industries are defined in this regard (EC Directive 2003/96/EC Art. 17) as those in which energy costs account for at least 3 % of the production[7] value. In particularly energy-intensive industries such as the paper industry or metal production and processing, the average percentage cost is around 5–6 %.

Potential impact of increases in electricity prices on profit margins

A simplified sample calculation show that an increase in electricity costs can have significant effects on a company's profit margins. The example demonstrates the importance of electricity costs, electricity productivity and the competitive situation for a company's profit margins. In simple terms, electricity productivity can be taken as the revenue U per unit of electricity used q, i. e. as U/q, and the profit margin as $(U-K)/U$. K in this context represents costs, which comprise energy costs K_E and other costs K_W such as personnel and material costs. For a company whose energy costs represent *7%* of sales $(K_E/U=7\,\%)$ and with a profit margin of *5%* $((U-K_W-K_E)/U=5\,\%)$, the profit achieved, disregarding energy costs, is *12%* of sales $(U-K_W)/U=12\,\%)$.

If energy costs now rise due to a doubling of the electricity price from *7%* of sales to *14%*, then the original profit margin falls from *5% (=12%-7%)*, *ceteris paribus* (c. p.), to a negative profit margin of *-2% (=12%-14%)*. If the energy costs double, then the electricity productivity (c. p.) must also double (or the quantity of energy consumed must be halved) in order to maintain the profit margin. This means that electricity productivity must rise in accordance with increasing electricity price in order to keep electricity costs and profit margins (c. p.) at the same level.

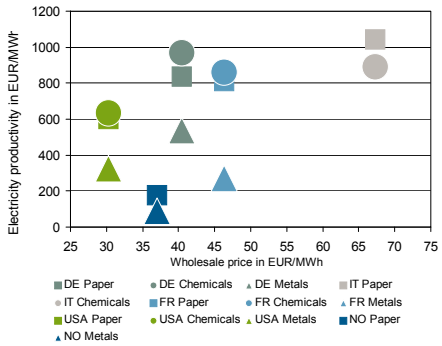
The effects on profit margins also depend on the extent to which higher electricity costs can be passed on to end customers via price increases. The price elasticity of demand within an industry determines what percentage of energy costs can be passed on to customers and does not ultimately have to be absorbed by the companies themselves. If, for example, three quarters of the additional electricity costs can be passed on to customers after a doubling of electricity prices, sales would increase by *5.25% (=75% x·7%)*. In spite of partially passing on the additional costs, energy costs would still account for *13.3% (=14%/105.25%)* of sales. Thus a profit margin of *3.1%* could still be achieved.

Hence price elasticity of demand and the competitive situation within the respective industry play decisive roles.

High level of electricity productivity in Germany

If an international comparison is made between the GVA achieved by individual electricity-intensive industries per unit of electricity consumed (electricity productivity in EUR/MWh; excluding EEG levy) in relation to electricity prices (see figure), the following picture emerges: Germany's wholesale prices are roughly average for the countries considered, while German electricity productivity, when examined industry-by-industry, is always among the leaders. The countries reviewed have structural differences in their electricity prices; for example, the abundance of water power in Norway makes low prices possible. It is also immediately apparent that higher prices offer an incentive to use electricity more efficiently.

Figure: Electricity prices and productivity in electricity-intensive industries



Averages for the years 2002 and 2010, subject to data availability.

Source: OECD (2013), European electricity markets.

Especially in the USA, the electricity-intensive industries that were analysed exhibit only a low level of electricity productivity. From the figure, it seems that moderate increases in electricity costs due to higher taxes or levies can certainly be offset by higher electricity productivity, in order to maintain the economic efficiency and competitive position of an industry.

A macroeconomic evaluation of the effects of electricity cost increases would also have to include the impact on value-added chains; the companies concerned may be key suppliers to other industries (e. g. the aluminium processing industry and the automotive industry), and thereby influence in turn the production costs of the latter.

Limitations of available indicators

There are difficulties in using electricity productivity (or its inverse, the degree of electricity usage) – or even the percentage of GVA accounted for by electricity / energy costs – as indicators for measuring the competitiveness of an industry; the magnitude of these indicators is influenced by a variety of factors, which complicate interpretation. These include, for example, the composition of the industry, the production technologies selected, the prices for other production factors, and oil price fluctuations. This means that, in any event, a simple relationship between the value of the indicator and international competitiveness is not guaranteed.

A major problem with the definition of electricity-intensive companies as set out in the EEG is that energy efficiency increases reduce the percentage and, for companies that are on the 14 % limit, they represent a disincentive for saving electricity. Investments in energy efficiency could then result in higher levies for companies. Energy-efficiency improvements made by companies should, however, be rewarded and not penalized by assigning the company to a higher EEG-levy category. The simple percentage of GVA accounted for by electricity costs should not, therefore, be the only deciding factor in determining to what extent the EEG-levy impairs the competitive situation of an industry or of individual companies.

Other locational factors also crucial

In general, an overall classification of companies' competitiveness would be useful. Thus although individual competitive factors such as wages or energy costs may be disadvantageous, they can be compensated by other factors such as locational advantages.

Such a comprehensive classification of the effects of a company's electricity costs would, on the one hand, have to take into account the markets in which the company operates and the situation with respect to international competitors. On the other hand, it would also need to consider the general strengths and weaknesses of Germany as a manufacturing base.

For example, specifically in relation to electricity supplies, quality in the sense of reliability of supply plays a major role. Some industries are heavily dependent on a high standard of supply continuity. For example, even very brief power interruptions can jeopardize key processes or damage machines, entailing very high costs.

Excursus: supply reliability in Germany

Up to now, the cost reductions generated by a high standard of power supply reliability have largely been ignored in evaluating the competitiveness of German industry. The SAIDI value (System Average Interruption Duration Index) measures the average duration over a year for which a customer is affected by power cuts. The SAIDI value for all end consumers in Germany in recent years has been between 14 and 22 minutes (15.91 mins in 2012)[8] compared with around 244 minutes in the USA[9].

Raising energy efficiency even further

Against the current background – the German government's energy-saving targets, a further improvement in the competitiveness of energy-intensive industries, and the estimated potential for improving economic energy efficiency in the commercial sector by around 10 % by the year 2020 (compared to final energy consumption in 2010) – efforts in this area should be increased further still. Energy-efficiency potentials derive in particular from the application of interdisciplinary electricity technologies. These include the use of high-efficiency motors (especially in compressed air systems, pumped systems and ventilation systems) and the deployment of high-efficiency lighting technology and industry-specific technologies in energy-intensive processes.[10]

The greatest constraints to the implementation of energy efficiency measures in small and medium-sized enterprises (SMEs) are posed by statutory framework conditions, lack of information and, to some extent, insufficient funds. As SMEs account for 90.5 % of companies and 48.5 % of the workforce in energy-intensive industries, there is a continued need here for finance and state funding. Support should also be provided for consultancy services.[11]

Conclusion

An increasing number of companies have qualified in recent years for the exemptions from EEG-levies available to energy-intensive industries. Against the background of rising EEG-costs and their distribution across fewer final consumers, these exemptions are currently once again being called into question.

The pending revised version of the exemptions from the EEG-levy should be differentiated more precisely:

Instead of applying an across-the-board

14 % electricity cost threshold for all manufacturing industries, distinctions should be made in an industry-by-industry comparison with key competitor countries according to:

- their respective degree of electricity use and their electricity productivity,
- the international competitive position,
- and the energy efficiency potential still available to the various respective industries.

Strengthened energy and climate policy measures and the higher energy prices which accompany them create significant long-term energy efficiency incentives. Furthermore, investments in energy efficiency at company level should receive additional support, and short to medium term incentives should be created. Increased support for energy efficiency in energy-intensive companies will not only reduce CO_2 emissions, but also improve the competitive position of companies by lowering energy costs. ■

[1] Sections 40 to 42 of the EEG define the special compensation arrangements (BesAR) for limiting electricity costs and maintaining the competitiveness of manufacturing companies and rail transport operators.

[2] See EEG sections 40 and 41. There are other exemption arrangements for energy-intensive companies in the rail transport sector with power consumptions above 10 GWh.

[3] See BMU (2013): Hintergrundinformationen zur Besonderen Ausgleichsregelung, http://www.bafa.de/bafa/de/energie/besondere_ausgleichsregelung_eeg/publikationen/bmu/eeg_hintergrundpapier_2013.pdf; see Frauenhofer ISI (2011): Vorbereitung und Begleitung der Erstellung des Erfahrungsberichtes 2011 gemäß § 65 EEG im Auftrag des Bundesministeriums für Umwelt, Naturschutz und Reaktorsicherheit.

[4] See BMU (2013): Hintergrundinformationen zur Besonderen Ausgleichsregelung, http://www.bafa.de/bafa/de/energie/besondere_ausgleichsregelung_eeg/publikationen/bmu/eeg_hintergrundpapier_2013.pdf.

[5] This depends on whether one uses the figure of 0.53 ct/kWh (10 % of 5.28 ct/kWh) or 0.05 ct/kWh of the full EEG levy of 5.28 ct/kWh.

[6] See grid operators (50Hertz, Amprion, EnBW, Tennet (ÜNB)): Prognose der EEG-Umlage 2013 nach AusglMechV – Prognosekonzept und Berechnung der ÜNB (version of 15 October 2012), http://www.eeg-kwk.net/de/file/Konzept_zur_Berechnung_und_Prognose_der_EEG-Umlage-2013.pdf.

[7] The production value used in the EC directive roughly corresponds to the gross production value applied in the collection of German statistics.

[8] See BNetzA (2013): Übersicht über die SAIDI-Werte Strom seit dem Jahr 2006, http://www.bundesnetzagentur.de/cln_1931/DE/Sachgebiete/ElektrizitaetundGas/Unternehmen_Institutionen/Versorgungssicherheit/Stromnetze/Versorgungsqualit%C3%A4t/Versorgungsqualit%C3%A4t-node.html.

[9] This value is for 2008 and does not cover all U.S. states. See Eto, J. H. and K. Hamachi LaCommare (2008): Tracking the Reliability of the U.S. Electric Power System: An Assessment of Publicly Available Information Reported to State Public Utility Commissions http://certs.lbl.gov/pdf/lbnl1092e-puc-reliability-data.pdf.

[10] See IFEU, Frauenhofer ISI, Prognos, GWS (2011): Energieeffizienz: Potenziale, volkswirtschaftliche Effekte und innovative Handlungs- und Förderfelder für die Nationale Klimaschutzinitiative.

[11] See Institut für Mittelstandsforschung (2012): Die Bedeutung von kleinen und mittleren Unternehmen in den energieintensiven Industrien, Prognos (2010): Rolle und Bedeutung von Energieeffizienz und Energiedienstleistungen in KMU.