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Memo

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Berlin, 23 June 2013

The current electricity costs of energy-intensive industries in Germany

Background

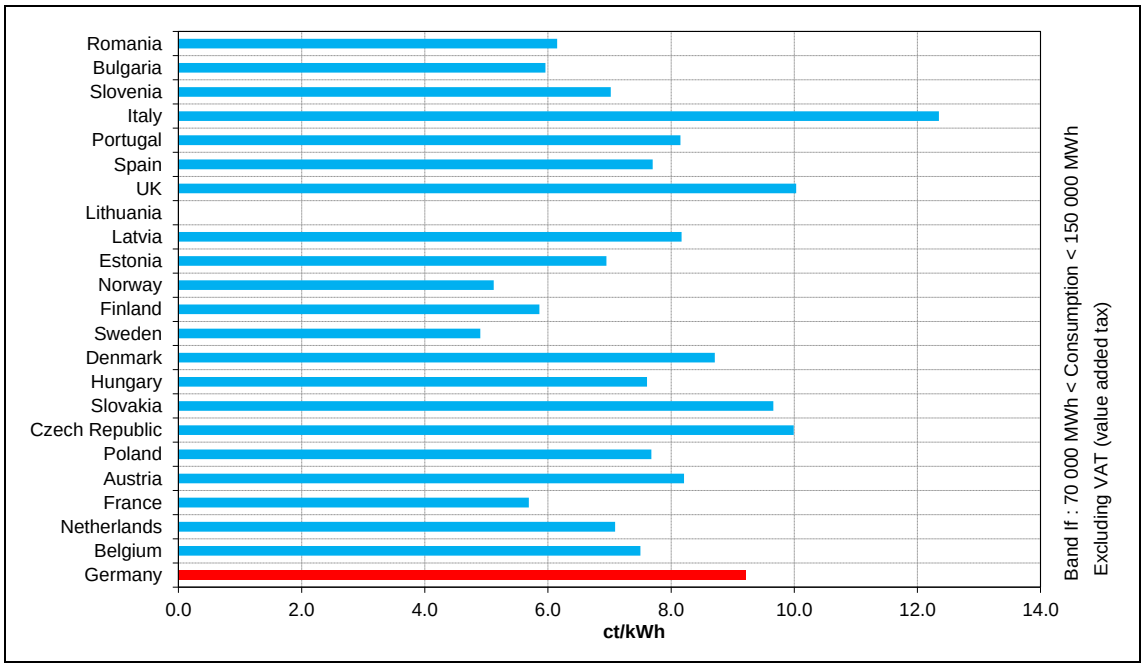
The electricity costs incurred by energy-intensive industries feature significantly in current discussions surrounding the transformation of the energy sector in Germany. A key problem relating to these discussions is that, although there have been a whole host of comparative statistics and analyses of industrial electricity prices in general, the parameters specific to the electricity cost burdens of the energy-intensive industries have not been sufficiently addressed, if at all. The energy-intensive industry sectors are on the one hand faced with the electricity prices generated on the relevant markets, but on the other hand also benefit from not inconsiderable flanking measures.

Against this background, the aim of this short analysis is to show the prices and costs relevant to the energy-intensive industries, including the relevant privileges.

General electricity prices for industry

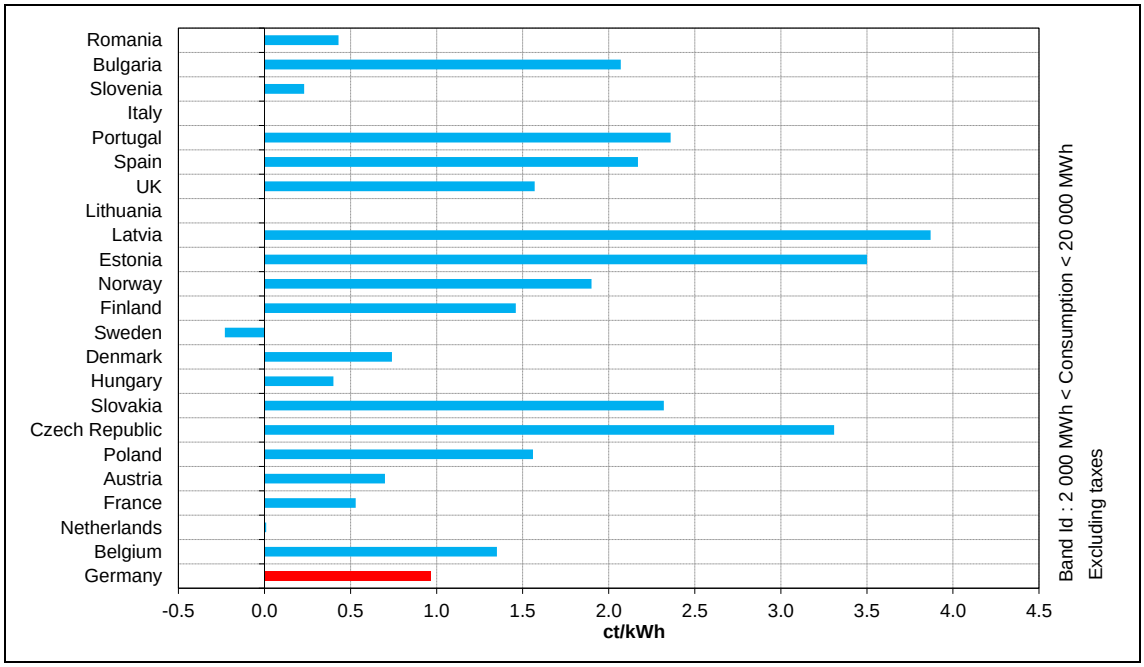
The official statistics record not only the electricity prices charged to private households, but also compare the prices for industrial consumers at the European level. Figure 1 shows the most recent data available (2012) and gives a comparison of major industrial consumers in various EU countries. In the consumption band of 70 to 150 gigawatt hours (GWh – a million kilowatt hours), the representative price for Germany in 2012 amounted to approx. 9.2 Euro cents per kilowatt hour (ct/kWh). The prices for this consumption band in the country comparison are therefore by no means the highest, but are certainly in the upper echelons. Setting aside just a handful of countries (Scandinavia, France, Romania and Bulgaria), the German price does, however, fall comfortably within the range of the electricity prices determined for the other EU countries.

Figure 1 A comparison of the electricity prices (excluding VAT) for major industrial consumers in various EU countries, 2012



Source: Eurostat, Öko-Institut calculations

Figure 2 A comparison of the change in electricity prices (excluding VAT) for major industrial consumers in various EU countries, 2007–2012



Source: Eurostat, Öko-Institut calculations

Yet a comparison of several years (Figure 2) clearly illustrates that the changes in prices have varied greatly over time from country to country and that the change in prices in Germany is relatively low. The comparatively high industrial electricity prices for the cases of German consumption recorded here are therefore the result of a baseline effect, rather than a serious increase in prices in recent years.

However, the fundamental problem of these price comparisons based on official statistics is that a number of basic conditions for the energy-intensive industries are not taken into account in the officially recorded industrial electricity prices. These include on the one hand network access fees and on the other hand electricity taxation and the compensation payments to the energy-intensive industries made possible in this and other contexts. With this in mind, the following sections will focus on the composition of electricity prices and of the corresponding compensation measures for the energy-intensive industries in particular.

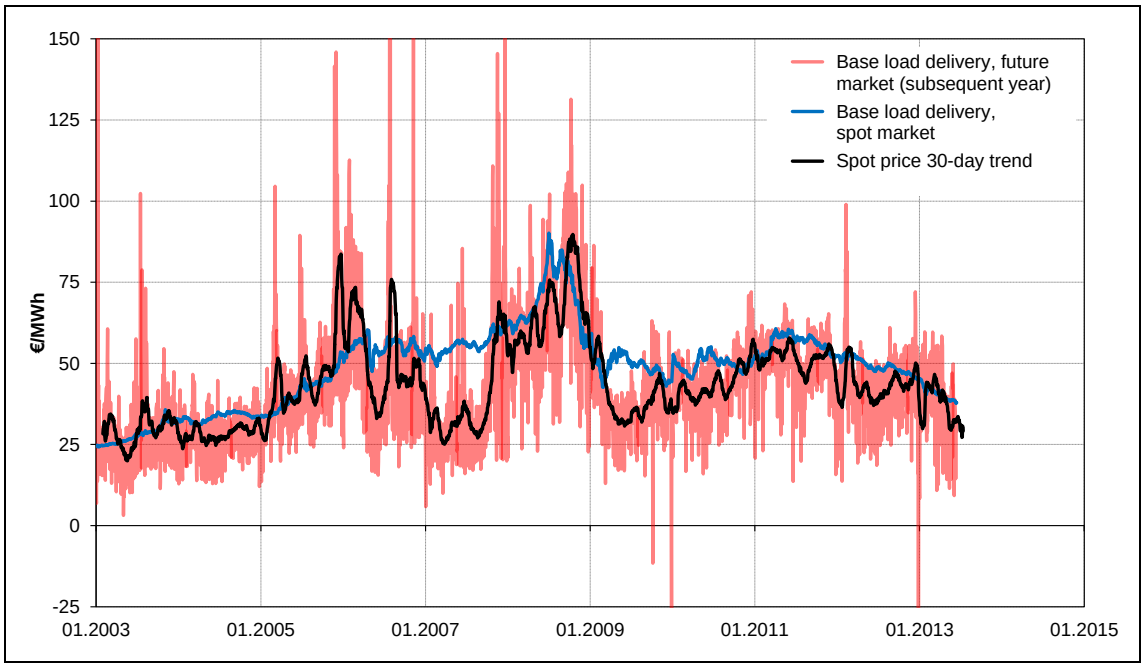
Price developments in the wholesale electricity markets

Bulk consumers – a category which includes the vast majority of energy-intensive industries (chemicals, iron and steel, non-ferrous metals, etc.) – base their electricity procurement on the reference prices of the European Energy Exchange (EEX). They can arrange their electricity procurement both as future deliveries and on the basis of daily or intraday spot trading. The prices that the companies pay for future deliveries are slightly higher than those on the spot market, but using future deliveries largely eliminates the volatility risks inherent to spot markets. In reality, bulk consumers structure/optimise their electricity procurement on the basis of their risk appetite, using a portfolio of various future and spot market products.

Figure 3 shows the development of prices for future base load deliveries (for the subsequent calendar year in each case) and in spot trading (for the following day in each case). This overview illustrates on the one hand that the two price trends basically follow the same course, but that on the other hand the spot market prices of electricity are much more volatile. Equally, though, it is evident that the mean values for spot market procurement generally go hand in hand with the potential to secure low electricity procurement prices on the exchange. In other words, hedging against the volatility of the spot market by making use of forward procurement consequently results in the procurer paying a price surcharge.

Midway through 2012, the spot market price for base load deliveries was €42.67 per megawatt hour (€/MWh) on the EEX. This fell to €39.40/MWh for the first five months of 2013, while the average price from the beginning of June to the mid-month mark was a mere €26.92/MWh. The corresponding future base load prices for the following year were €49.22/MWh in 2012, falling to €41.03/MWh for the first five months of 2013, and down to just €38.19/MWh on average for the first half of June.

Figure 3 Development of future and spot market prices for base load deliveries, 2003–2015



Source: EEX, Öko-Institut calculations

The general trend of falling prices can be attributed to three factors in particular:

- a slight drop in hard coal prices;
- the still (too) low price level for emission allowances within the EU Emissions Trading Scheme (carbon prices); and
- the price-lowering effects of expanding renewable energies (which are above all – but certainly not exclusively – reflected in the spot market).

In addition, the especially low prices in May and June are caused by the seasonally low demand (end of the heating season, an accumulation of public holidays, etc.).

Prices of €40/MWh or less can therefore currently be secured on an electricity exchange, depending on the procurement strategy adopted.

Based initially on an exchange's reference price, the electricity procurement costs can be further reduced by an array of special provisions for the energy-intensive industries.

Compensation for pass-through of carbon costs to the wholesale market prices

In the first instance, the EU Emissions Trading Scheme and the European Union's corresponding state aid guidelines [1] allow the member states to compensate the energy-intensive industries for the carbon costs priced in on the electricity market. The corresponding ruling for Germany has been in force since January 2013 and allows for the compensation of a sizeable proportion of the carbon cost mark-up on the wholesale market.[2] It stipulates that in 2013 a company can be reimbursed for 85% of the reference cost mark-up for 760 grams of CO_2 per kWh, based on sector-specific electricity consumption values. With a real carbon cost mark-up on approximately 900 grams of CO_2 per kWh in the Continental European market, there is compensation of approximately 70% of the carbon costs effectively priced in. With a medium carbon price of €4.56 for the first five months of 2013 (the compensation of carbon costs priced in to the electricity market was not permissible before 2013) there is compensation of around €3.20/MWh, which can be subtracted from the afore-mentioned electricity price of approximately €40/MWh (or the corresponding low values), resulting in an effective cost of procuring electricity via the wholesale market of less than €37/MWh.

Broad exemption from grid utilisation charges

Energy-intensive companies can have themselves largely exempted from paying network access fees if they meet certain criteria. The legal foundations for this are given by Section 19 (2) sentences 1 and 2 of the German Electricity Network Charges Ordinance (StromNEV).[3] Pursuant to Section 19 (2) sentence 1 StromNEV, companies can negotiate individual network access fees and, according to Section 19 (2) sentence 2, companies can have themselves entirely exempted from network access fees.

Full exemption is above all possible if the electricity procurement for a company's own consumption equals at least 7,000 hours of use from a single consumption point within the general supply grid and if the electricity consumption from the said consumption point exceeds 10 gigawatt hours (GWh). This would apply for most energy-intensive bulk consumers. The network operators' resultant shortfalls in income are offset by allocation of the costs to the final consumers. In turn, this cost allocation amounts to a

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1 Communication from the Commission, *Guidelines on certain State aid measures in the context of the greenhouse gas emission allowance trading scheme post-2012* (OJ EU C 158 dated 5 June 2012, p. 4).

2 German Federal Ministry of Economics and Technology (BMWi), *Directive on state aid for companies in sectors/subsectors in relation to which the assumption is made that there is a considerable risk of 'carbon leakage' due to the costs relating to EU ETS certificates being priced in to electricity prices (state aid for indirect carbon costs)*, 30 January 2013 (German Federal Gazette, BAnz AT 07.02.2013 B1).

3 *Electricity Network Charges Ordinance (StromNEV)* dated 25 July 2005 (Federal Law Gazette BGBl. I, p. 2,225), as amended by Article 4 of the Act dated 28 July 2011 (BGBl. I, p. 1,690).

mere €0.25/MWh for the energy-intensive bulk consumers and is therefore all but negligible, especially in view of the economic benefits of their being exempted from paying network access fees.

Individual network access fees may be arranged, i.e. partial exemption is possible, if a company's peak load can be foreseen to deviate from the peak load situation of the network in question. These companies may be awarded discounts of up to a maximum of 80% of the network access fees. In the case of steelworks, for example, the discounts are at least 30 to 40%.

Free allocation of emission allowances

Almost right across the board, the energy-intensive companies receive sizeable free allocations of emission allowances within the EU Emissions Trading Scheme (EU ETS). These allocations are still very generous after the start of the third EU ETS trading period, because while the allocation process was switched to relatively ambitious benchmarks (representing the top 10% of plants in the EU), these benchmarks relate to the production levels of the (pre-crisis) reference period of 2005 to 2008, such that the effective free allocation is again very generous. It should also be noted that the iron and steel industries effectively continue to benefit from free allocation for the generation of electricity using by-product gases, even though electricity generation is, as a rule, excluded from this free allocation as of 2013.

It will not be possible to fully evaluate the actual allocation situation of energy-intensive industries until the definitive allocation data becomes available, but the data available to date indicates a very high free allocation once again and therefore of the broad exemption from the carbon costs incurred due to the EU ETS.

Cost benefits and cost allocation of the flanking measures for electricity generation from renewable energies

Providing support for electricity generation from renewable energies through flanking measures results in some significant price effects in the wholesale electricity market. An econometric analysis of this 'merit order effect' reveals an approx. €10/MWh reduction in the wholesale price in 2012. In other words, without flanking measures for electricity generation from renewable energies, wholesale electricity prices would have amounted to more than €50/MWh in 2012.[4] As the active final consumers within the wholesale market, energy-intensive industrial companies benefit from these price-reducing effects, but are only required to pay marginal sums to make up the shortfalls in the support system. This means that companies having procured at least 100 GWh

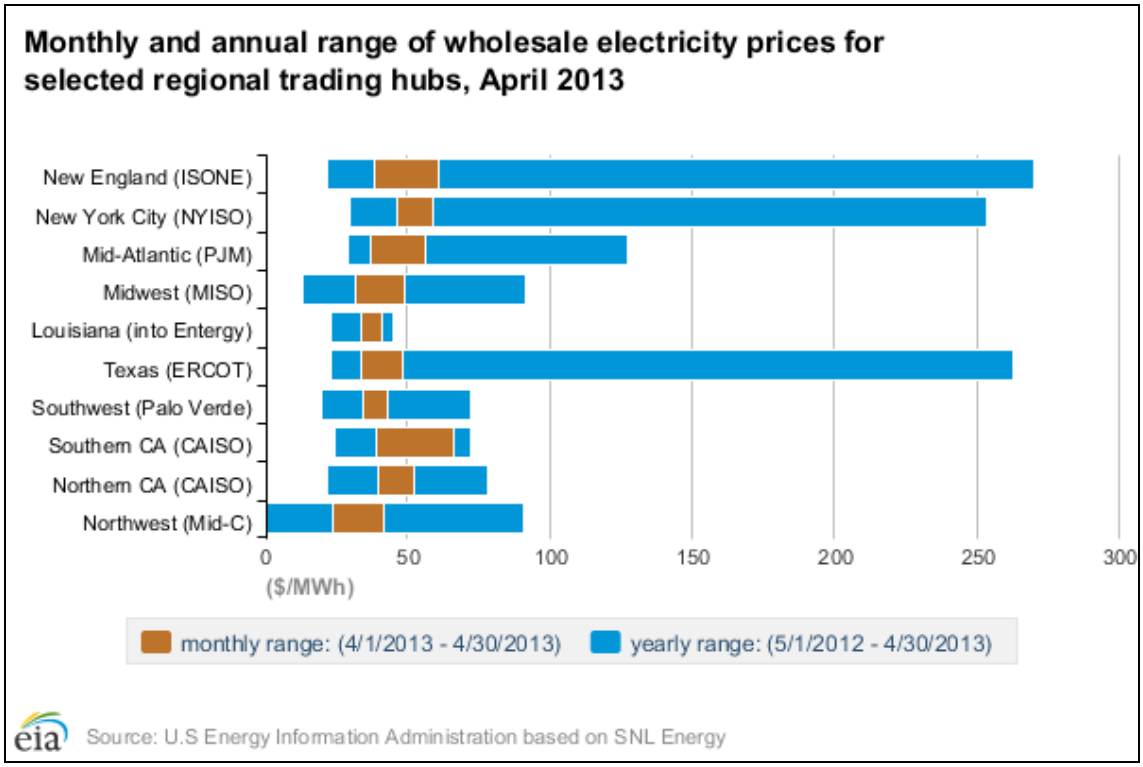
[4] Cludius, J., Hermann, H., Matthes, F. Chr.: *The Merit Order Effect of Wind and Photovoltaic Electricity Generation in Germany 2008–2012.* CEEM Working Paper 3-2013, Sydney, May 2013.

from the general supply grid and with a ratio of electricity costs to their gross value added of more than 20% are only subject to a surcharge €0.50/MWh in accordance with the German Renewable Energy Sources Act (Section 41 [3] [2] EEG).[5] The net benefit of supporting electricity generation from renewable energies is therefore only little less than €10/MWh.

Final remarks

Electricity prices in the USA are frequently cited as benchmarks in current discussions. It is not possible to give a detailed account or analysis of the US electricity price situation here. Brief reference can, however, be made to the following situation.

Figure 4 *Range of wholesale electricity prices for selected regional trading hubs in the USA*



Source: *Source: Energy Information Administration*

With natural gas prices once again rapidly rising in the US since mid-2012, the US Energy Information Administration's price summary for April 2013 (Figure 4) gives a realistic account of the electricity price situation on the wholesale markets in the USA.

[5] *German Renewable Energy Sources Act (EEG)* dated 25 October 2008 (Federal Law Gazette BGBl. I, p. 2,074), as amended by Article 5 of the Act dated 20 December 2012 (BGBl. I, p. 2,730).

Price levels in the range of US $40–50/MWh were recently being recorded at most trading hubs, equating to prices of around €30–40/MWh. These price levels are, at least at the moment, not far off the Continental European levels, especially when the privileges mentioned above (CO_2 compensation, exemption from network access fees) are also taken into account. The mechanism of these compensatory measures (in particular in relation to the compensation of CO_2 costs) would uphold the substantial comparability of these prices, even in the case of significant price increases caused by a reform of the EU ETS.