Deutsche Bank
Research

Standpunkt
Deutschland

Energiewende 2.0 – don't risk competitiveness

26 November 2013

David Folkerts-Landau
Group Chief Economist

Editors
Gilles Moec
Head of European Economic Research

Barbara Böttcher
Head of European Policy Research

Stefan Schneider
Chief German Economist

Deutsche Bank AG
DB Research
Frankfurt am Main
Germany
E-mail: marketing.dbr@db.com
Fax: +49 69 910-31877

www.dbresearch.com

Germany´s hard-won competitiveness is under threat. In the early 2000s, when it was considered the "sick man of Europe", Germany made a concerted and ultimately successful effort to reduce the cost labour. Today the cost of another input – energy – needs to be contained to ensure that further rising energy prices do not threaten Germany's status as an export powerhouse and undermine its competitiveness against the US and the rest of the world. Compared with 2007, electricity prices for industry and households are up some 20%-40% in Germany, pushing them to the top ranks in Europe. This is the result of deliberate government policy to transition Germany to a low-carbon energy environment using subsidies to renewable energy, at a cost of EUR 23.6 bn next year.

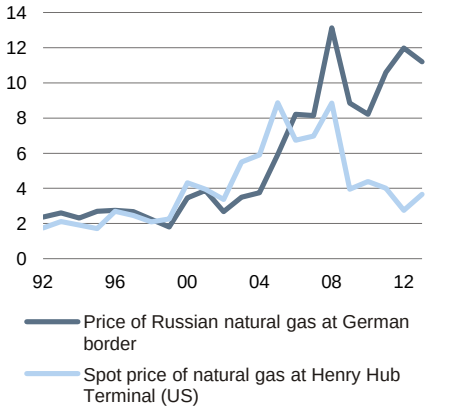
True, Germany's power mix already sources 23% of its energy from renewable sources and further expanding it could become a source of long-term competitiveness. However, in the meantime the industry has to pay two and a half times more for electricity than in the US. Naturally, energy-intensive industries are increasingly giving Germany the thumbs down as a production location. Indeed, the IEA estimates that Europe will lose 10%-points in global market share for exports in energy-intensive goods by 2035. Moreover, high electricity prices are often particularly damaging to the Mittelstand (SMEs) since, unlike global companies, it has less flexibility to absorb the cost shock. Our view is that the expansion of renewables, while a worthy long-term goal, is presently jeopardising German competitiveness. If the current subsidy regime is not changed, over EUR 100 bn in additional investment will be required to reach the 2020 targets. As a result, the renewable levy for all non-exempt users would rise by roughly 50% by 2020. If electricity prices continue to climb, it may lead to a self-reinforcing spiral of a shrinking user base and higher energy costs for industry.

To prevent this, the Energiewende – i.e. energy turnaround or transformation – must be implemented more efficiently. We welcome government plans to impose a minimum levy on new systems for captive generation. To ensure the levy doesn't also rise unsustainably, the subsidies should gradually be phased into market-based price and volume mechanisms. The government should tighten exceptions to the levy, while continuing to shield the energy-intensive companies most vulnerable to international competition.

For Germany to remain an export powerhouse, we need an "Energiewende 2.0," one that will improve the efficiency of the current system as well as introduce market mechanisms for future energy pricing. Only in that way will energy-intensive and globally exposed German-based companies be able to compete on a level-playing field with their international peers.

Natural gas: Much cheaper in the US than Germany 1

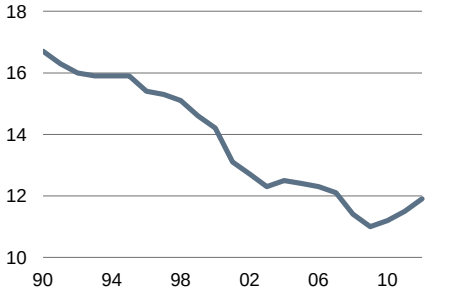
USD per million metric BTU



Source: IMF

Industry has started to regain importance in the US 2

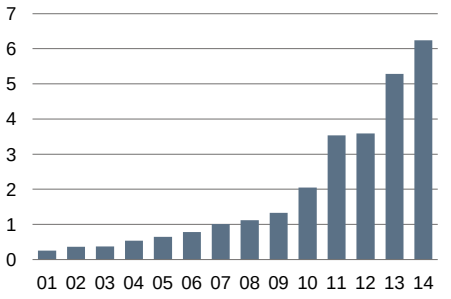
Manufacturing's share in GDP (%)



Source: Bureau of Economic Analysis

EEG levy escalating 3

Ct/kWh



Source: German Federal Ministry for the Environment

Energiewende 1.0 erodes competitiveness

Since the end of the 1990s, German energy policy has mainly focused on the development and expansion of renewables and – quite generally – on the environmental target in its triangle of objectives (energy security, affordable prices and ecological sustainability). As a result, there is currently a conflict between funding the rising costs of the Energiewende and preserving industry's competitiveness. As oil, the world's leading energy source, was extremely cheap until the late 2000s and held down the price of natural gas it was understandable that slightly less weight were attached to the objectives of efficiency and security of supply. The EU-wide liberalisation of the electricity market initially also influenced this order of priority, since in the early years it stimulated competition and had a dampening effect on prices.

Over the past few years, however, the global energy sector has been in the throes of a colossal upheaval. The trend towards unconventional natural gas and oil that started in the US is exerting downward pressure on virtually all energy prices there. This brings relief to the private consumers in North America and gives local industry a boost. The "re-industrialisation" of the US has long ceased to be just a matter of speculation. It is actually taking place with manufacturing's share in GDP having increased over the past few years. German companies are ramping up their US investments, partly because of the low energy prices there – lately, major chemicals groups have jumped on the bandwagon too. In its current World Energy Outlook the International Energy Agency (IEA) expects the US cost advantage vis-à-vis Europe to persist until 2035.

The EEG in a nutshell

The Renewable Energy Sources Act (EEG) is the most important instrument for promoting renewable energies in the German electricity market.

The EEG guarantees priority to the feed-in of renewable electricity into the power grid (priority feed-in).

Furthermore, power generators receive guaranteed remuneration for renewables-based feed-ins for 20 years (EEG levy); this makes investments in renewables commercially viable.

The EEG levy is added to the electricity price, so the risks of investing in renewables are transferred de facto to the customers.

The size of the EEG levy varies depending on the type of renewable energy generated and other criteria (e.g. location and capacity of the generating facility).

The basic principle is that the higher the cost of producing electricity from the given renewable, the higher the EEG levy.

There are many exemptions from the EEG levy; very energy-intensive companies pay sharply reduced rates; captive generation is so far also exempted from the EEG levy.

Households and the majority of industrial users are subject to the full EEG levy.

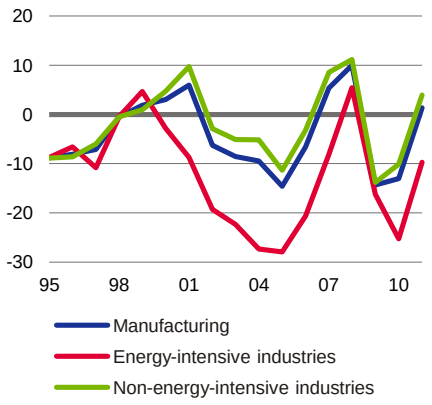
Priority feed-in for renewables results in input from conventional generating plant having to be run down during windy and/or sunny periods, which lowers their annual average load factor and profitability.

Moreover, the EEG has led to divergence between electricity prices: the extremely low marginal costs of renewables and their priority feed-in weigh on electricity prices on energy exchanges such as the EEX, because price formation there is based on the marginal cost principle (merit-order effect). By contrast, power bills for most end-users are on the rise because the EEG levy is added to the electricity price in order to fund the cost of investment in renewables.

In the first few years following the implementation of the Renewable Energy Sources Act (EEG) in 2000, the cost burden on German businesses was still considered tolerable. However, since the end of the past decade, the EEG has been partly responsible for a jump in German electricity prices even though some energy-intensive companies have benefited from price-dampening special arrangements. At the same time in most of the EU member states electricity prices are much lower than in Germany, even without the benefit of unconvent-

Energy-intensive industries not keen on new investment 4

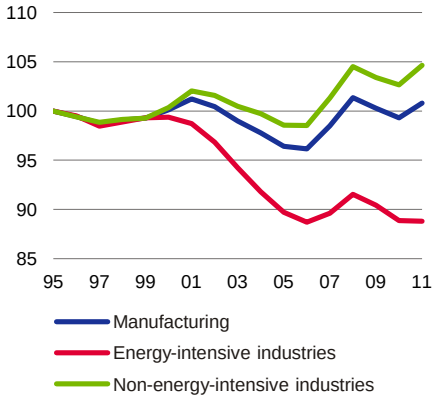
Net fixed capital formation as % of gross fixed capital formation



Source: Federal Statistical Office

Net fixed capital formation falling in energy-intensive industries 5

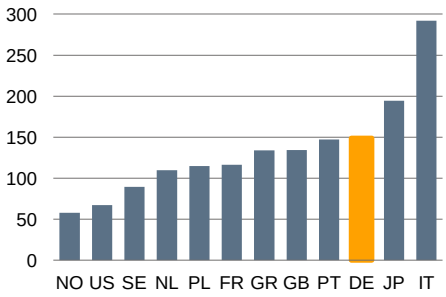
Net fixed assets, 1995=100



Source: Federal Statistical Office

German industry has relatively high electricity costs 6

USD per MWh, 2012



Source: IEA

ional natural gas resources. Barring a fundamental reform, the last Merkel government's U-turn on energy policy – referred to as the "Energiewende" – will drive German electricity prices even further up over the coming years and thus hurt Germany's international competitiveness – from the small and medium-sized enterprises of the Mittelstand right through to the big industrial players. The EEG levy was just lifted to 6.24 cents/kWh for 2014, up from 5.28 cents/kWh in 2013 (2012: 3.27 cents/kWh), meaning that the promotion and subsidisation of renewables in Germany now adds up to EUR 20 bn per year. A reform of the EEG in particular is thus overdue.

The success of the Energiewende is predicated on other factors, too, such as the use of conventional generating stations in the transition period, the rapid extension of the high-voltage grid for the transmission of wind power from northern to southern Germany and the development of storage capacities.

The new grand coalition government would be well advised to swiftly tackle the challenges surrounding the Energiewende and rising energy costs in Germany and implement the necessary reforms. The often overlooked urgency of the matter is starkly documented by the business community's investment plans. They reflect the heightened and spreading uncertainty over future energy policy. It is vital to stop the disproportionately strongly rising energy costs affecting Germany as a production location. Otherwise, there is a risk that energy-intensive industries and individual large-scale (carbon) emitters in particular may opt for locations outside Germany or even Europe if they are reviewing their pending investment plans. This would have negative economic effects on Germany (e.g. job losses) and often negative ecological consequences (such as higher traffic volumes or lower environmental standards outside Europe). The statistics of the past few years document that this is by no means merely a pessimistic foresight scenario pertaining to future energy cost increases, but rather a trend which has been forming for years and continually gaining relevance (see Figure 4 and 5). Despite the availability of partially reduced electricity prices in Germany it is precisely the energy-intensive industries that have been investing noticeably less in the maintenance of their production facilities. Since the mid-1990s there have been only two years in which energy-intensive industries have reported positive net fixed capital formation, i.e. increased capacity. According to IEA estimates, the EU will lose 10 pp in global market share for exports in energy-intensive goods until 2035.

The bottom line is that the (prospective) higher energy costs in Germany are certainly one major reason for the reluctance to invest. After all, when an (energy-intensive) company intends to invest in new plants and wants to reap the benefits for 20 to 30 years, not only its expectations regarding energy prices but also the security of supply and the reliability of the energy policy framework are decisive factors. Germany currently scores poorly on both counts. Moreover, heavy burdens on energy-intensive businesses would also have negative cost repercussions for downstream industries which themselves are not energy-intensive producers (e.g. auto industry, mechanical and electrical engineering). In some cases, they even include manufacturers of the products needed for the Energiewende to succeed. If energy-intensive industries were saddled with an excessive cost burden, one of Germany's advantages, i.e. the vertical integration of the industrial value chain (a key factor in overcoming the latest economic crisis), would be jeopardised.

Mittelstand has limited room for manoeuvre

In most cases, Germany's large global companies have a double advantage when reacting to the cost challenges of the Energiewende. First of all, thanks to years of experience in foreign business and export markets, they have a know-

ledge advantage. Therefore, it is easier for them to partially or fully offshore their production operations or to invest abroad in order to circumvent the high costs of energy at home. Secondly, these are the very companies that also have the possibility of generating electricity in Germany themselves – usually on site. Their generating capacities are based on both fossil fuels and renewables. The combination of captive generation and consumption can exempt them from several levies and taxes. For instance, they are generally not subject to concession levies, grid fees, cogeneration (CHP) or offshore levies.

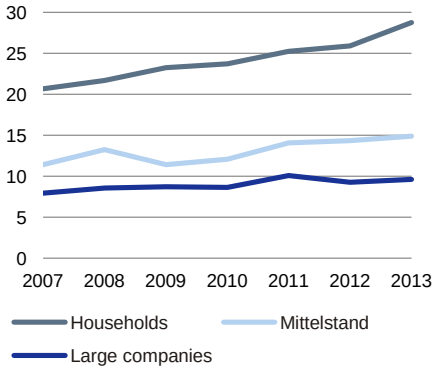
Furthermore, under certain conditions they pay no value-added tax, and plants that generate less than 2 MW are exempt from electricity tax. On balance – according to Prognos – the avoided costs of electricity purchases are now about twice as high as the foregone EEG remuneration for feeding electricity into the grid. Among the large-scale power consumers the levies are certainly equal to the purchase price of electricity.

Conversely, SMEs have often fewer options for adapting their business models via production abroad or captive energy supply, which is so far generally exempted from the EEG levy. This makes them more vulnerable to the rising costs of the Energiewende. The more electricity consumers are exempted from the EEG levy or other costs (e.g. grid fees) thanks to special arrangements and/or captive power generation, the higher are the costs to be borne by all the other users. The risk of a vicious circle developing is obvious. In this respect, the rising level of captive consumption also results in perceptible cost effects for the standard user base. Most of the "self-sufficient users" in Germany are by no means completely unreliant on the German grid. When there is no sunshine or wind, such consumers usually take up electricity from the national grid. But if a shrinking "standard user base" has to shoulder the rising system costs for an increasing number of captive users, this will be tantamount to an erosion of solidarity among power consumers. It makes economic sense that the self-sufficient users and not the standard user base be required to pay for their expensive grid connections. Furthermore, "taxing" captive consumption or charging a flat-rate grid fee could help ease the dilemma outlined above. This problem ought to be addressed immediately, as about 10% of the electricity generated in Germany today is in captive use.

The agreement recently hammered out in the coalition talks between the CDU/CSU and SPD to impose a minimum levy on new systems for captive use to secure the basic funding of renewable energy sources thus makes sense.

Electricity price on the rise 7

Germany, ct/kWh



Source: DB Research

Increase in EEG levy ought to be capped

The electricity prices charged to households and industrial users in Germany have jumped some 20% to 40% since 2007 and are now among the highest in Europe. Companies have to pay two and a half times as much for energy as their peers in the US. During the same period, the price quoted on the energy exchange in Germany has fallen by 60%. The main reason for the rapid increase in electricity prices is that over the past ten years Germany has invested approximately EUR 165 bn in the development of renewable energies. Renewables now account for roughly 23% of the power mix in Germany; their annual subsidisation has reached the EUR 20 bn level.

Germany's current energy policy aims to boost the renewables share in power generation to 35% by 2020. For this reason alone we calculate that well over EUR 100 bn in additional investment will be required. If subsidisation policy is left unchanged there is a risk of the EEG levy for all non-exempt users increasing to about 9-10 cents/kWh by 2020 (2014: 6.24 cents/kWh).

What the above suggests is that the looming electricity price hikes will remain a major threat to German industry. So in order to meet the 2050 target of 80% renewables in the power mix, the efficiency of the instruments will have to be boosted without delay.

The statutory priority given to feeding renewables-based electricity into the grid at fixed rates for 20 years was a reliable tool to drive the development of renewables in Germany. However, with the EEG levies apportioned to users now having reached EUR 20 bn per year, market-based components have to be introduced or reinforced in order to curb the electricity price increases they trigger. This should be done by gradually converting the subsidisation of renewables to the application of market-based price and volume mechanisms. In this context, we believe that the guarantees protecting existing plant should be maintained.

There is currently an option anchored in the EEG of a market premium model that could be relatively quickly made mandatory. Subsequently, all generators could be compelled to sell renewable electricity directly, e.g. on energy exchanges or else bilaterally. The financial gaps to a desired subsidy level would be compensated by a market premium. The market premia should be technology-specific and contain a sharply decreasing price mechanism (e.g. competitive bidding auction) to provide the incentive for a gradual transition to direct selling without government subsidies. Market premia would have to be able to adjust rapidly and flexibly and should follow variable development objectives (for example, if a previously fixed monthly installation volume were exceeded, the market premium would automatically fall to slow the pace of installation).

Another avenue would be to manage the installation of renewables capacities via an auction model based on the marginal cost principle (the supplier with the lowest generating costs gets the go-ahead). In this case, all renewables technologies would compete with one another for a fixed budget. As an intermediate step, technology-specific auction budgets could be established.

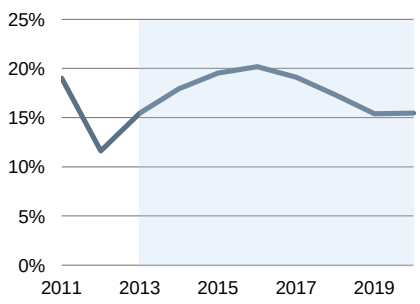
Going one step further, renewables capacities could be put to tender in the framework of tariff regulations for transmission and distribution grids. Investments in renewables capacities could flow into the "regulated asset base" and generate an "allowed return" specified by the government. The grid operators would have the incentive to select the cheapest supplier of a technology or of renewables capacities in general, since this would enable them to pocket additional returns exceeding the regulated level. Excess returns would be siphoned off in the subsequent regulatory period (and thus new installation costs reduced), as the government would lower the "allowed return levels" so the grid operators would be compelled to boost their cost efficiency.

Overview of the probable outcome of the coalition talks 8

Rapid, fundamental reform of the EEG; investment protection for existing facilities
Expansion corridor for renewables; cutback in over-subsidisation and scaling back of feed-in remuneration; review of exemption arrangements
Biomass: cap on new installation of waste and residue-fired plant
Wind: reduction of incentive rates for onshore facilities; concentration on windy locations; adjustment of expansion targets for offshore facilities
More direct selling especially for controllable renewables
Possibly a transition to tendering model from 2018
Captive generators: introduction of minimum levy
Security of supply: problem recognised, but concrete measures are still vague
Grid ought to be expanded in parallel with expansion of renewables
"National action plan for energy efficiency" should help tap the efficiency potentials e.g. in heating and transport sectors

Reserve Margin 9

Ratio of generating capacity to peak load



Source: DB Research

Reduction of exemptions from the EEG levy according to economic criteria

It seems that some of the measures outlined above could be found in the coalition agreement (see textbox). There appears to be a broad consensus on reducing the number of companies that are partially or fully exempt from the EEG and/or grid levy. We support the concept of distributing a growing subsidy burden across a broader base in order to further limit the rise in renewables subsidies borne by the (non-exempt) standard user base. In our opinion, when the exemption arrangements are reviewed only companies that face international competition and are major users of electricity (both large industrials and Mittelstand) should remain exempt from the levy; the other companies, by contrast, ought to be reintegrated into the levy system. Moreover, greater importance is likely to be attached to market principles in any future efforts to promote renewable energies. Fundamentally, the over-subsidisation of certain renewables

should be cut back; this is urgently necessary and a measure we would endorse. On balance, though, the measures expected to be implemented by the new government will at best only help to curb the increase in electricity prices going forward. This suggests that the cost debate is going to continue.

Utilities reaching their limits?

Energiewende 1.0 has so far mainly led to burdens on the conventional power utilities. The low marginal costs of renewables and their priority feed-in weigh on electricity prices on energy exchange. Conventional generating capacities have to be run down during windy and/or sunny periods, which lowers their annual average load factor and profitability. As a result, we estimate that about one-third of the conventional power generating capacity in Germany is operating in the red since the electricity market is reeling from a huge oversupply of capacity – due not least to the unbridled expansion of renewables. The excess capacity (expressed by the "reserve margin", i.e. the ratio of generating capacity to peak demand for electricity) is set to continue climbing steadily to a level of about 20% until 2016, even though 8 GW of nuclear capacity was taken offline in 2011/12.

Demand for electricity has fallen about 10% short of forecasts since the credit crunch in 2008/09. Even though we predict that the economy is going to pick up, this demand is nonetheless not likely to stage more than a below-average recovery – the reason being rising efficiency requirements. At the same time, we look for a strong increase in the installation of conventional and renewables-based generating capacity: 6-7 GW of conventional capacity (8% of peak demand) are currently under construction. We estimate that 25-35 GW of new renewables capacity will be installed by 2020, while Germany's winter reserve capacity legislation will severely hamper the closure of loss-making plants.

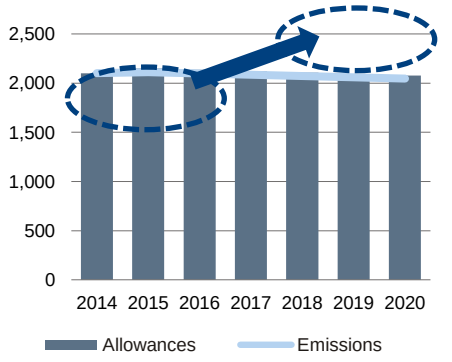
From the aspect of security of supply, a growing oversupply of generating capacity puts Germany in a comfortable position. From the vantage point of the conventional utilities, by contrast, this represents billions of euros in sunk costs in no-longer profitable generating capacities. Expanding capacities prevent an urgently needed (from the utilities' point of view) recovery of electricity prices on the energy exchange and of existing plant utilisation, and exert substantial pressure on earnings which results in serious balance sheet problems.

The winter reserve legislation seriously impedes the mothballing of unprofitable generating stations, since this requires the approval of the Federal Network Agency (BNetzA). The legislation is valid for a limited duration and set to expire in 2017. Until then it will raise the security of supply (the BNetzA will not permit any shutdowns that could jeopardise the security of supply). Subsequently, however, consideration must be given to a possible revamp of the electricity market, so that currently “unprofitable” gas-powered generating stations will be available as reserve capacity in future to compensate for volatile renewable energies. We suggest that the period until 2017 should be used to think about structures for introducing some type of capacity mechanisms to prevent rent-seeking effects. Such mechanisms would, in turn, provide relief for the utilities' balance sheets.

Sense of proportion needed in carbon market reforms

Parallel to the discussions on the Energiewende in Germany there have been considerations at the EU level over ways to achieve a structural reform of the EU emissions trading system (EU ETS). The debate is set against the background of a currently huge excess supply of carbon allowances in the system. According to European Commission estimates, the excess totals roughly 2 billion allowances, which corresponds to the annual emissions of all the industries participating in the EU ETS. The main reason for the oversupply is the generous allocation of allowances that has built up over time. Furthermore, the persistent economic crisis in Europe has gone hand in hand with fewer carbon emissions (and thus with less demand for allowances). In addition, the flow of international credits from climate protection projects into the EU ETS has outstripped expectations over the past few years. Barring structural reforms, the excess supply would remain in place during the third trading period of the EU ETS, which lasts until 2020. Owing to the excess, the price of carbon has traded at historical lows for months; it is currently less than EUR 5 per tonne. Some political camps argue that this price level is not sufficient to stimulate investment in low-carbon technologies – and worse, has encouraged the use of carbon-intensive sources of energy, like coal and wood, in recent years. This is why they say the instrument needs to be reformed. Nonetheless, the targeted carbon reduction objective for the participating plants will be met.

Backloading: 2013-15 allowances auction postponed until 2019-20 10

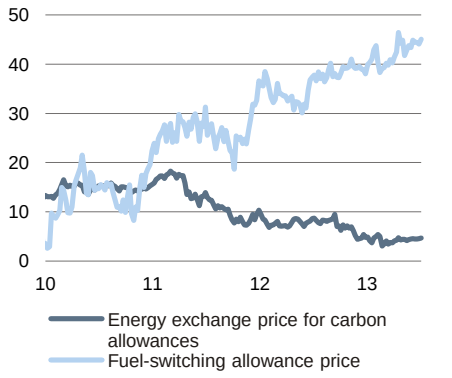


Source: DB Research

In order to revitalise EU emissions trading (and at least stabilise the carbon price as a consequence), the EU is seeking to postpone the auction of 900 m allowances planned for the 2013-2015 period until 2019-2020 (referred to as "backloading"). The CDU/CSU and SPD appear to have reached agreement in their current coalition negotiations on supporting the EU backloading plans. From our standpoint, however, the market would nonetheless still be structurally oversupplied, which would limit the policy makers' hoped-for increase in the price of carbon. To stimulate the politically desired switch in power generation from coal to natural gas via the EU ETS, carbon prices would now need to trade at roughly EUR 40 per tonne. Given the current circumstances, though, such a price is unrealistic (and it would also lead to significant increases in the price of electricity).

Carbon price compared with required fuel-switching price 11

EUR/tonne of carbon



Source: DB Research

Further-reaching structural reforms proposed by the European Commission[1] that would lead to permanently higher carbon prices are currently a subject of political debate. Examples of these structural measures include a general tightening of the carbon supply via stricter emission reduction targets and/or the permanent retirement of allowances from the EU ETS.

In our opinion, politicians should refrain for the time being from supporting any further measures of this type as long as levies and duties resulting from other instruments such as the EEG continue to have a substantial impact on electricity prices. After all, markedly higher carbon prices would also lead to higher electricity prices, which could further exacerbate the competitive disadvantages in Europe vis-à-vis the US.

Lars Slomka (lars.slomka@db.com, +49 69 910-31942)
Josef Auer (josef.auer@db.com, +49 69 910-31878)
Alexander Karnick (alexander.karnick@db.com, +49 69 910-31945)

[1] For details of these proposals see European Commission (2012). Report from the Commission to the European Parliament and the Council. The state of the European carbon market in 2012. Brussels.

Printed by: HST Offsetdruck Schadt & Tetzlaff GbR, Dieburg

Print: ISSN 2198-1337 / Internet/E-mail: ISSN 2198-1353