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Summary of the position paper

Incorporating the German Energiewende into a comprehensive European approach

New options for a common energy and climate policy

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In its 2010 Energy Concept, and in following decisions, the Federal Government of Germany sets a series of targets for the energy transition better known as *Energiewende*. The exact relationship and balance between these targets is, however, controversial. Depending on the benchmark target chosen, the assessment of energy policies varies dramatically.

Accordingly, the Federal Government's independent expert commission for the monitoring process "Energy of the Future" has identified two overall objectives for the energy transition: the reduction of greenhouse gas emissions by at least 80 percent by 2050 and the phase-out of nuclear energy by the end of 2022.

The present position paper therefore assumes that the ultimate goal of the German energy transition is climate protection. However, only a sufficiently large alliance of states will succeed in reducing global emissions. Since the European Union plays a central role in such a scheme, this paper focuses on European energy and climate policy. Furthermore, it outlines options for the expansion of the European Union Emissions Trading System (EU ETS), for harmonising renewable support schemes across Europe, and for the strengthening of the internal electricity market.

Position paper

Expansion and revitalisation of the European emissions trading system

With the EU ETS, the European Union has already established a cost-effective instrument for reducing greenhouse emissions that can be linked with other climate policies at the global level. These are the necessary means to pave the way for a coordinated global action that can effectively tackle climate change.

European Union Emissions Trading System (EU ETS)
Within the framework of the ETS, the EU periodically specifies an upper limit to greenhouse gas emissions and then issues an appropriate number of emissions allowances (currently in Phase III, 2013-2016). An increasing number of allowances is auctioned off and the rest is freely allocated (2013: 40 percent auctioned off; 50 percent designated for 2013-2020). In this way, a solid half of European emissions will be covered, primarily from electricity generation and energy-intensive industries. Allowances can be freely traded. On the basis of supply and demand, the market thus determines the price of a ton of saved carbon dioxide. This aims at creating incentives to reduce the emission of harmful greenhouse gases where it is economically most cost-effective and efficient. The current value of seven Euros/ton (January, 2015) is significantly below the 2011-value (13-17 Euros/ton).

However, companies regulated by the ETS must be able to rely on the continuing stability of the system. They may otherwise withhold investment in abatement measures as well as in research and development. By committing to the goal of reducing greenhouse gas emissions across Europe by 2030, the EU member states have taken an important step towards ensuring this stability.

The ETS can be expanded and made more effective through additional measures: In comparison to the currently envisaged Market Stability Reserve, a **price corridor,** comprised of a price floor and ceiling for allowance auctions, would provide greater long-term price stability for market participants, stabilise expectations and encourage innovation. Together with an increasing number of auctioned allowances, the price corridor would lead to increasing revenues from the ETS, which could be used for additional climate protection measures. The price floor would furthermore prevent national policies from undermining the ETS by keeping prices for emissions allowances from dropping below the prescribed level.

EU climate and energy goals for 2030
- Reduction of greenhouse gas emissions by at least 40 percent (based on 1990 levels)
- Increasing the share of renewable energy to at least 27 percent
- Increasing energy efficiency to at least 27 percent

If national **support schemes for renewable energies** were simultaneously and gradually reduced, renewables would compete with other technologies covered by the ETS based on their potential to cost-effectively reduce greenhouse gas emissions. However, due to different national preferences with regard to funding programmes and long-term energy policy strategies, it is not likely that states will cut funding completely. Therefore, the focus should be on minimising both the undermining effects of support schemes on the ETS as well as efficiency losses.

The **extension of emissions trading to other sectors of the economy,** such as transportation, private households and the agricultural sector, could unlock further potential for innovation. In addition, a larger market for emissions reductions could entail considerable improvement in efficiency due to different abatement costs between sectors. Overall economic costs would decrease, since emissions would be reduced in those sectors where the economic advantage of a reduction is highest. Altogether, an extended ETS could steer European greenhouse gas emissions more effectively.

Regarding **global climate protection,** the EU ETS should be harmonised with other emissions trading systems in order to create incentives for investment in abatement technologies. Third countries could be offered transfer payments to induce them to join the EU ETS.

Market-oriented support for renewables in the EU

If EU member states do not yet succeed in further promoting emissions trading, a gradual transition could be achieved through **an integrated European approach on renewable support.** It can be designed as a phased plan, including pilot projects and the incremental adjustment of national policies.

Renewable Energy Directive
In order to promote renewable energies in the EU, the Renewables Directive was enacted in 2009 and stipulates the following common regulatory framework: By the year 2020, 20 percent of the final energy consumption of the EU should be covered by renewables. The Directive sets various targets for each EU member state, taking into account their respective conditions and economic potential. An overview of the current promotion and use of energy from renewable resources in the EU member states can be found in the progress report "Renewable Energy" (2013) by the European Commission.

The harmonisation of the European support schemes is already laid out in the EU Renewable Energy Directive. It specifies that member states may reach their national targets for expanding renewable energies domestically or via statistical transfer, joint projects, or collaborative funding schemes.

With the **EU support programme for low carbon energy demonstration projects (NER 300),** the EU has established a regulatory framework that could be further expanded upon and used in order to reduce costs of technologies that come with high administrative barriers, such as large thermal solar plants. For market integration and cost effectiveness to be guaranteed, renewable support should exploit **competitive advantages** in the EU and ensure a **technology-neutral** promotion. Thus, the expansion of renewables in Germany would prospectively fall short of the German Federal Government's current development targets, in favour of an expansion at more suitable sites in Europe (for example southern Spain as a site for solar plants).

A harmonised European support programme for renewable energies would contribute to reducing the costs of national support schemes and boost the internal market integration of renewables. This strategy, however, does not meet the requirement for an effective as well as cost-efficient tool for climate policy. It can serve as a transitory solution, but does not provide a viable long-term alternative to emissions trading.

Strengthening the internal European electricity market

The restructuring of the energy system in Germany and Europe also presents new challenges to the internal European electricity market. Market integration of renewables is a basic requirement for strengthening the internal electricity market. In addition, renewables need to be physically integrated into the energy system. For an effective expansion of transmission and distribution grids, it is vital to know to what extent, at what speed, and above all in which regions of Europe there will be an increase in electricity generated by renewable energies.

In order to enable investors to consider all relevant costs within the power system when selecting sites for electricity generation capacity, a variety of measures are necessary. Here, too, a step-by-step approach could guarantee supply security at the national level until more efficient measures at the European level are completely implemented. Interventions from grid operators such as so-called re-dispatch mechanisms could further serve as an appropriate ad-hoc measure.

Re-dispatch mechanism
The term "dispatch" refers to the planning and scheduling of power plants executed by the power plant operator (dispatch = power plant deployment planning). Re-dispatch on the other hand implies a short-term change in the operation of power plants at the transmission system operator's request in order to limit grid bottlenecks.

The next step towards strengthening the internal electricity market could be to **optimise the selection of sites for electricity generating capacity.** Electricity price signals have to be adjusted accordingly. Germany, for example, has a single national price area. This can be a problem, since national electricity prices do not reflect power shortages in specific regions. A so-called "market splitting" could be applied here, dividing the electricity market into regional price areas. Supply shortages, for instance in southern Germany, would be reflected in higher prices.

Another important measure is the further development of **grid tariffs,** paid by electricity producers for the transmission of electricity. Currently, the tariff levels are determined regardless of the distance over which the electricity is transmitted. The introduction of an additional distance-based charge, the so-called "G-component", could include electricity producers into grid-expansion schemes. The level of the charge could be differentiated by

Market splitting
"Market splitting" means the splitting up of electricity markets into regional price areas. This mechanism provides the possibility to eliminate structural bottlenecks in the grid and to reduce intervention in grid operations. A good model of this is the Scandinavian power market "Nord Pool Spot."

region, so that producers would pay lower tariffs in regions with higher demand than in areas with less demand.

Such measures would create incentives to locate generating capacities in regions where energy supply is less stable, thereby reducing the necessary extent and cost of grid development.

In addition to grid expansion in Germany, it is also necessary to **expand transmission and distribution grids across Europe.** The aim here is to reduce obstacles to large-scale transportation of electric energy (the so-called "European copperplate" refers to a high transmission capacity of electricity through Europe), in order to enable as many market transactions as possible in a uniform, Europe-wide energy-only-market. In this scenario, states would surrender more autonomy and autarky in terms of energy supply. In the medium- and long-term, the construction of a high-voltage direct current super grid (HVDC) is imperative. This would generate more efficiency gains through the internal market and support the expansion of renewables across Europe.

Energy-only-market
In an energy-only-market, power plant operators only receive compensation for the amount of energy provided (power production). So far, there is no remuneration for the provision of power plant capacities to be made available on the electricity market if required (capacity market).

As an alternative, a **cost-oriented approach** is discussed, aiming at keeping down the costs of expanding both the transmission and the distribution grids. However, a cost-oriented expansion of the power grid cannot offset fluctuations in generation and consumption across all of Europe. This approach would also depart considerably from the current model, where all market transactions are permitted and all renewable energy facilities feed in the maximum possible energy load at all times. If grid expansion fails to keep pace with the expansion of renewables, there is a risk of supply shortages. A European re-dispatch mechanism and market splitting into transnational price areas could reduce this risk.

Recently, there have been discussions on whether it is necessary to establish a mechanism to secure sufficient electricity generating capacity in the medium- or long-term (a so-called **capacity mechanism**). Here, the question is what price peaks an electricity wholesale market operating at the limit of its capacity is able to shoulder; another question is how reliable the investment signals suggested by such price peaks are. If price peaks occur frequently, it would point to relatively scarce power supply in relation to demand at that point in time. Accordingly, high prices would create incentives for market participants to invest in the creation of new generating capacities. However, the wholesale market of continental Europe has not yet experienced any critical accumulation of such price peaks, not even in times of low feed-in rates from renewable energy plants. For this reason, it can be assumed that the system is currently experiencing overcapacity. Hence, a commitment to a capacity mechanism would clearly be premature and should not be considered for now.

Evaluating reform options in the context of European law

All measures and policies must take into account European and national regulatory frameworks, since legal certainty is a fundamental prerequisite for investment in climate-friendly technologies. From a legal perspective, the reform options delineated here can safeguard legal certainty and even resolve discrepancies between European law and national renewable support schemes.

An overview of important reform options

Europeanising the energy transition

Expansion of the Emissions Trading System (ETS)
The extent to which the ETS can contribute to climate protection depends on the member states' willingness to further develop the system as the EU's main instrument for climate policy. This paper therefore proposes the following measures:

- Setting a price floor and ceiling for emissions allowances (price corridor)
- Cutting back national renewable support schemes in order to promote renewable energies through the ETS
- Extending the ETS to all relevant greenhouse-gas-emitting sectors (e.g. transportation, agriculture and private households)
- Linking the ETS with the emissions trading systems of other regions, or integrating non-EU states into the ETS

Market-oriented renewable support in the EU
Even if the EU member states fail to reach an agreement on a comprehensive ETS reform and thus maintain potentially ineffective national policies and incentives, the European Union should, nevertheless, continue negotiations for such an agreement. In the period of transition preceding an agreement, EU energy policy should not be fragmented any further by an expansion of national support schemes. Instead, a comprehensive European renewable energy promotion could be implemented gradually by the following measures:

- Harmonising European support schemes for renewables
- Supporting European pilot projects, especially for technologies with major administrative barriers
- Ensuring a technology-neutral promotion and exploiting competitive advantages in the EU

Strengthening the internal electricity market

Integrating renewables into the market and energy system
The transformation of the energy system confronts the European internal electricity market with new challenges. Together with the necessary economic market integration, the integration of renewables into the electricity system's architecture is a basic requirement for strengthening the internal electricity market. The following measures can help to achieve this:

- Optimising the selection of sites for electricity generating capacities by restructuring both price areas for electricity and network tariffs at the European or, alternatively, at the national level
- A massive expansion of the European transmission and distribution grid or, alternatively, a cost-oriented approach

Academies' Project "Energy Systems of the Future"

The position paper "Incorporating the German Energiewende into a comprehensive European approach" was drawn up in the Academies' Project "Energy Systems of the Future". In a first step, eight working groups (WGs) pooling expertise and know-how identify relevant problems. Interdisciplinary ad-hoc groups then proceed to work out according policy options. The present position paper was developed by the ad-hoc group "Integration".

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