Market-oriented and pragmatic: The energy transition needs a re-start

1. Preamble

Germany is on the threshold of a climate-neutral age. The proportion of electricity production from renewables has reached 60 per cent. The original version of the energy transition will, however, not be equal to the task of completing the rest of the path towards climate-neutrality. Rather than basking in the success of past achievements, we need an "Energy Transition 2.0". A re-start that will get us to our goal.

The energy transition as we have experienced it in recent years has been characterised by a form of "planning mania". Too much regulation from "on high" has given many the impression that the focus is on ticking boxes rather than on the overall benefit. If "Energy Transition 2.0" is to have wind beneath its wings, the following is key: Keeping people in the forefront, taking their interests seriously, and responding constructively to hesitation or even resistance. Instead of letting the ministry bureaucrats take distrust as a starting point for their legislative activity, as happened with Germany's Building Energy Act (GEG), legislators in future must have the courage to provide more scope for freedom of application. Options for compliance must not be spelled out down to the tiniest detail. It is enough to set guidelines and enable everyone to make their own decisions as to which lane on the road to climate-neutrality is most appropriate for them. The great majority in our society wants to support this goal, but without administrative paternalism.

During the past 25 years, the energy transition in Germany has helped to create well over 15,000 legal standards1 that both burden and call into question the achievement of the trio of energy policy targets, i.e. security, affordability and climate-neutrality. It's high time we returned to a "Point Zero", from which over-complicated regulations can be streamlined and turned on their head. That doesn't mean taking a chainsaw to it all, but it does mean having a German Energy Code that unambiguously defines what is wanted at every level of a hierarchy of targets with no enforcement conflicts and addresses these, if even necessary, with lean and transparent support. The European emissions trading scheme (ETS) does not simply run alongside this. Quite the opposite: It is the central, all-encompassing market mechanism for achieving the desired climate-neutrality. It's the starting point and the guiding tool for recognising the most economical form of energy generation in Europe.

Affordable power determines the willingness of companies to invest and motivation at an individual level. Local energy projects prove their worth based on the benefit for those affected. An energy system that rewards flexibility of supply and demand more than is currently the case is best placed to create added value for everyone. Energy Transition 2.0 is not a project for some time in the future. The message of climate change is that the time for a re-start is now.

[1] See BBH Group overview "Normenvielfalt im Energiesektor" (Multiplicity of standards in the energy sector), September 2021

2. Keep up the pace for long-term targets, and become adaptable along the way

The long-term climate protection goals should not be questioned. This applies in particular to the target set down in the Paris Agreement to limit global warming and the long-term EU goal of achieving climate-neutrality by 2050. The key factor is that these targets must be achieved in the most cost-efficient way possible.

To do that, the energy system must not be planned on the basis of ambitious goals but must instead be aligned along a realistic path.

Planning of the energy system in Germany is not currently needs-based but depends on energy policy targets. To avoid over-dimensioning the overall system and the networks, realistic scenarios are required, e.g. in relation to assumed electricity demand. That requires precisely reviewing the expansion of the network that is deemed necessary, and questioning it critically before costly decisions to expand the network are taken which turn out later to have been avoidable. Technology-specific targets for the expansion of renewables should also be critically reviewed in this connection (see Chapter 3). Needs-based expansion of this nature could quickly generate savings in the three-digit billion range for electricity customers in the next ten years alone.

All in all, a robust planning base for infrastructure development through to 2035/2037 is required, which will open up a range of options for the subsequent decarbonisation path. Electricity demand, for example, will depend on the speed of electrification of the transportation and heating sector and of the industry in general. This should take a range of scenarios into consideration.

Planning of the energy system must distinguish between capital investment in renewables and networks, which are profitable in any case, and investments that are necessary and practical only when certain developments can be reliably expected to take place.

This will make it possible to adjust the way forward by the early 2030s, based on experience gathered up to that point, without incurring major investment costs that do not meet needs.

Recommendations

- Adhere to the Paris Agreement and long-term European climate objectives.
- Critically question assumed demand for electricity in the energy system planning process and make corrections to expansion plans for renewable generation and infrastructure.
- Draw up a robust infrastructure scenario and enable adjustments at the beginning of the 2030s.

3. Allow the EU ETS to function, bolster liquid energy markets and security of supply as preconditions for the transition

A main instrument used for climate protection is the market for emission certificates. This market uses a price signal to ensure cost-efficient decarbonisation. Once Germany has made far-reaching progress in decarbonising the electricity sector, decarbonisation of the transportation and heating sector must take priority during the following years. A strong carbon price signal that can be anticipated with enough confidence will bring about rapid change and result in the selection of the most cost-efficient option in each case. In many cases, this will mean electrification, based on where we currently stand. Green or low-carbon gases and remote heating solutions will be considered as alternatives in some cases. There is, however, no need for detailed technological requirements which could have a complementary, redundant or even conflicting effect on the carbon price signal.

This also applies to excessive regulations governing individual technologies such as the European definition of green hydrogen. These contribute nothing to decarbonisation but simply increase the costs. In the worst case, they will stifle the market for green hydrogen before it even comes into being. The German government should therefore campaign vigorously at a European level for a revision of the legislative act in question.

Liquid energy markets are a necessary precondition for a successful transformation of the German electricity system. That's the only way that consumers and producers can physically and financially protect themselves. Liquid markets must be well designed, but the price signals from liquid markets must also be approved in order to have an effect. And, of course, liquid markets can only come into being when there is sufficient supply.

The current high level of market liquidity in Germany can be maintained only if the unitary German electricity price zone remains in place. A split in the market would make hedging transactions noticeably more difficult for industry, sellers and generators, with a decline in market liquidity and more volatile electricity prices as a consequence. To keep redispatch costs within limits, the expansion of transmission routes from northern to southern Germany needs to proceed at a faster pace. Ensuring new power stations, battery storage facilities, electrolysers and renewables are located close to the grid also makes sense.

In addition to a unitary German price zone, free markets for gas, hydrogen, carbon and electricity are also essential. Interference in these markets undermines investor confidence and the steering effect of market prices. Price peaks on electricity markets in particular incentivise the expansion of flexibilities such as load control or batteries, and are therefore also necessary.

Security of supply also requires clear responsibility and a price. The days when a sufficient volume of assured capacity could be assumed are over. In order to secure the exit from coal and to cover the process of further electrification, we urgently need an expansion in assured capacity here in Germany. In its most recent security of supply report, the German Federal Network Agency assumes a needed expansion in the order of 17 to 21 GW. Given the time pressure for the necessary expansion, a call for tenders will have to be made for the addition of new gas-fired power stations (the power station strategy). Here, too, grid aspects must be

taken into consideration when calling for tenders, especially the impacts on redispatch requirements, to ensure that consideration is given to locations in the grid-connected south in particular. These calls for tender should be as simple and as pragmatic as possible. In the long term, a central capacity market on the Belgian model is the best tool for addressing and pricing security of supply, given that it is technology-neutral and is open in particular to flexibility providers.

Recommendations

- Place the EU ETS at the forefront of climate policy. Import national fuel emissions trading into the EU ETS 2 promptly.
- Issue prohibitions and subsidies to reduce emissions only in justified exceptional cases.
- Reform and greatly simplify the European definition of green hydrogen.
- Maintain a unitary German electricity supply zone.
- Clarify a pragmatic tender process for new gas-fired plants with the European Commission and pass a pragmatic power station security law in the short term.
- Create a technology-neutral, central capacity market by 2028 on the Belgian model.

4. Encourage market rationality in order to expand renewables cost-efficiently

To ensure the further expansion of renewables is cost-efficient, the Renewable Energy Act should be replaced by a new set of market regulations.

Three challenges must be addressed here:

(1) Synchronise grid expansion and the expansion of renewables

In future, renewables should be expanded primarily in locations where they will incur the lowest additional system costs, especially with regard to the expansion of infrastructure. The appropriate economic incentives must be created for the various technologies in this regard. In particular, the expansion targets for offshore wind are too high at 70 GW, and should be adapted in order to avoid inefficient and costly construction (including shading and dimensioning of grid connections). Specifically, the costly expansion of the “Duckbill” area of the North Sea must not go ahead. Developers of offshore wind turbines should also assist with the grid connection costs (in the form of a contribution to building costs), to create incentives to save system costs (e.g. by overbuilding wind farm capacity compared to the grid connection). For onshore wind and PV, incentives can also be created via a regionally differentiated contribution to the grid expansion costs (traffic-light system, see Chapter 6).

(2) Ensure long-term hedging for investments in renewables

The further development of renewables must be on a market basis, combined with battery storage systems via self-managed marketing or long-term supply contracts between generators and the industry, known as PPAs. Financial hedging for investments in renewables must also continue to be available. Instead of the current guarantee prices (grid feed payments) for generated electricity, a mechanism is needed that will take effect right when the investment decision is made. To achieve this, the Federal Network Agency should tender financial CfDs in the form of capacity payments with a production-independent refinancing contribution in line with demand, while taking account of available grid capacities (see Chapter 6).

(3) Encourage feed-in behaviour in line with market principles by generators of renewable energy

Smaller generators must also take part in the market through the agency of service providers, known as aggregators, and no longer receive fixed grid feed payments (with particular reference to rooftop PV systems). Remuneration would no longer be provided for hours in which electricity prices are negative.

Structuring the CfDs as a capacity payment with a production-independent refinancing contribution (see above) also provides an incentive for behaviour in line with market requirements.

Recommendations

- Review existing technology-specific capacity targets in GW for the expansion of renewables. In particular, the costly expansion of the "Duckbill" with offshore wind in terms of system costs must be questioned.
- Instead, align and auction the expansion of offshore wind, taking realistically achievable wind revenues in TWh as a target. The offshore wind legislation must be amended accordingly. Grid capacity may be lower than the installed offshore capacity.
- Scrap fixed grid feed payments for new plants under the Renewable Energy Act and replace them with self-managed marketing and no remuneration for hours with negative electricity prices.
- Support the expansion of renewables with financial CfDs in addition to market signals.
- Replace the reference revenue model to support low-wind locations with economic incentives to encourage an efficient expansion of renewables in the grid.

5. Use the potentials of flexibility to the full through digitalisation and good market structures

In an electricity system increasingly dominated by renewables, we need more flexibility on the demand side. This flexibility helps to prevent critical shortfalls in supply that arise through fluctuations in electricity generation from wind and solar energy. Electricity shortages and surpluses must be reflected via price signals. In the long run, this flexibility can also help to make better use of the capacities in the grid and thus reduce costs.

The use of smart meters is a precondition for enabling consumers to respond to price signals. The rollout of smart meters must therefore be simplified and also be more targeted in locations where the benefits to consumers are the greatest. As a result, the installation of smart meters will be at least cost-neutral to consumers, since they can leverage the value of flexibility via lower procurement costs.

This will release new demand dynamics and enable the urgently needed expansion of digital infrastructure to be advanced. The rollout of smart meters must also be systematic to ensure gains in both pace and efficiency. It should therefore be made the sole responsibility of the distribution system operators.

Aggregators have an important role as intermediaries to enable the system to accommodate micro-flexibility. Regulatory changes are therefore needed to allow these business models to develop and to leverage the system benefits of decentralised flexibility. Monetary incentives are needed to counter local shortfalls in the grid through flexible behaviour on the demand side. Flexible consumers must be able to reduce their power bills significantly. The full benefits of this potential can be enjoyed only if grid fees are charged on a capacity basis in future. The extent of the fees must therefore be aligned with demand for peak load in the grid (determined ex ante), not on the volume of electricity drawn from the grid. This also satisfies the principle of cost reflexivity. Alternatively, for a transitional period, models with reduced grid fees for grid-friendly behaviour could incentivise greater flexibility. In general, levies and apportionments as well as grid fees should be structured to ensure that incentives for flexibility marketing are not distorted.

The model of market-based redispatch can also be used to leverage flexibility potentials on the demand side and reduce the costs of redispatch.

Recommendations

- Distribution system operators must be responsible for the smart meter rollout. The process can be structured using business models for flexibility to make it cost-neutral, so the smart meters can be made available for these consumers with no additional burdens.
- Switching the grid fee system to capacity-based billing can achieve the greatest benefit from monetary incentives for providers of micro-flexibility. Well-designed market structures must also be developed here, to enable aggregators to integrate this flexibility into the system.

6. Reduce system costs through efficient use and expansion of the power grid

To ensure that the energy transition is affordable, system costs must be reduced through more efficient use and expansion of the power grid. Specifically, this means the following:

- **Adding renewables without alignment with the grid cannot continue as at present. In future, signals will be needed for choice of location that take the situation of the grids into account.** Various tools come into question here, e.g. grid "traffic lights" in the distribution system. These reflect current and future grid status in stages from green to red, and should therefore be aligned with grid expansion plans in the distribution system, which also reflect municipal land use planning for renewables and additional consumers. The grid connection will take longer when the lights are yellow and red. In addition, a greater share of the grid expansion costs should be for account of the investor when renewable capacity is added in a yellow or red grid area. Similar mechanisms can also be introduced for the addition of battery storage systems and additional loads. The result is a powerful steering effect in the direction of lower-cost locations from a grid perspective.
- As an additional action, **it should be possible to overbuild grid connection points.** In most cases, PV and wind do not feed into the grid connection point at the same time. If they were connected to the same grid connection point, they would improve the efficiency of the existing infrastructure, substantially increasing the use of the grid connection point, and more than doubling it in some cases. Together with participation in the grid connection and expansion costs, this will create incentives for plant operators to reduce the connected load rather than continuing to set it at 100 percent of installed capacity.
- Expansion of this plan involves the following elements:
    - The **feed-in socket** allows connection requests to be pooled through the proactive provision of grid capacity by the grid operator.
      Allocation when grid capacity is tight is based on transparent criteria in line with system benefit and costs. In return, plants receive a faster grid connection, do not have to participate in grid expansion costs, and may also receive additional bonuses.

- **Simple, standardised and digital queue management** allows systematic and transparent prioritisation of grid connection requests by grid operators based on clearly defined criteria, but must not result in excessive complexity and bureaucracy. A substantial reservation fee, which is credited when the project is realised and otherwise forfeited to reduce the grid fee, could help to reduce the number of non-binding or pointless grid connection requests and achieve the desired queue management with no additional red tape.
- **Switching from underground to overhead cables** will enable grid expansion to take place more cheaply and quickly. Overhead wires are easier to install and maintain.
- Existing efficiency comparisons used in grid regulation should be applied across the board. Greater consideration should be given to potentials for saving costs that can be identified from comparisons at a European level for the connection of large-scale plants.

Recommendations

- The choice of location for renewables plants, battery storage facilities and new switchable loads must better reflect grid criteria.
- Priority should be given to connection in identified regions.
- In addition, optimisation is needed in terms of economic efficiency (overbuilding or cable pooling).
- Efficiency comparisons in grid regulation must be applied across the board and savings potentials in technical installation must be leveraged.

7. Focused and pragmatic ramp-up of H_2 and CCS

The H_2 ramp-up has been proceeding less dynamically than was expected after the Russian attack on Ukraine. H_2 remains a relatively costly option for decarbonisation. This is due largely to the unnecessarily high regulatory barriers to generating “renewable” and “low-carbon” H_2. Firstly, work should be done on these framework conditions (definition of green hydrogen at EU level, leveraging flexibility potentials in integrated energy). The long-term goal should be for the hydrogen market to develop independently following the ramp-up phase based on price signals from the EU ETS. Further-reaching support is needed during the ramp-up phase, however. The current electrolyser expansion targets should be cancelled.

More use must be made of three key tools here:

1. Quotas (green H_2 quotas in the transport sector/refineries in accordance with the Renewable Energy Directive and in other sectors with sufficient cost-bearing capacity),
2. Lead markets (e.g. in the area of public procurement),
3. To a very limited extent, CfDs, which bring together domestic supply and demand and take account of the infrastructure (project cluster financing, H_2 valleys).

To limit costs, there should be no distinction between the types of low-carbon hydrogen, and blue hydrogen in particular should play an appropriate part in view of its price advantages.

- To avoid both overcapacities and shortfalls, the structure of the core hydrogen network should be needs-based and not aligned with a maximum target.
- Carbon capture and storage (CCS) as a decarbonisation option is cheaper than the use of renewable or low-carbon H_2 in processes in which large volumes of CO_2 are continuously generated or emitted. In addition, some areas cannot be decarbonised by any other means (e.g. cement production). It is therefore important to create the **foundations for a well-designed CO_2 infrastructure**, including transport and storage systems, in good time in order to make it available to specific clusters of industry. Given the lengthy lead time for planning, approval and construction of the CO_2 infrastructure, a decision on the regulatory framework must be made at a national level in the short term on the basis of the EU Directive and the 2024 guidance documents. It is also necessary to draw public attention to the need for CCS and to campaign for acceptance. As with H_2, however, the process with CCS should also begin with investment in infrastructure only once the need has become apparent.

Recommendations

- Dismantle regulations for green hydrogen, scrap the current definition (especially at EU level) and replace with a pragmatic definition.
- Cancel the current electrolyser expansion targets.
- Bolster regulatory tools, especially quotas, lead markets and CfDs (project cluster financing).
- No discrimination between types of low-carbon hydrogen.
- Create a regulatory framework for the necessary infrastructure for the capture, transport and storage of CO_2 by passing the amendment to Germany's Carbon Capture and Storage Act (KSpG).